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JACQUES LOEB

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PHOTOCHEMISTRY OF VISUAL PURPLE.

I. THE KINETICS OF THE DECOMPOSITION OF VISUAL PURPLE BY LIGHT.

By SELIG HECHT.

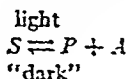
(From the Physiological Laboratory, College of Medicine, Creighton University, Omaha.)

(Received for publication, July 24, 1920.)

I.

An analysis of the progress of retinal dark adaptation in man has shown that the process follows the course of a bimolecular reaction (Hecht, 1919-20). The interpretation to be placed on these findings is that dark adaptation depends on the disappearance in the retina of *two* products of decomposition resulting from the photolysis of a sensitive material. This rests on the assumption that the sensitivity of the peripheral retina measured in terms of the threshold stimulus is directly proportional to the quantity of residual decomposition products then present in the retina.

A photosensitive substance undoubtedly exists in the irritable elements, and its decomposition by light must form the first step in the receptor process. It may be supposed that this sensitive substance breaks down into two products of decomposition; and that in the dark these two products reunite to form the sensitive material again. This reversible reaction may be expressed as



in which S is the sensitive substance, P is the principal precursor decomposition product, and A its accessory. Such a scheme has been shown to fit the facts of retinal adaptation, and to offer a starting point for quantitative investigations into the mechanism of visual reception (Hecht, 1919-20).

In terms of such an hypothesis of photoreception it would be a distinct step forward to be able to identify the three components of the reaction, and to discover their exact chemical interrelations. At present no definite statement is possible in this connection. However, dark adaptation is decidedly a phenomenon of dim vision. According to the Duplicity Theory, dim vision is associated with the rods of the retina. The rods contain a photosensitive substance known as visual purple. It is therefore *possible* that dim vision and, more particularly, dark adaptation are in some way conditioned by the properties of visual purple.

The association of visual purple with dim vision rests on more than the mere possibility just stated. A comparison of the threshold of visual sensibility at different wave-lengths with the spectral absorption of visual purple and its photochemical sensitivity has shown that these three sets of data resemble each other to a striking degree (Trendelenburg, 1911). It is similarly with the relation between dark adaptation and visual purple. A retina exposed to light is bleached. Placed in the dark, the intact eye or the retina alone with its pigment layer will regenerate the purple color. Under similar conditions the living eye becomes dark-adapted. The presumption is therefore that these phenomena are in some way correlated.

Our judgment in this matter must, however, be withheld, because no quantitative data are available with regard to the photochemistry of visual purple. Ever since Boll's (1876) discovery of this substance, and Kühne's classic qualitative investigations with it (Ewald and Kühne, 1878), there have been but a few scattered observations made with visual purple. A notable exception is the work of Trendelenburg (1904). It, however, has been barely a beginning.

It has therefore been necessary to investigate the visual purple mechanism from the modern point of view of photochemistry, and to attempt a complete analysis of the reactions concerned. The present paper is the first of a series in which the results of this investigation are to be presented. As a product of these researches, I hope to be able first, to decide whether visual purple is really intimately concerned with dark adaptation and the reception of dim lights, and, second, if it is so concerned, to determine precisely the way in which this is brought about.

II.

1. Thanks to the work of Ewald and Kühne, the preparation of visual purple is a simple matter. For my purposes the following routine has been adopted. Thirty frogs are placed over night in complete darkness. The next morning the heads are removed and placed in salt solution. The eyes are then enucleated, cut in two, and the retinas removed as free from the pigment layer as possible. This is much facilitated if the frogs have been kept over night in a warm room. The retinas with some salt solution are now placed in a centrifuge tube, and centrifuged at a good speed for 30 minutes. The supernatant liquid is removed, and a 3 to 4 per cent solution of bile salts is added to the retinas. About 5 cc. are usually added, but this may be varied up to 20 cc. depending on the concentration desired. The retinas are thoroughly stirred up, and are allowed to remain in suspension for half an hour or more. The mixture is then again centrifuged. This brings the disrupted retinas and stray pigment granules to the bottom of the tube, whereas the supernatant liquid is a clear purplish pink solution of visual purple. In this form it may be kept on ice for as long as a week or more without deterioration. It can be used directly or after dilution with water or bile salts solution.

All the manipulations are carried out in the dark, with the aid of the light from a 10 watt ruby lamp. This is hardly a source of error, because the solutions are quite insensitive to such red light. However, even to this light, they are exposed as little as possible. In considering sources of error it may be well to mention the purity of the bile salts. The commercial preparations are hopeless. The bile salts which I used were prepared in our own laboratory, and are a white powder, which when dissolved in water gives an absolutely colorless solution. Only such bile salts give reliable results.

A solution of visual purple prepared in this manner is extremely sensitive to light. If exposed to sunlight it loses its color in about a second. The solution, however, is not bleached to a completely colorless condition. The bleached solution is slightly but definitely yellow, and remains so no matter how long the exposure is maintained. In this I can confirm Trendelenburg (1904) as opposed to Ewald and Kühne's original statement (1878, p. 181) that the solu-

tion first turns yellow, and after some time turns completely colorless (*wasserhellig*). The discrepancy between the two observations I have not yet been able to explain.

The velocity of visual purple bleaching varies with the intensity; the rate may thus be controlled to allow a quantitative following of the process. With intensities near 100 meter candles the solutions may take half an hour to bleach. The purplish pink solution slowly loses its color, at the same time taking on a yellowish tinge, which increases and remains. The solutions obtained by the present technique do not show a reversible reaction. The bleached solutions retain their yellowish color in the dark for as long as they can be kept from bacterial decomposition. The conditions under which reversal takes place are different in several respects, and will be considered at length in future contributions.

2. The most obvious means of following the process is a colorimetric one. Unfortunately only a small quantity of material is available, and in dilute solution at that. A method has therefore been devised by means of which small amounts of solutions are manipulated accurately, and are made to produce the same optical effects as large quantities. The experiments are performed in very small test-tubes, made by sealing one end of short lengths of narrow bore glass tubing. The tubes are about 50 mm. long, and have an inside diameter of 2 mm., and an outside diameter of 2.5 mm. Each test-tube holds a little over 0.1 cc. This quantity of solution produces a depth of nearly 35 mm. Viewed end-on, the effect is produced of a solution of much greater concentration.

The crucial point is, of course, to have equal depths of liquid in all tubes of any given set of experiments. This is accomplished very simply. The test-tube is placed into a wider tube which fits it snugly. One end is sealed, and near the open end is a circular scratch. The inner tube rests on the bottom of the measuring tube. The solution is now inserted into the inner tube by means of a pipette having a long capillary tip, and the depth of the solution is so adjusted that the bottom of the meniscus is on a line with the circular scratch. This can easily be done within 0.2 mm., and, including slight variations in the thickness of the sealed end of the test-tube, would make the error in this part of the manipulation of the order of 1 per cent.

3. In order to follow quantitatively the progress of the bleaching reaction, it is necessary to have a series of colorimetric standards representing different concentrations of visual purple and its decomposition products. Eleven such concentrations are made up, representing on the one extreme 100 per cent of the unbleached substance plus 0 per cent of the bleached; and on the other extreme, 0 per cent of the unbleached plus 100 per cent of the bleached, the concentrations changing by 10 per cent steps. Actually these are made up in dry test-tubes by taking a total of 20 drops of solution: the first tube having 20 of the unbleached; the next tube 18 of the unbleached plus 2 of the bleached; the next 16 of the unbleached plus 4 of the bleached, etc. The same dropping pipette is used each time to insure uniformity.

The experimental unbleached solution is pipetted into the small exposure tubes. Into similar tubes and under the same conditions are pipetted the standard concentrations just described. The standards are jacketed with thick, black rubber tubing, except for a few millimeters at each end. In this way a much clearer end-on view is obtained. The exposure tube containing the experimental solution of visual purple is similarly jacketed when colorimetric comparisons are to be made. The matching is done against an artificial daylight lamp of 0.04 candle power, having a uniform circular surface 30 mm. in diameter. Such a light is sufficiently bright for work in the dark, especially after one has become dark-adapted. The matching light is turned on and off by a spring contact controlled by the observer's foot, so that only a momentary exposure is made.

When not in actual use the standards are kept under cover even in the dark room. As a rule, fresh standards are made daily. If they have been used but little, they may be kept on ice until the next day, provided they are placed in a moist atmosphere so as to prevent evaporation. They suffer comparatively little deterioration from their use, mainly because the exposures to the daylight lamp are so brief. After continuous use for several days, they are definitely off; hence the practice of making fresh standards daily.

4. The experimental tube is exposed to light of known intensity. The apparatus used for this purpose is shown full size in Fig. 1. The glass rod to which the exposure tube is attached is rotated by hand at a rate depending on the intensity of the light. For the experi-

ments reported in this paper this was roughly ten revolutions per minute. By this means an even exposure is obtained for this thin column of solution. This obviates the necessity for stirring the solu-

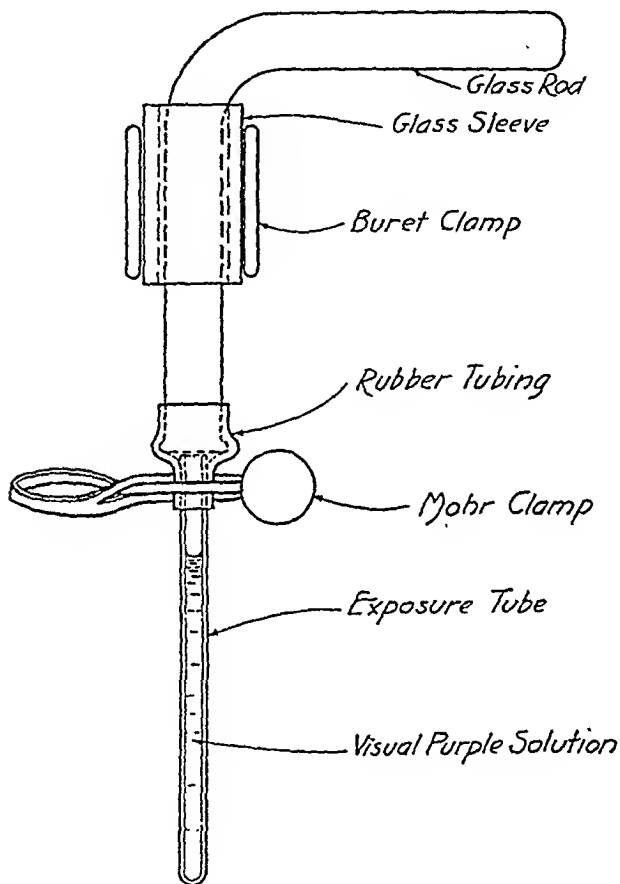


FIG. 1. Full size diagram of apparatus used for the exposure of visual purple solutions to light. The exposure tube being attached to the glass rod, it is possible to rotate the tube on its own axis by rotating the glass rod.

tion, and removes all errors associated with unequal illumination, diffusion, etc. (*cf.* Sheppard, 1914, p. 239). In this respect the small quantities of material and the thin test-tubes are of distinct advantage. After the proper length of exposure the light is turned off, the tube

removed, jacketed with the rubber tubing, and compared with the standards.

Readings are usually made to the nearest 5 per cent concentration. The reading is thus, say, 70 or 75 per cent. Occasionally, however, it is so clear that the color is nearly but not quite one of the 10 per cent tubes, that the reading is given between the 5 and the 10 per cent

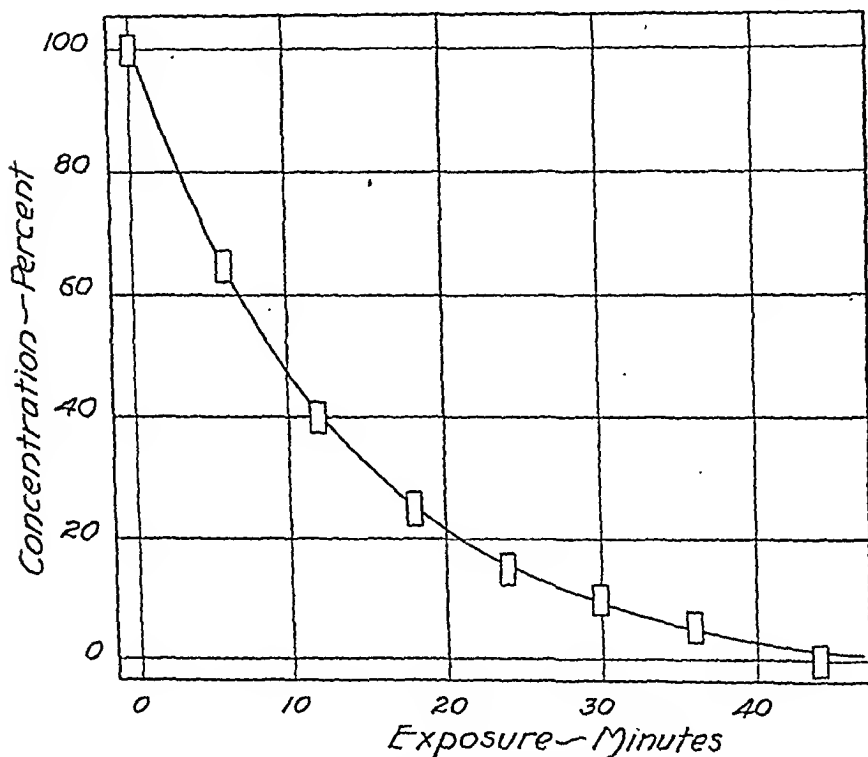


FIG. 2. The results of Experiment 80. Light intensity is 53 meter candles. The monomolecular nature of the bleaching process is evident from the coincidence of the experimental points (rectangles) with the curve calculated on the assumption that $k \approx 0.034$.

steps; for example, 48 or 52. This happens comparatively infrequently.

After a colorimetric determination the jacket of the tube is removed, the tube replaced, and the exposure renewed. After a sufficient exposure, the tube is again removed, and its concentration again determined. The process is repeated until the bleaching is complete.

III.

1. Altogether I have followed the progress of the bleaching of visual purple in 88 separate experiments. These have been performed under a variety of conditions to which reference will be made in the proper place. Figs. 2, 3, and 4 will serve as examples of what happens. They represent random samples of experiments performed so as to give

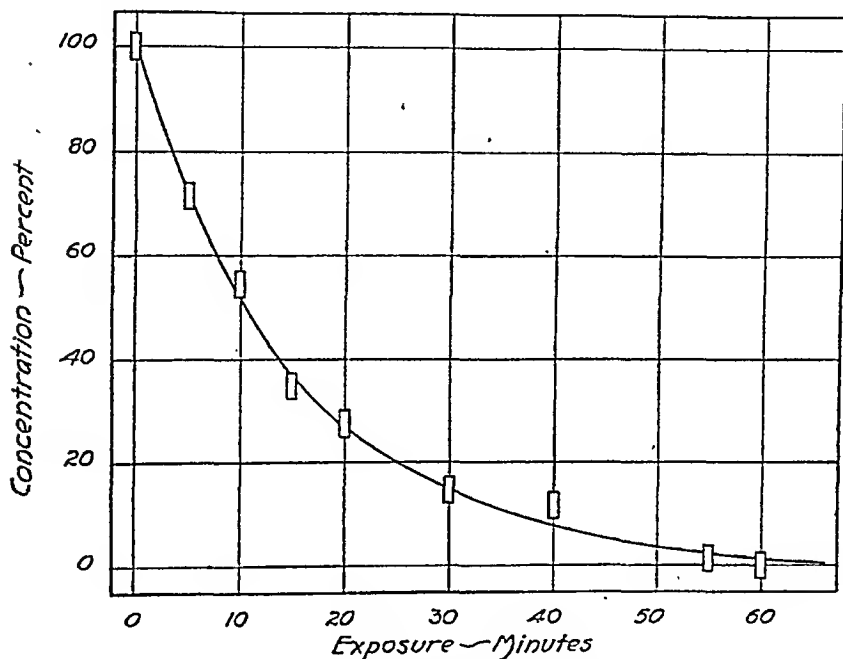


FIG. 3. Results of Experiment 42. Intensity, 28 meter candles; $k=0.028$.

different velocities of decomposition, and are quite characteristic of all the other experiments.

In the figures the readings are plotted as rectangles, on the assumption of an error of 5 per cent in the determination of the concentration, and 1 minute in the control of the exposure. The curves are isotherms of a monomolecular reaction

$$k = \frac{1}{t} \log \frac{a}{a-x}$$

in which a is the original 100 per cent concentration, and $a-x$ the per cent of material still unbleached. It is apparent that the experimental results follow the curves pretty well.

To show this in the usual way Table I is given presenting the results of a fourth experiment. It will be observed that the values of the velocity constant k are fairly constant. This uniformity is particularly striking if two things are kept in mind: first, that the measurements are single determinations only, not averages; and, second,

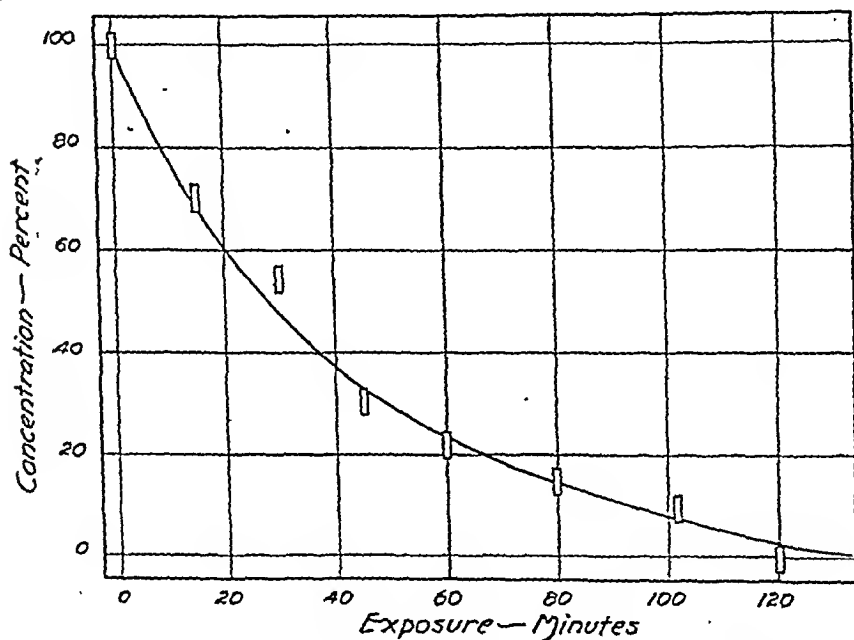


FIG. 4. Results of Experiment 56. Intensity, 12 meter candles; $k=0.011$.

that they are read usually to the nearest 5 per cent concentration. For further comparison there are inserted the values calculated from the formula assuming the average value of k ($= 0.030$). The similarity between the observed and calculated values is obvious.

2. Each of the experiments so far considered represents the changes in a single tube of visual purple. The solution is exposed for an interval, its concentration determined, then exposed for a second interval, and the process repeated until no further change occurs. Such a

mode of procedure assumes two things: one, that there is no period of induction in the photochemical action; and the other, that there is no after effect. If either of these is associated with the reaction, a different type of result,—qualitative perhaps, certainly quantitative,—is to be expected depending on whether the exposure is continuous or interrupted.

In order to settle this point several series of experiments were made in the following way. Seven or eight tubes of similar concentration and depth were prepared. One or two were run through in the ordinary way. The remaining tubes were exposed for a series of

TABLE I.

Experiment 85, Showing the Course of the Decomposition of Visual Purple by Light.

Time.	Concentration observed.	$k = \frac{1}{t} \log \frac{a}{a-x}$	Concentration calculated.
<i>min.</i>	<i>per cent</i>		<i>per cent</i>
0	100		
6	65	0.031	66
12	42	0.031	44
18	25	0.033	29
24	20	0.029	19
30	15	0.027	13
36	10	0.028	8
46	0		
Average.....		0.030	

increasing intervals; one for, say, 5 minutes, another for 8 minutes, another for 12 minutes, and so forth. In this way each solution was brought to a stage of decomposition by a continuous exposure as opposed to a series of intermittent exposures.

An example of such an experiment is given in Fig. 5. The black rectangles represent a single tube exposed intermittently in the ordinary way. The white rectangles each represent a separate tube of visual purple exposed continuously up to the point when its concentration was determined. The curve is again that of a monomolecular reaction, and it is apparent that it represents accurately the course of both types of experiment.

In a few tests the procedure was slightly varied. Two sets of tubes were run. In the one the readings were made intermittently, there being about seven interruptions in the exposure. In the other, the readings were also made intermittently, but with only two or three interruptions in the exposure. The results in the two cases were the

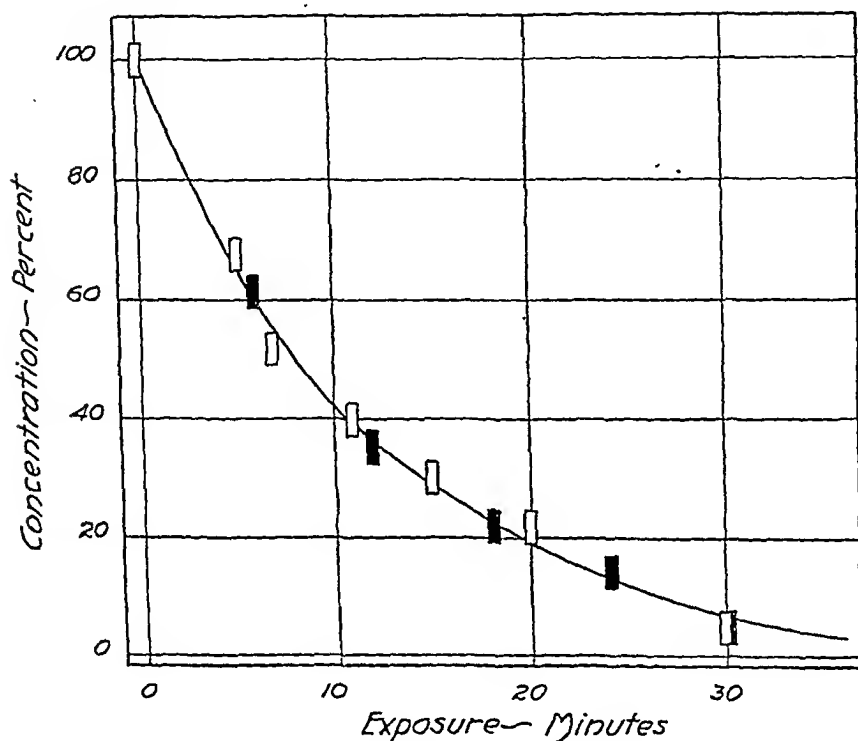


FIG. 5. A comparison of the effects of intermittent (black rectangles) and continuous (white rectangles) illumination on the velocity of decomposition. The black rectangles are from a single tube of visual purple. Each of the white rectangles represents a separate tube. Experiments 32 to 38 inclusive; intensity, 53 meter candles; $k=0.037$.

same within the limits of the experimental error. It may therefore be safely concluded that there are no aberrant factors such as an induction period or an after effect operating in these experiments.

It will be remembered that these results are to be expected on the basis of Talbot's law for the fusion of successive light flashes. In such

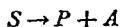
experiments the rate of intermittent illumination for the human eye is very much greater than those used here. The principle, however, is the same. Parker and Patten (1912-13) have recently shown that a continuous flow of light is a more efficient stimulus for the eye than an intermittent one (1,750 flashes per minute), the difference between the two being of the order of 5 per cent. It is not possible to compare these data with the present results on visual purple, because the experiments here reported do not admit of the judgment of differences of the order of 5 per cent in the magnitude of the velocity constant.

IV.

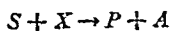
From the kinetics of visual purple decomposition it may be concluded that this photosensitive material is a chemical entity, and that its bleaching is probably represented by the destruction of a large molecule into smaller ones. In this respect it resembles the hypothetical sensitive substance postulated in the first section of this paper.

Too much reliance, however, must not be placed on the fact that the course of the reaction is monomolecular. Gross absorption and diffusion effects are, of course, eliminated by the thinness of the exposed solution; they therefore probably do not account for the monomolecular feature of the curve. But it is frequently true that the stoichiometric equation for a chemical reaction does not correspond to the equation obtained from kinetic data. In such cases (Lewis, 1918, p. 395) the stoichiometric equation turns out to be of a higher order. For example, it is conceivable that the bleaching of visual purple is a process of hydrolysis, in which case the stoichiometric equation may actually be bimolecular. However, because there is so much water present in the system, the reaction would proceed as if it were monomolecular, visual purple being the only component whose concentration changes to a measurable degree.

The equation



for the hypothetical light reaction is also not to be taken dogmatically. It may well be



assuming that X is a substance whose concentration in the system is so great that it suffers no sensible change during the reaction. Further discussion of these matters will, however, be postponed to a time when more data will have been presented.

SUMMARY.

1. Visual purple solutions are prepared under such conditions that the bleaching reaction is irreversible.

2. A method is described for the colorimetric estimation of very small quantities of visual purple. By this means the kinetics of the bleaching reaction are investigated.

3. The results show that the course of the decomposition follows that of a monomolecular reaction, without any measurable period of induction or after effect.

BIBLIOGRAPHY.

- Boll, F., *Zur Anatomie und Physiologie der Retina*, *Monatsber. Berlin. Akad.*, 1876, 783.
- Ewald, A., and Kühne, W., *Untersuchungen über den Sehpurpur*, *Unters. physiol. Inst. Heidelberg*, 1878, i, 139.
- Hecht, S., The dark adaptation of the human eye, *J. Gen. Physiol.*, 1919-20, ii, 499.
- Lewis, W. C. McC., *A system of physical chemistry*, New York, Bombay, Calcutta, and Madras, 1918, i.
- Parker, G. H., and Patten, B. M., The physiological effect of intermittent and of continuous lights of equal intensities, *Ann. J. Physiol.*, 1912-13, xxxi, 22.
- Sheppard, S. E., *Photochemistry*, New York, 1914.
- Trendelenburg, W., Quantitative Untersuchungen über die Bleichung des Sehpurpurs in monochromatischem Licht, *Z. Psychol. u. Physiol. Sinnesorg.*, 1904, xxxvii, 1; Die objectiv feststellbaren Lichtwirkungen an der Netzhaut, *Ergebn. Physiol.*, 1911, xi, 1.

THE MECHANISM OF INJURY AND RECOVERY.

By W. J. V. OSTERHOUT.

(From the Laboratory of Plant Physiology, Harvard University, Cambridge.)

(Received for publication, June 20, 1920.)

During the process of death the electrical conductivity of many tissues undergoes a change in electrical resistance by means of which the process may be followed with considerable precision. This may be utilized to measure injury and recovery.¹

An illustration of this is seen in Fig. 1, which shows the gradual fall in resistance² of *Laminaria* placed in 0.52 M NaCl.³ After an exposure of 5.2 minutes the resistance has fallen to 94.6 per cent of the resistance it had in sea water.⁴ If the tissue is then replaced in sea water the resistance rises (uppermost dotted line) and returns to practically normal value. This rise of resistance may be spoken of as recovery.

¹ Attention has been called in a previous paper (Osterhout, W. J. V., *J. Biol. Chem.*, 1915, xxiii, 67) to the need of accurate determinations of toxicity and to the use of electrical measurements for this purpose.

² For convenience in making comparisons the death curves used in a former paper (Osterhout, W. J. V., *Proc. Am. Phil. Soc.*, 1916, lv, 533) are employed as standards. Since in the recovery experiments the death curves vary somewhat (depending on the temperature, the condition of the material, etc.), it is permissible for comparative purposes to make the death curves coincide with the standard in as far as this can be done by multiplying the abscissæ by the proper factor (which is always the same for all the abscissæ of any particular recovery curve). This has been done throughout the experiments: otherwise an accurate comparison of the recovery curves would be difficult. The corrections made are relatively small, since, in order to make the results comparable, all experiments showing a wide deviation from the standard curves were rejected. Since the deviations are chiefly due to differences in temperature the chief result of the corrections is to make all the reactions appear as if they had taken place at the same temperature.

³ All the solutions had the same conductivity as sea water.

⁴ For convenience all results are expressed as per cent of the original resistance.



THE MECHANISM OF INJURY AND RECOVERY.

By W. J. V. OSTERHOUT.

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(Received for publication, June 20, 1920.)

During the process of death the electrical conductivity of many tissues undergoes a change in electrical resistance by means of which the process may be followed with considerable precision. This may be utilized to measure injury and recovery.¹

An illustration of this is seen in Fig. 1, which shows the gradual fall in resistance² of *Laminaria* placed in 0.52 M NaCl.³ After an exposure of 5.2 minutes the resistance has fallen to 94.6 per cent of the resistance it had in sea water.⁴ If the tissue is then replaced in sea water the resistance rises (uppermost dotted line) and returns to practically normal value. This rise of resistance may be spoken of as recovery.

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² For convenience in making comparisons the death curves used in a former paper (Osterhout, W. J. V., *Proc. Am. Phil. Soc.*, 1916, lv, 533) are employed as standards. Since in the recovery experiments the death curves vary somewhat (depending on the temperature, the condition of the material, etc.), it is permissible for comparative purposes to make the death curves coincide with the standard in as far as this can be done by multiplying the abscissæ by the proper factor (which is always the same for all the abscissæ of any particular recovery curve). This has been done throughout the experiments: otherwise an accurate comparison of the recovery curves would be difficult. The corrections made are relatively small, since, in order to make the results comparable, all experiments showing a wide deviation from the standard curves were rejected. Since the deviations are chiefly due to differences in temperature the chief result of the corrections is to make all the reactions appear as if they had taken place at the same temperature.

³ All the solutions had the same conductivity as sea water.

⁴ For convenience all results are expressed as per cent of the original resistance.

If, however, the exposure to the solution of NaCl lasts longer the tissue does not recover its normal resistance when returned to sea water. After prolonged exposure recovery is much less complete and as the tissue approaches the death point there seems to be no recovery when it is removed from the solution of NaCl and kept in sea water under normal conditions.

Fig. 1 shows that the recovery curves rise to certain definite levels and then run horizontally. If the conditions are favorable they may maintain this horizontal course for days; but if the control falls they also fall.

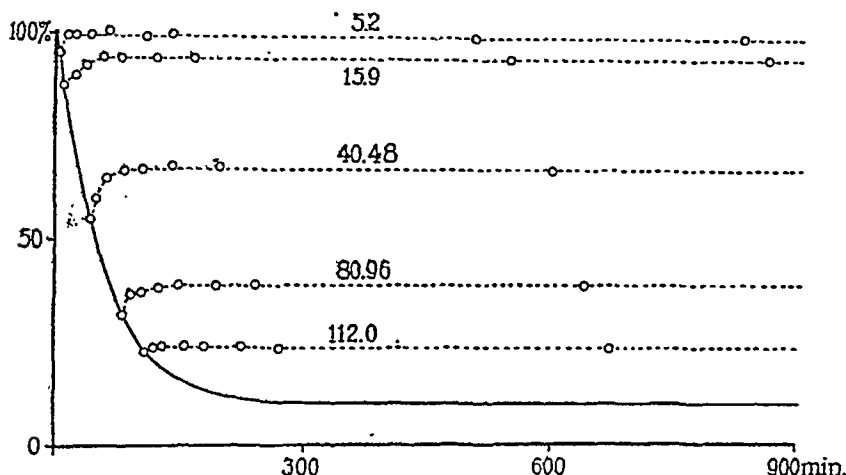


FIG. 1. Curves showing electrical resistance of *Laminaria agardhii* in NaCl, 0.52 M (unbroken line), and recovery in sea water (dotted lines). The figure attached to each recovery curve denotes the time of exposure (in minutes) to the solution of NaCl.

Another aspect of recovery is illustrated by the results obtained in mixtures of NaCl and CaCl_2 . Curve C in Fig. 2 shows the behavior of tissue placed in a solution containing 97.56 mols of NaCl to 2.44 of CaCl_2 ; its electrical resistance falling in 37.5 hours to 72.87 per cent of the original value in sea water. In a solution containing 85 mols of NaCl to 15 mols of CaCl_2 (Curve A) the resistance fell in the same time to practically the same point (72.47 per cent).

When these two lots of tissue were replaced in sea water they behaved differently. The resistance of the first lot rose to 78.2 per cent

(Fig. 2, upper dotted line) but the resistance of the second fell (much more rapidly than if it had not been removed to sea water) and eventually became practically stationary at 38.1 per cent (Fig. 2, lower dotted line).

One method of explaining these facts is to assume⁵ that the resistance is proportional to a substance M (contained within the cells), which is

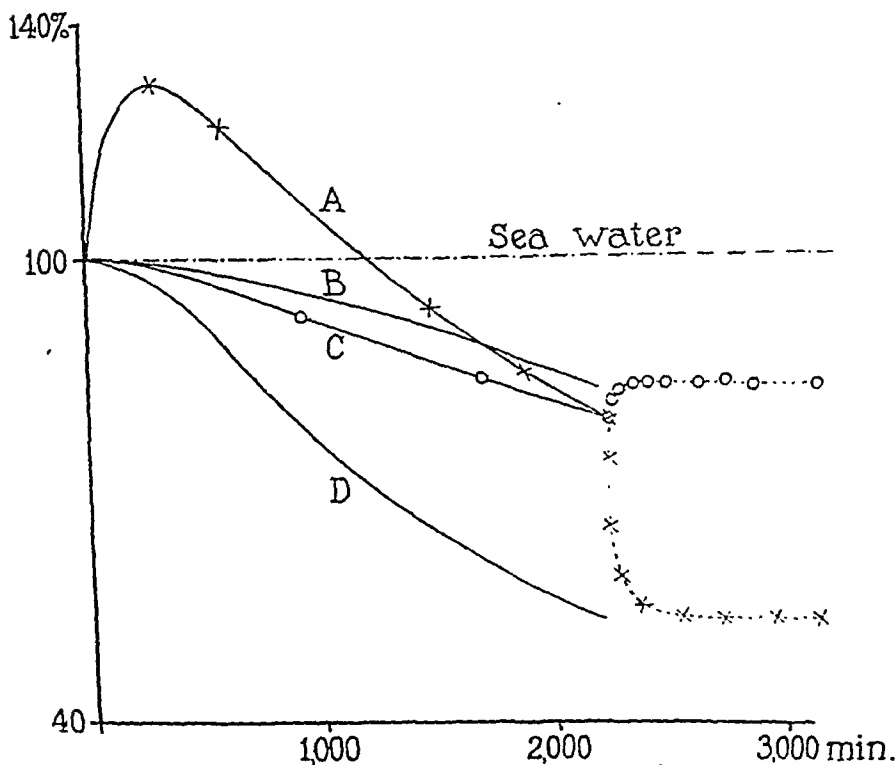


FIG. 2. Curves showing electrical resistance of *Laminaria agardhii* in a solution containing 97.56 mols of NaCl to 2.44 mols of CaCl_2 (Curve C) and in a solution containing 85 mols of NaCl to 15 mols of CaCl_2 (Curve A). The dotted lines show recovery in sea water. Curves B and D show the levels to which the resistance rises when the tissue recovers in sea water after exposure to these mixtures; their abscissæ denote the times of exposure. Curve B pertains to the first mixture (belonging with Curve C), while Curve D pertains to the second mixture (belonging with Curve A).

⁵ Cf. Osterhout, W. J. V., *Proc. Am. Phil. Soc.*, 1916, lv, 533.

formed and decomposed by a series of reactions according to the scheme



We assume that in sea water the amount of M remains constant because it is formed as rapidly as it is decomposed. When, however, it is transferred to a solution of NaCl (or to the first of the two mixtures mentioned above) the resistance falls, because M is decomposed more rapidly than it is formed. In the second mixture the resistance rises, because M is formed more rapidly than it is decomposed, but after a certain time the rate of formation decreases and the resistance falls steadily.

We suppose that when tissue is placed in the solution of NaCl (or in the mixtures) the reactions $O \rightarrow S \rightarrow A$ cease. In the solution of NaCl (and in the first mixture) the amount of M diminishes on account of the gradual exhaustion of A ; in the second mixture the reaction $A \rightarrow M$ is so rapid that a temporary increase in the amount of M results, but this is inevitably followed by a decrease as the supply of A becomes exhausted.

When the tissue is replaced in sea water the reactions $O \rightarrow S \rightarrow A$ are supposed to recommence. The supply of A is therefore replenished and the resistance will return to the normal value, provided O is present in large amount and suffers practically no change during the experiment. But if it should diminish by one-half as the result of exposure to NaCl it could restore M to only half of its original value. We may therefore regard the level to which M is restored as an index of the condition of O . If we plot this level after various periods of exposure to the first mixture we get Curve B in Fig. 2 (and for the second mixture, Curve D).⁶

If we use the term recovery for the rise of resistance which occurs when tissue is transferred to sea water from certain solutions (such as the first mixture) there seems to be no good reason why it should not be applied to the fall of resistance which occurs when tissue is transferred from certain other solutions (such as the second mixture) to sea water. The amount of recovery after any given period of exposure

⁶ A similar curve could be drawn for Fig. 1 but it has been omitted in order to avoid confusion.

is equal to the vertical distance between Curves B and C, in the case of the first mixture, and between Curves A and D in the case of the second mixture.

If we use the term injury to denote loss of resistance, we may define temporary injury⁷ as the loss which occurs in the solution and permanent injury as the loss which is observed after the tissue has been returned to sea water and the resistance has risen or fallen to a stationary condition. Curves B and D are therefore the curves of permanent injury.

It may be asked whether Curves B and D are better criteria of toxicity than Curves A and C. The question involves the definition of toxicity. Since this term is used in a variety of ways, it is desirable that it should always have a precise quantitative significance. In the present case it is evident that we need not only A and C but also B and D for a complete description of the facts. It seems possible that this may be generally true in the study of toxicity, although at present we may be unable to construct similar curves in many cases because suitable methods of measurement are lacking.

The fact that recovery is never complete except at the beginning (as shown by Curves B and D) might also be explained as due to the death of certain cells; for if some of the cells are killed by exposure to a solution of NaCl the complete recovery of the surviving cells cannot restore the resistance to its normal value. The chief objections to this explanation are that during the death process the cells seem to act alike and to die at about the same time; moreover this assumption does not lend itself readily to quantitative treatment. It does not seem to be necessary to discuss this point more fully at present; but it may be pointed out that this hypothesis would in no way invalidate the conception developed above, that an individual cell may lose part of its resistance and subsequently regain it, either partially or completely.

⁷ Substances which cause increase of resistance commonly produce permanent injury; this is apparent when the tissues are replaced in sea water. It would therefore seem that any alteration of resistance (increase or decrease) may produce permanent injury if sufficiently prolonged. In spite of this it seems preferable to restrict the term temporary injury to the fall of resistance observed in toxic solutions without coining a new term to express the injurious action of rise of resistance.

The fact that in the case of *Laminaria* recovery may be either partial or complete, according to circumstances, raises the question whether this is also true of other forms. It is certainly true of all the plants investigated by the writer, such as the green alga, *Ulva* (sea lettuce), the red alga, *Rhodomenia* (dulse), and the flowering plant, *Zostera* (eel grass). It seems to be also true of frog skin as far as the experiments of the writer have gone.⁸ In physiological literature it seems to be generally assumed that when recovery occurs at all it is practically complete. It is evident that partial recovery might easily be overlooked except in cases where recovery can be measured with considerable accuracy, and it seems possible that further investigation may show that partial recovery is a general phenomenon.

If we accept the conclusions stated above we are obliged to look upon recovery in a somewhat different fashion from that which is customary. Recovery is usually regarded as due to the reversal of the reaction which produces injury. The conception of the writer is fundamentally different; it assumes that the reactions involved are irreversible (or practically so) and that injury and recovery differ only in the relative speed at which certain reactions take place.

Thus in the series of reactions $O \rightarrow S \rightarrow A \rightarrow M \rightarrow B$, if the rate of $O \rightarrow S$ becomes slower than the normal, injury will occur, while a return to the normal rate will result in recovery. Injury could also be produced by increasing the rate of $M \rightarrow B$, or decreasing the rate of $S \rightarrow A$ or $A \rightarrow M$.

If life is dependent upon a series of reactions which normally proceed at rates bearing a definite relation to each other, it is clear that a disturbance of these rate-relations may have profound effects upon the organism, and may produce such diverse phenomena as stimulation, development, injury, and death. It is evident that such a disturbance might be produced by changes in temperature⁹ (in case the temperature coefficients of the reactions differ) or by chemical agents. The same result might be brought about by physical means, especially where structural changes occur which alter the permeability of the plasma membrane or of internal structures (such as the nucleus and plastids) in such a way as to bring together substances which do not normally interact.¹⁰

⁸ The recovery experiments on frog skin have been few in number and were devoted chiefly to the effects of anesthetics.

⁹ Cf. Osterhout, W. J. V., *J. Biol. Chem.*, 1917, xxxii, 23.

¹⁰ Or which normally react to a lesser degree.

INHIBITORY ACTION OF PARATYPHOID BACILLI ON THE FERMENTATION OF LACTOSE BY BACILLUS COLI. I.

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(Received for publication, July 8, 1920.)

In nature, organic matter is attacked by a large variety of bacteria and in its disintegration a number of species may take part. A knowledge of just how the species are associated in any given substrate or in what order they succeed one another in the process of decomposition might be of great value to the biochemist in supplying a point of approach hitherto neglected. There is evidence that there is some order in the mode of attack and that this order is conditioned by the nature of the medium and certain environmental factors, such as temperature, reaction, and oxygen supply. In the following pages one single detail of this general problem was examined under conditions which excluded all but two bacteria, one following the other.

If a fermentation tube containing fermented bouillon plus 1 per cent lactose be inoculated with some member of the paratyphoid group, the multiplication causes a heavy clouding or even turbidity in the open arm.

The growth in the closed arm depends on the degree to which the muscle sugar has been removed. If this is complete, no growth takes place. The clouding of the branch is therefore proportional to the amount of muscle sugar remaining. Titration shows little or no change of reaction in the closed arm, beyond what is due to a movement of fluid from open to closed arm. The fluid in the open arm becomes neutral and finally alkaline to phenolphthalein, the degree of alkalinity being a function of the multiplication which in turn is a function of the alkali-tolerance of the particular strain used. If after 4 to 6 days of incubation the same tube is reinoculated, this time with a true colon bacillus known to ferment lactose, one of two things may happen:

1. The resulting fermentation takes the usual course as if no prior inoculation had been made; *i.e.*, the production of acid and gas goes on quantitatively as in a fresh tube.

2. The second organism multiplies actively, clouds the closed branch as usual, but no gas is produced. Titration shows that the usual amount of acid has been produced.

In order to determine whether the particular type of second or superadded fermentation is constant for the same organism, numerous tests have been made during the past 1½ years, with the result that with the same combination of cultures the same result follows.

Furthermore the various types of paratyphoid bacilli which happened to be on hand in the laboratory were tested to see just what grouping would result if this kind of superadded fermentation were used as a basis of classification. The results of this latter test are in many respects suggestive.

All true hog-cholera bacilli left the lactose medium uninfluenced. The fermentation of the second organism proceeded as in a fresh unused medium. Among the hog-cholera bacilli were those of widely different ages. The oldest one had been isolated by one of us early in 1886¹ and was described at that time as a membrane-producing variant. The most recent strain had been isolated by Dr. TenBroeck at Camp Upton late in 1918 (No. XVI).

Among cultures not isolated from swine, *Bacillus icteroides* Sanarelli acted like a true hog-cholera bacillus. That this organism may have been a true hog-cholera bacillus is made highly probable by the experiments of Reed and Carroll.² They found a complete identity of the two types in morphological, cultural, pathogenic, and agglutinative characters. *Bacillus icteroides* also produced fatal enteritis associated with necrosis of the mucosa of the large intestine in young pigs. One of these experiments was so carefully controlled that the, at that time, still unknown filterable virus of hog-cholera could hardly have come into consideration as a cause of the lesions. Moreover the autopsy notes do not suggest the filterable virus.

¹ Smith, T., *3rd Ann. Rep. Bureau Animal Industry, U. S. Dept. Agric.*, 1886, 622.

² Reed, W., and Carroll, J., *J. Exp. Med.*, 1900-01, v, 215.

Of the cultures isolated from swine which failed to give the same reaction as the true hog-cholera bacillus was a non-motile organism isolated by Professor T. J. Burrill from the liver of a pig in 1897, and described briefly by one of us³ in 1899. This strain could be differentiated from the true hog-cholera bacillus only through the absence of motility and a reduced virulence. *Bacillus coli* following this produced only a large bubble of gas in lactose bouillon.

Among the cultures tried which belong to the first group are Hog-cholera Nebraska (1886), Massachusetts (1895), Maryland (1898), Arkansas (1899), and Hog-cholera X, XI, XII, XIII, XIV, and XVI, each from a different outbreak; also *suipestifer* Voldagsen, and the non-gas-producing hog-cholera strain of M. Dorset. In several of the above strains mutants had appeared in the stock cultures. One of these produced a viscid growth, the other had lost the power of gas production in lactose. All these acted alike in not restraining gas production subsequently by *Bacillus coli*.

Among the paratyphoid and *enteriditis* strains in the collection the following came under the second group: paratyphoid strains recently isolated from four calves and one fetus by one of us; paratyphoid Strains 225, 232, 234, and 242; Schottmüller A and B; paratyphoid from a pigeon and a cow's brain, all received from other laboratories; Rat-typhus I, III, IV, and V; Swine-typhus I, II, III, IV, and V, *Spermophile* typhus I, Dog-typhus I, Guinea pig-typhus VII, VIII, Mouse-typhus I, II, *Bacillus enteriditis* 47, 204, Gaertner (Kral and Mt. Sinai), and swine *enteriditis*. The one exception noted thus far was marked paratyphoid (Longcope). Dr. TenBroeck⁴ had previously examined this strain and found it culturally and serologically a hog-cholera bacillus. Its virulence, however, towards rabbits is very low as compared with true hog-cholera bacilli.

One culture of human typhoid tried thus far inhibited gas production and belongs therefore to the second group. A culture of paratyphoid bacilli from man which Hirschfeld has denominated Group C and which has been shown by TenBroeck⁴ to belong culturally to the paratyphoid and serologically to the hog-cholera group, but with

³ Smith, T., *Centr. Bakt., Itc Abt.*, 1899, xxv, 241.

⁴ TenBroeck, C., *J. Exp. Med.*, 1920, xxxii, 33.

a reduced virulence, acted like a true paratyphoid in inhibiting gas production.

The rather sharp distinction which this reaction makes between true hog-cholera bacilli and other paratyphoid strains made it seem desirable to test the several members of the dysentery group on hand. All strains tested, including those marked Shiga, Flexner, Hiss Y, Flexner-Harris, and Strong, acted like the hog-cholera group in that the second or *Bacillus coli* fermentation was not inhibited as to gas production. Similarly the group of paratyphoid-like bacilli attacking poultry (fowl typhoid and white diarrhea) did not inhibit gas production by *Bacillus coli*.

So far, to avoid confusion, the second fermentation has been restricted to two colon strains isolated from a calf. The strain of *Bacillus coli* used most constantly in the various experiments was isolated in December, 1918, from the liver of a calf (No. 302) affected with pneumonia and septic complications. It possesses motility to a certain degree, ferments dextrose and lactose with the accumulation of from 50 to 60 per cent gas in the closed arm of the fermentation tube, and produces a titratable acidity of 4 to 6 per cent of a normal solution. The gas formula H/CO_2 is of the usual type, the explosive portion being 2 to $2\frac{1}{2}$ times the CO_2 in volume. Saccharose is fermented more slowly and about 25 per cent gas accumulates. The second strain (No. 435) was isolated from the spleen of a very young calf affected with digestive derangements, called scours. It was in all cultural characters like the preceding.

Wherever gas production is referred to in the following pages, the accumulation of gas in the fermentation tube is meant. The acid produced is quoted in per cent of titratable acid in terms of a normal solution.

It is to be predicted that all races of *Bacillus coli* will not act alike since there are so many minor distinguishing morphological, cultural, fermentative, and serological features observed among them. Some preliminary tests with other colon bacilli have been made but the data are incomplete.

Experiments to Determine the Nature of the Inhibition.

The Effect of Removing the Paratyphoid Bacilli.—The first suggestion to present itself was that the paratyphoid bacilli might have changed the lactose in some way. If so, in the bouillon deprived of the paratyphoid bacilli by filtration the colon bacilli should act differently than in fresh bouillon. It was found, however, that the complete removal of paratyphoid bacilli from the culture fluid by passing it through a Berkefeld filter restores gas production. The experiments were made by growing the paratyphoid bacilli in large centrifuge bottles and filtering after centrifuging. The filtrate was put into sterile fermentation tubes and inoculated with *Bacillus coli*. Table I gives some of the results.

TABLE I.

Strain of paratyphoid used.	Age of culture when centrifuged and filtered.	Results of inoculation with <i>B. coli</i> , Calf 302.	
		Gas.	Acid in open arm.
	days	per cent	
Calf 299.....	10	26.5	5.10
" 299.....	10	45.0	4.75
" 297.....	6	47.2	4.60
" 297.....	6	52.0	

The next step was to proceed as in the former experiment but to omit the filtration. The centrifuged fluid did not become entirely clear and when inoculated with *Bacillus coli* only a very little gas was produced. Apparently the presence of a very faint cloud of paratyphoid bacilli was sufficient to inhibit almost completely gas production by *Bacillus coli*. The hog-cholera control treated in the same way did not inhibit gas production (Table II).

In order to remove as far as possible all bacteria without subjecting the culture fluid to final filtration, the following procedure was carried out. The primary culture was conducted as in the foregoing experiment in large centrifuge bottles, holding 250 cc. and plugged with cotton wool. After an incubation of about 4 days sufficient to yield a maximum multiplication a certain quantity of sterile kaolin powder was added to the fluid, the bottles were closed with

sterile rubber stoppers, and thoroughly shaken by hand. They were then centrifuged for about 30 minutes, at the end of which time the supernatant fluid was clear to the unaided eye in transmitted light. It was then transferred with sterile pipettes to sterile fermentation tubes and inoculated with *Bacillus coli*, Calf 302.

TABLE II.

Strain used.	Age of culture when treated.	Time of centrifugation.	Results of inoculation with <i>B. coli</i> , Calf 302.	
			Gas.	Acid in open arm.
	<i>days</i>	<i>min.</i>	<i>per cent</i>	
Paratyphoid, Calf 297.....	7	30	Bubble only.	3.80
" " 297.....	7	30	1-2	4.61
Hog-cholera XII.....	10	30	60	5.30

To determine whether the kaolin itself might add anything to the medium to influence the result various controls were introduced as shown in Table III.

TABLE III.

Effect of Centrifuging and Clearing First Culture with Kaolin on Second Culture.

Experiment.	Treatment of first culture. (Paratyphoid, Calf 299.)	Results of inoculation of second culture. (<i>B. coli</i> , Calf 302.)	
		Gas.	Reaction of open arm (acidity).
		<i>per cent</i>	
<i>a</i>	Sterilized kaolin added, bottle shaken and centrifuged 30 min., transferred to fermentation tubes.	65	4.56
<i>b</i>	Sterile control fluid, treated as under <i>a</i> before inoculating with <i>B. coli</i> .	93	4.55
<i>c</i>	Sterile control fluid without kaolin.	62	5.40
<i>d</i>	Fermented bouillon without lactose, shaken with kaolin.	0	0.27 (Open arm.) 1.58 (Closed ")

Tube *a* shows that a complete clearing of the culture fluid from paratyphoid bacilli restores gas production by *Bacillus coli* and is equivalent to filtration. Tubes *b*, *c*, and *d* were to show whether kaolin modified the fermentation. The larger amount of gas produced in *b* indicates the presence of some favoring impurity on gas produc-

tion, possibly a carbonate. Tube *c* checked the culture medium and Tube *d* proved the absence of fermentescible sugars in the kaolin.

Effect of Density of Suspension of Paratyphoid Bacilli.—In the foregoing tests the primary culture was usually 4 days old before the second inoculation was made. The mere presence of paratyphoid bacilli in the culture fluid might have some influence irrespective of any incubation period. Experiments were therefore undertaken to eliminate this period. The growth of paratyphoid bacilli on slanted agar was washed off with bouillon and suspended in lactose bouillon in fermentation tubes. The suspension was varied in density by using the growth of one, two, and four slants respectively. Immediately after the suspension was made a loopful of *Bacillus coli* was introduced from an agar culture and the tubes incubated. The gas production was not inhibited but it accumulated more slowly than in control tubes. After 7 days incubation 70, 68, and 66 per cent of gas had accumulated. The reaction of fluid in the bulb was 4.61, 4.96, and 4.91 per cent of a normal acid respectively. It should be stated that the density of the suspension of paratyphoid bacilli, even in the closed arm of the first tube, was much greater than that developing directly in lactose bouillon. No inhibition of gas production was thus produced by the mere presence of large numbers of living paratyphoid bacilli, both strains being introduced together.

In another experiment, the relation of the bacilli to the inhibition was put to a more rigorous test. A large centrifuge bottle containing lactose bouillon and inoculated with paratyphoid, Calf 297, was incubated for 6 days. One fermentation tube was then filled with the culture fluid and inoculated with *Bacillus coli*, Calf 302, and incubated as a control. Another lot from the same bottle was centrifuged until the supernatant fluid was only faintly clouded. This fluid was transferred to a second fermentation tube and inoculated with *Bacillus coli*. The thick bacterial sediment in the centrifuge tubes from 30 cc. of the culture fluid was transferred to 25 cc. of fresh lactose bouillon in a fermentation tube and inoculated with *Bacillus coli*. Over 50 per cent gas was promptly produced in the third tube. In the others a small bubble appeared partly derived from fine bubbles transferred with the culture fluid.

The Effect of the Concentration of Lactose.—In the foregoing tests 1 per cent lactose was used throughout. It was thought, however, that less or more might affect the uniformity of results. Before taking up the experiment it became necessary to consider what minimum per cent of lactose was necessary for *Bacillus coli* to produce the maximum amount of gas. Earlier, repeated trials by one of us had shown that 0.5 per cent lactose yields about as much gas as 1 per cent or more. Table IV shows that the same result is obtained whether a concentration as low as 0.5 per cent or as high as 2 per cent lactose is used. Numerous tests of the gas formula in these experiments indicated no appreciable change in the relative amounts of H and CO₂. These tests have therefore been omitted from the tables.

TABLE IV.

Effect of Different Concentrations of Lactose on Secondary Fermentation by B. coli, Calf 302.

Primary culture.	Lactose.	Interval between primary and secondary cultures.	Gas produced.	Acid produced.	
				Open arm.	Closed arm.
	per cent	days	per cent		
Paratyphoid 297.....	0.5	6	0	5.0	5.0
Hog-cholera XII.....	0.5	6	57	5.2	
Paratyphoid 297.....	2.0	4	0	3.7	4.8
Hog-cholera XII.....	2.0	4	62	4.8	

The absence of lactose in the primary culture does not interfere with the establishment of inhibition. Cultures of paratyphoid bacilli in fermented bouillon without lactose will inhibit subsequent gas production by *Bacillus coli* when the latter and lactose are added at the same time after the primary culture has grown 4 or more days. To ensure the above results, there must be distinct clouding of the closed arm by the paratyphoid bacilli. Absence of multiplication due to a too thorough removal of muscle sugar fails to establish inhibition.

Effect of the Age of the Primary Culture.—Certain experiments had indicated that the age of the primary culture before inoculation with *Bacillus coli* was not an indifferent factor. Taking the combination

paratyphoid, Calf 297, and *Bacillus coli*, Calf 302, *Bacillus coli* was inoculated at the same time with and hours after the paratyphoid bacillus to determine how long a growth period is required by the primary culture before it becomes completely inhibitory.

Table V shows that inhibition begins after 4 hours and is nearly complete at 14 hours with one lot of bouillon. With another it is not complete at 72 hours. This difference is probably due to the degree of removal of the last traces of muscle sugar during the prep-

TABLE V.

Effect of Age of Primary Culture on Inhibition of Gas Production.

Age of primary culture before second inoculation.	Amount of gas produced.	Acid produced in open arm.	Acid produced in closed arm.
Bouillon 1,003.			
0 (Simultaneous.)	58	4.2	
2 hrs.	53	3.9	
4½ "	28	3.9	4.0
6½ "	24	4.2	3.9
8 "	20	3.8	4.2
10 "	11.5	4.4	4.2
12 "	10	4.9	4.2
14 "	5	4.6	4.9
Bouillon 985.			
21 hrs.	13	6.0	4.7
2 days.	12.5	4.9	4.7
3 "	10	5.3	3.8
4 "	0	4.2	3.9

aration of the fermented (lactose) bouillon which controls the clouding of the closed arm.

It has been observed in certain experiments in which the second organism was introduced later than 4 days after the first, that in those cultures in which gas production was not inhibited, as in the hog-cholera group, the total quantity of gas produced was nevertheless not up to the usual amount. This observation led to the inference that perhaps here also the time element was a determining factor.

Table VI gives the results of an experiment to clear up this question. Hog-cholera bacilli were introduced into a number of lactose tubes and kept different periods of time before *Bacillus coli* was introduced. Cultures incubated 19 days before the second inoculation inhibited gas production completely. Those incubated up to 6 days failed to inhibit. The rest produced variable amounts of gas.

The paratyphoid bacillus thus produces a condition in 2 to 4 days which the hog-cholera bacillus brings about in 18 days. It is interesting to note that this period roughly corresponds to the time

TABLE VI.

Effect of Age of Primary Culture on Inhibition of Gas Production. (Primary Culture, Hog-Cholera Bacillus XII; Secondary Culture, B. coli, Calf 302.)

Age of primary culture when <i>B. coli</i> inoculated.	Amount of gas produced.	Acid produced.	
		Open arm.	Closed arm.
	<i>per cent</i>		
0 (Control.)	65	5.0	4.9
3 days.	60	5.2	5.7
6 "	50	6.2	5.6
11 " *	5	5.9	5.6
11 "	32	4.6	5.2
14 "	7	4.8	5.5
18 "	0	4.8	6.0
19 " *	0	4.9	5.0

* Primary culture grown with about $\frac{1}{2}$ of closed arm containing air. This was tipped out when *B. coli* was inoculated.

required by the hog-cholera bacillus to produce a translucency of milk when used as a culture medium. This translucency proceeds parallel with the increasing alkalinity of the medium. The different behavior of the paratyphoid and the hog-cholera bacilli is thus quantitative rather than qualitative, but the difference is such that at a certain time the phenomenon may be used as a qualitative test.

The gradual development of inhibition by the hog-cholera group is paralleled by a gradual loss of inhibition by the paratyphoid bacillus. This was demonstrated in the following manner. A culture of the paratyphoid bacillus, Calf 297, grown in lactose bouillon in a

centrifuge bottle was transferred to fermentation tubes after 7, 24, and 32 days and then inoculated with *Bacillus coli*, Calf 302. The 7 day culture inhibited gas formation completely, the 24 day culture developed 44 per cent gas, the 32 day culture 35 per cent. The three tubes developed the usual amount of acid. In another experiment a culture of paratyphoid bacilli 22 days old yielded after inoculating with *Bacillus coli* 13 per cent gas. It is probable that the inhibition produced after 18 days by the hog-cholera bacillus is gradually lost later on, but no experiments have been made to test this assumption.

The Effect of Killing Paratyphoid Bacilli by Heat on Inhibition of Gas Production by Bacillus coli.

The results of the various experiments made thus far led to a study of the behavior of dead bacilli on gas production. Numerous experiments were carried out with a variety of controls in each but the results were not entirely concordant and pointed to some neglected factor. In all cases the exposure to temperatures which failed to kill the first culture failed to destroy inhibition. After the thermal death point had been reached the results became irregular, but the experiments all agreed in that inhibition was destroyed as the temperature rose and at 100°C. and above gas production was more or less completely restored. A careful analysis of the details of the experiments which are not reproduced here led to the hypothesis that mere death of the first culture is not sufficient to destroy inhibition but that there is another factor involved which disappears rapidly on exposure to high temperatures or gradually at lower incubator temperatures. To demonstrate the gradual disappearance of inhibition the experiments given in Table VII were made. Cultures of paratyphoid bacilli in lactose bouillon contained in large centrifuge bottles were exposed to 62°C. for 35 minutes. Subcultures were made at once and after 1 or more days of incubation to determine whether any bacteria had survived. The culture fluid was transferred to fermentation tubes at once and after the heated fluid had been incubated for 1 or more days. Subcultures were made at each transfer to determine sterility.

TABLE VII.

Effect of Incubation of 5 Day Cultures of Paratyphoid Bacilli (Calf 297) Heated at 62°C. for 35 Minutes on B. coli (Calf 302).

No. of days in incubator.	Gas produced.	Acid in open arm.	Remarks.
	<i>per cent</i>		
0	6-7	4.87	Subculture sterile.
1	5	5.60	" "
3	60	5.10	" "
5	59	5.19	" "
0	4	4.97	" "
4	5½	6.00	" "
7	56	5.18	" "

DISCUSSION AND SUMMARY.

Bacteria of the paratyphoid group may be divided into two classes according to the behavior of 4 day cultures in lactose bouillon after a second inoculation with certain types of *Bacillus coli*. One class includes all true hog-cholera bacilli, the other nearly all true paratyphoid and *enteriditis* types. Under the imposed conditions *Bacillus coli* produces the usual amount of gas in the presence of the first group. In the presence of the second no gas or only a bubble appears. The production of acid is not interfered with.

The significance of the inhibition was investigated in a variety of ways suggested by the particular hypothesis entertained at the time. Two main possibilities presented themselves; first, the direct association of the inhibition with living paratyphoid bacilli, and, second, the existence of a ferment or other product of growth as the inhibiting agent.

The theory that the living bacilli or those killed at the lowest possible temperature are responsible was favored by a number of experiments. Thus the complete removal of bacteria by filtration, or by centrifugation combined with the use of kaolin to produce a clear fluid restored gas production. The presence of a fine cloud of bacteria was sufficient to inhibit. On the other hand, the addition of large numbers of living bacteria from agar slants or from lactose bouillon after the requisite incubation period to fresh lactose bouillon

failed to inhibit gas production when *Bacillus coli* was added simultaneously.

When the inhibiting culture was heated at 62°C. for 35 minutes to sterilize it, gas production was still largely inhibited. But it was restored when higher temperatures were used, completely at 100°C. and above. It was also gradually restored by exposing the heated culture to 37°C. for 3 or more days.

The presence of variable amounts of lactose, or even the complete absence of lactose did not interfere with the development of the inhibitory factor.

The activity of the inhibition factor presents itself in the form of a curve, beginning at 0 when both paratyphoid and colon bacilli are inoculated simultaneously and rising as *Bacillus coli* is inoculated at longer intervals from the paratyphoid bacilli. The maximum of inhibition is reached at about the 4th day; thereafter it remains at the same level for a few days and then gradually falls until it is lost within 3 or 4 weeks. The curve of the hog-cholera group is delayed in that the maximum inhibition is reached at the end of 3 weeks. These curves have not been accurately determined. Taking into consideration all the accumulated data the writers tentatively present the hypothesis that the inhibitory factor is some metabolic product of the paratyphoid bacillus, possibly an enzyme, which is destroyed at a temperature somewhat above the thermal death point of the bacilli and which more gradually disappears from incubated cultures. The substance fails to pass Berkefeld filters. It is carried down mechanically with substances clearing the culture fluid.

The experiments support current theories which hold that the acid-producing and gas-producing entities in cultures are distinct.



COMPARATIVE STUDIES ON RESPIRATION.

XII. A COMPARISON OF THE PRODUCTION OF CARBON DIOXIDE BY PENICILLIUM AND BY A SOLUTION OF DEXTROSE AND HYDROGEN PEROXIDE.

By F. G. GUSTAFSON.

(From the Laboratory of Plant Physiology, Harvard University, Cambridge.)

(Received for publication, June 11, 1920.)

The writer has shown¹ that the production of CO₂ by *Penicillium chrysogenum* is increased by acid and decreased by alkalies. The next step is to investigate the mechanism by which CO₂ is produced. For this purpose it seems desirable to try to construct an artificial system which would imitate the action of the fungus.

In the experiments with *Penicillium* the oxidizable substance was for the greater part dextrose, as the fungus was kept in a 0.5 per cent solution of that substance. A 0.5 per cent dextrose solution was therefore chosen as the basis of the artificial system. From a number of available oxidizing agents hydrogen peroxide was chosen as being the most promising. Dakin² states that of the various oxidizing agents hydrogen peroxide comes nearest to bringing about the same reactions *in vitro* as normally take place within the organism. An artificial system was accordingly made which consisted of a 0.5 per cent solution of dextrose plus hydrogen peroxide.³

The experiments were performed in essentially the same manner as those already described¹ except that the artificial system was substituted for the fungus. In each experiment the hydrogen ion concentration was kept constant during the whole experiment and the rate of production of CO₂ was measured before and after the addition

¹ Gustafson, F. G., *J. Gen. Physiol.*, 1919-20, ii, 617.

² Dakin, H. D., *Oxidations and reductions in the animal body*, London, 1912.

³ In these experiments "Dioxigen" was used, as it is nearly neutral and it is stated by the makers to contain only 0.04 per cent of substances other than water and hydrogen peroxide, no preservative being added.

of hydrogen peroxide, while in the experiments with the fungus the hydrogen ion concentration was varied during the experiment. The results are nevertheless comparable in the two cases.

In the final experiments the same bottle of "Dioxygen" was used throughout, so that the results would be exactly comparable. It was found that the contents of two bottles which titrated the same with permanganate did not give the same results in respect to the amount of CO_2 produced. For this reason all the data here published were obtained by the use of hydrogen peroxide from the same bottle.

The time required to cause a standard change in the indicator tube, when the other tube contained 0.5 per cent dextrose but no hydrogen peroxide, was taken as 100 per cent. This change may have been caused by a leak in the apparatus or by the breaking down of the dextrose or by both. The source of the CO_2 is of no importance for the measurement. It is only necessary that in the absence of hydrogen peroxide the rate of production of CO_2 should be constant so that the rate found after the introduction of the hydrogen peroxide could be compared with it. For convenience the rate in the absence of hydrogen peroxide is called the normal rate; the rate after the addition of hydrogen peroxide is expressed in terms of the normal. This normal change was very slow and varied between 20 and 35 minutes.

In beginning an experiment the 0.5 per cent dextrose solution was made up to the desired hydrogen ion concentration; 60 cc. of this solution were put into the apparatus and the air was caused to circulate for 2 hours or more till all dissolved CO_2 had been pumped out. Several readings were then taken to get the normal rate of change. Then 8 cc. of hydrogen peroxide were added by opening the flask holding the dextrose solution; 3 minutes were allowed to elapse before the first reading was taken so as to allow a thorough mixing of the solution. In the first few minutes the production of CO_2 was very great, but as will be seen from Fig. 1, it fell off very rapidly in the solution having a pH of 1, while in the neutral solution the fall was not so rapid.

The experiments with the alkaline solutions were made with the direct method (without the apparatus for the circulation of air) as described in a previous paper.¹ Experiments were first made with neutral solutions. The dextrose solution was placed in a tube,

hydrogen peroxide was then added, and 4 minutes were allowed to elapse. The time required to produce a definite⁴ amount of CO_2 was then measured. The time it took to produce the same amount of CO_2 in the alkaline solution was then compared with the time in the neutral solution.⁵ In Fig. 1, the comparison is expressed by taking

Rate of CO_2 production

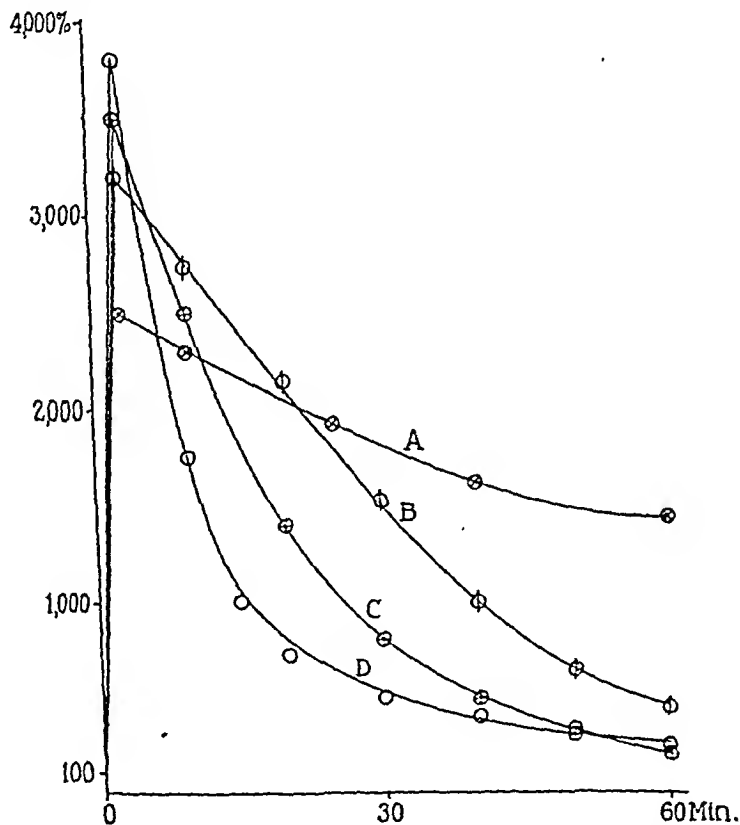


FIG. 1. Curves showing the rate of production of CO_2 by a solution of dextrose and hydrogen peroxide. Curve A shows the rate in a solution having a pH of 8.75, B in a solution of pH 7, C in a solution of pH 5, D in a solution of pH 1. The rate in the absence of hydrogen peroxide is taken as 100 per cent.

⁴ This was ascertained by titrating with CO_2 as described in a former paper. (Gustafson, F. G., *J. Gen. Physiol.*, 1919-20, ii, 617.)

⁵ The experiments with alkaline and neutral solutions were carried out almost simultaneously.

for the alkali curve a proportional part of the ordinate of the neutral curve obtained by the use of the apparatus. Thus if by the direct method the rate of production of CO_2 in the alkaline solution was two-thirds as great as in the neutral solution it was assumed that this would also be the case if the experiment could be performed in

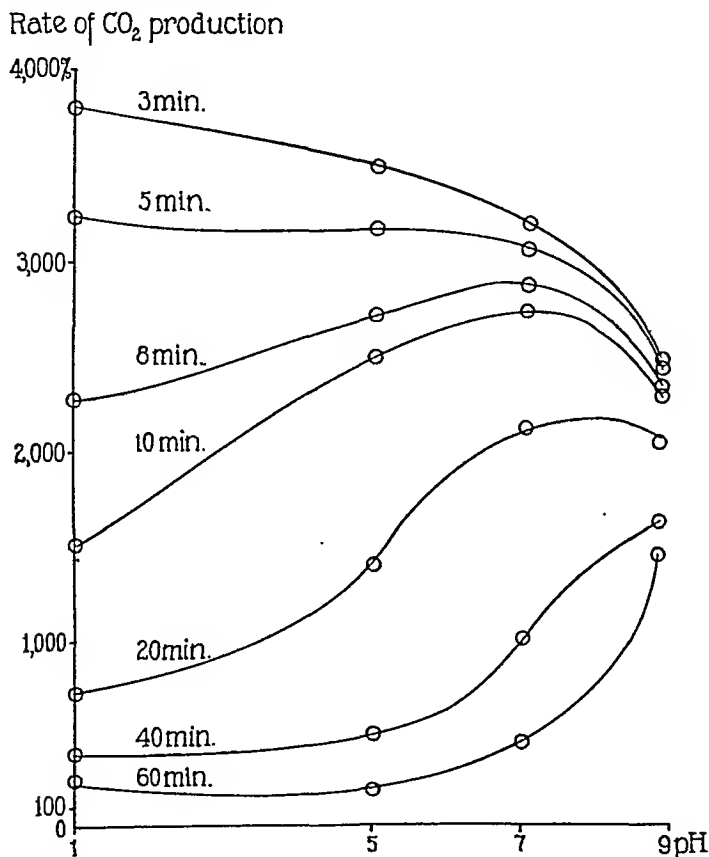


FIG. 2. Curves showing the rate of production of CO_2 by a solution of dextrose and hydrogen peroxide as related to the acidity of the solution.

the apparatus and accordingly the ordinate of the alkali curve in Fig. 1 was made equal to two-thirds the ordinate of the neutral curve.

From these experiments it was found that the production of CO_2 in the alkaline solution was at first below that at neutrality, but the fall in production was less rapid, and as will be seen from Figs. 1 and

2 the rate was higher at the end of an hour in the alkaline solution than in the neutral solution. The decrease in production of CO_2 in the alkaline solution is not so great as that shown by the curve, because in taking more than one reading the solution had to be made alkaline again by adding more NaOH , and this produced a buffer action, which increased with every reading.

It is evident that during the first part of the experiment the production of CO_2 resembles that of the organism in being greater in an acid than in a neutral medium, but less in an alkaline medium than at neutrality. It should be noted that the increase of rate in acid followed by a decrease is also observed in the case of *Penicillium*.

The falling off of the rate in the latter part of the experiment might be due to a decrease in the amount of some substance. Evidently this is not the sugar; it is doubtful whether it is the hydrogen peroxide, since titration with permanganate as well as the catalase test shows that the hydrogen peroxide has hardly decreased at all by the time the rate has fallen off. It might possibly be an active form of hydrogen peroxide or a catalyzer. It is of course possible that the falling off may be due to the formation of an inhibitory substance.

According to Spoehr⁶ there is no reaction between glucose and hydrogen peroxide in a neutral solution, but in a 0.5 M KOH solution 2 gm. of glucose had been completely used up at the end of 3 days, forming CO_2 , formic acid, glycollic acid, and α -hydroxymethyl-d-arabonic acid. As far as the writer is aware no work has been done with acid solutions.

It is probable that the reason why Spoehr did not notice any production of CO_2 in the neutral solution was because the amount is very small and the production lasts only a short time, while in the alkaline solutions the production continues for a longer time.

SUMMARY.

A neutral solution of dextrose and hydrogen peroxide acts like *Penicillium chrysogenum* in producing an increased amount of CO_2 upon the addition of acid, but not upon the addition of alkali.

⁶ Spoehr, H. A., *Am. Chem. J.*, 1910, xliii, 227.

DYNAMICS OF NERVE CELLS.

I. THE TEMPERATURE COEFFICIENT OF THE NEUROGENIC RHYTHM OF THE HEART OF *LIMULUS POLYPHEMUS*.

BY WALTER E. GARREY.

(From the Physiological Laboratory of the Tulane University Medical School,
New Orleans.)

(Received for publication, June 1, 1920.)

The temperature coefficient of the rate of heart beat has been determined by many investigators on various animals both vertebrate and invertebrate.¹ In all it was found that the coefficient for 10°C. was approximately 2 in the intermediate ranges of temperature, greater at lower temperatures, and somewhat less at high temperatures.

In none of these determinations has it been possible, owing to the character of the hearts worked with, to determine whether the results were due to an effect of temperature on the coefficient of ganglionic activity, of muscular activity, or of both.

It has therefore seemed of importance to determine whether variations of temperature, affecting ganglion cells alone, would give temperature coefficients of the same order of magnitude as those obtained on the whole heart.

A suitable preparation for this purpose is the excised heart of *Limulus polyphemus*, the beats of which have been shown by Carlson to be purely neurogenic.² Carlson has also described methods by which the ganglion can be separated from the muscle and independently subjected to variations of temperature while the muscle records the beats.

¹ For a general review of the literature of this subject see Kanitz, A., *Temperatur und Lebensvorgänge*, Berlin, 1915. Loeb, J., *The Organism as a whole, from a physicochemical viewpoint*, New York, 1916. Snyder, C. D., *Ann. J. Physiol.*, 1911, xxviii, 167.

² Carlson, A. J., *Ann. J. Physiol.*, 1905-06, xv, 220; also *Ergebn. Physiol.*, 1909, viii, 427.

The ganglion of the heart of *Limulus polyphemus* occupies a median dorsal position on that organ; the nerve cells occupy a position over the posterior five or six segments of the heart and are connected with the anterior muscular segments by a median and two lateral nerves. This ganglion, which may be 10 or 15 cm. in length, can be dissected from the underlying tissue with ease and maintain functional connection with the muscle of the anterior segments.

In the experiments to be described a method was finally adopted in which a Dewar flask contained an immersion fluid, either sea water or *Limulus* blood serum. A system of glass tubes provided for renewal of the fluid at different temperatures which were recorded by a standard thermometer graduated to 0.1°C . Either the posterior segments of the whole heart, or the dissected ganglion, depended into the fluid through an opening in a paraffined cap. The two anterior segments were pinned to the cap, enclosed in a moist chamber, and kept at a constant temperature. The contractions of the anterior segments were graphically recorded and served as an index not only of the rate but of the effective strength of the impulses reaching the muscles. The study in its ramifications has extended to about 200 *Limulus* hearts.

Observations on the Whole Heart.

At Beaufort, N. C., the laboratory sea water was 27.7°C . and the average rate of 60 hearts was 23 beats per minute, while, at Woods Hole, the laboratory sea water was 20.1°C . and the average rate of 48 hearts was 11.6 per minute. A temperature coefficient of about 2.6 (Q_{10}) is obtained from these figures, calculating for the 10° interval. The individual hearts show wide variations in rate, and since the sea water of the two localities differs somewhat in concentration, this average coefficient for the whole heart can be considered only an approximation.

To illustrate the magnitude of the temperature coefficient of the whole heart for what may be considered a fairly normal range of temperature, ten experiments have been selected from our series—experiments in which it so happened that observations were made at exactly 15 and 25°C . The results are given in Table I. The experiments given in Table I show that the whole heart of *Limulus*, subjected to

15 and 25°C. respectively, has rates giving an average temperature coefficient (Q_{10}) equal to 2.23. This indicates that the rate is determined by the alteration of a chemical process. The coefficient is quite in conformity with that reported for other rhythmic biological processes for this range of temperature.

TABLE I.

Rate per min. at		Temperature coefficient. (Q_{10})
15°C.	25°C.	
6	15	2.5
6.1	12	1.9
9	23	2.4
7.5	14.2	1.8
8	19	2.3
8.5	17	2.0
5	12	2.4
6.8	13.5	2.0
7.2	20	2.7
7	16	2.3
Average...7.1	16.17	2.23

In order to obtain a more comprehensive conception of the variation in the temperature coefficient of the whole heart subjected to different temperatures, summaries of some experiments are given below. The first shows the effect of cooling the heart to -2°C . and then progressively warming in a single but typical experiment.

Temperature range. °C.	Temperature coefficient. (Q_{10})	Temperature range. °C.	Temperature coefficient. (Q_{10})
8 to -2	3.7	25 to 15	2.8
10 " 0	3.3	28 " 18	2.5
13 " 3	3.2	30 " 20	2.2
15 " 5	3.1	33 " 23	1.9
18 " 8	3.2	35 " 25	1.7
20 " 10	3.0	38 " 28	1.5
23 " 13	2.9		

The progressive change from a large coefficient at low temperatures to the smaller values at high temperatures is not always as uniform

as illustrated in this experiment, but the coefficients at very low temperatures are usually larger than those recorded above.

Extremes of temperature may alter the value of temperature coefficients subsequently determined. It seems best in view of this fact to show separately the effects of depression and of elevation of the temperature starting with the normal temperature of the sea water. Each series thus is based on observations only on one side of the normal temperature, *i.e.* between it and a single limiting temperature, and thus the secondary effects of excessive heat or cold are avoided. In Table II the results of ten experiments are given in each of which the posterior seven segments of the whole heart with its ganglion were subjected to temperature variations.

TABLE II.

Temperature range.	Temperature coefficient (Q_{10}).						Temperature range.	Temperature coefficient (Q_{10}).			
	Experiment 1.	Experiment 2.	Experiment 3.	Experiment 4.	Experiment 5.	Experiment 6.		Experiment 7.	Experiment 8.	Experiment 9.	Experiment 10.
°C.							°C.				
-2 to +8	6.0	4.6			7.6	7.2	20 to 30	2.3	2.5	1.8	
0 " 10	3.5	3.9	4.1	3.7	5.4	5.0	21 " 31	2.3	2.2		2.0
3 " 13		3.6		2.7			23 " 33		1.9	1.9	2.1
5 " 15	2.8	3.1	3.3	2.2	2.8	3.2	25 " 35	1.8	1.7		1.92
8 " 18		3.2		2.3	2.6		27 " 37				
10 " 20	2.5	2.8	3.0	2.0	2.66	3.0	28 " 38	1.6	1.5	1.7	1.67
11 " 21					2.5						

Observations on the Ganglion.

We may now compare the above results with those obtained by varying the temperature of the ganglion alone after dissecting it free from all adherent muscle tissue except the anterior segment. It would seem best for purposes of comparison with the results obtained above on the whole heart to observe the same precautions and to avoid the effects due to exposure of the ganglion to excessive heat or cold. The results tabulated in Tables III and IV are thus strictly comparable to those given in Table II since they show the simple effect of a progressive change in the temperature of the ganglion above or below the initial normal temperature of 20°C. In order to illus-

TABLE III.

Effects of Cooling the Heart Ganglion Alone.

Experiment.	Temperature.	Rate per min.	Coefficient for 10°C.	
			Temperature range.	(Q ₁₀)
1.	°C.		°C.	
	20	17	20 to 10	2.2
	17	13	17 " 7	2.9
	15	11.7	15 " 5	2.9
	10	6.2	10 " 0	4.3
	7	4.4	7 " -2	4.5
	5	4	5 " -2	7.2
	0	1.4		
2	-2	1		
	20	8.6	20 to 10	1.9
	15	6.4	15 " 10	2.1
	10	4.4	15 " 5	2.1
	5	3	10 " 0	2.9
3	0	1.5	5 " 0	4.0
	20	16	20 to 10	2.5
	15	10.5	15 " 5	2.8
	10	6.2	10 " 0	3.5
	8	5	8 " -2	6.0
	5	3.7	5 " -2	8.9
	0	1.7		
4	-2	0.8		
	21.6	11.8	21.6 to 11.6	2.8
	16.5	7.0	16.5 " 6.5	3.3
	11.6	4.2	11.6 " 1.6	5.6
	6.5	2.3		
5	1.6	0.74		
	19.7	12.6	19.7 to 10	2.3
	16	9	16 " 6	2.1
	12	6.6	12 " 2	2.2
	10	5.4	10 " 0	2.4
	6	4.3		
	2	3		
	0	2.2		

trate the widest range of variation in experimental results, experiments on eight different animals were selected arbitrarily. As was expected the cardiac rate was slow when the ganglion was cooled and fast when it was warmed. In the lower ranges of temperature the temperature coefficient (Q_{10}) is well above 2 and at very low tempera-

TABLE IV.

Effects of Warming the Heart Ganglion Alone.

Experiment.	Temperature.	Rate per min.	Coefficient for 10°C.	
			Temperature range.	(Q_{10})
6	°C.		°C.	
	20	8	20 to 30	2.5
	22.5	12	22.5 " 32.5	2.1
	25	14	25 " 35	2.0
	28	20	28 " 38	1.6
	30	23		
	32.5	26		
	35	28		
	38	32		
7	20	12	25 to 30	2.2
	22	15	22 " 32	2.0
	25	17.5	25 " 35	1.9
	27	20	27 " 37	2.1
	30	27		
	32	31		
	35	33		
	37	35		
8	21	18.3	21 to 26	2.0
	26	26.8	21 " 31	1.8
	31	33	26 " 36	1.5
	36	40		

tures may be as large as 9. This places the process upon which the rate of the rhythmic ganglionic discharge depends unequivocally within the class of chemical reactions. The decrease in the coefficient at higher temperatures is the rule in both biological and chemical reactions and does not militate against this interpretation. The results in Tables III and IV are illustrated in Fig. 1.

If we now compare the results obtained on the whole heart with those obtained when the ganglion alone is subjected to changes of temperature we are struck with the fact that there is not a single feature of the temperature coefficients which will serve to differen-

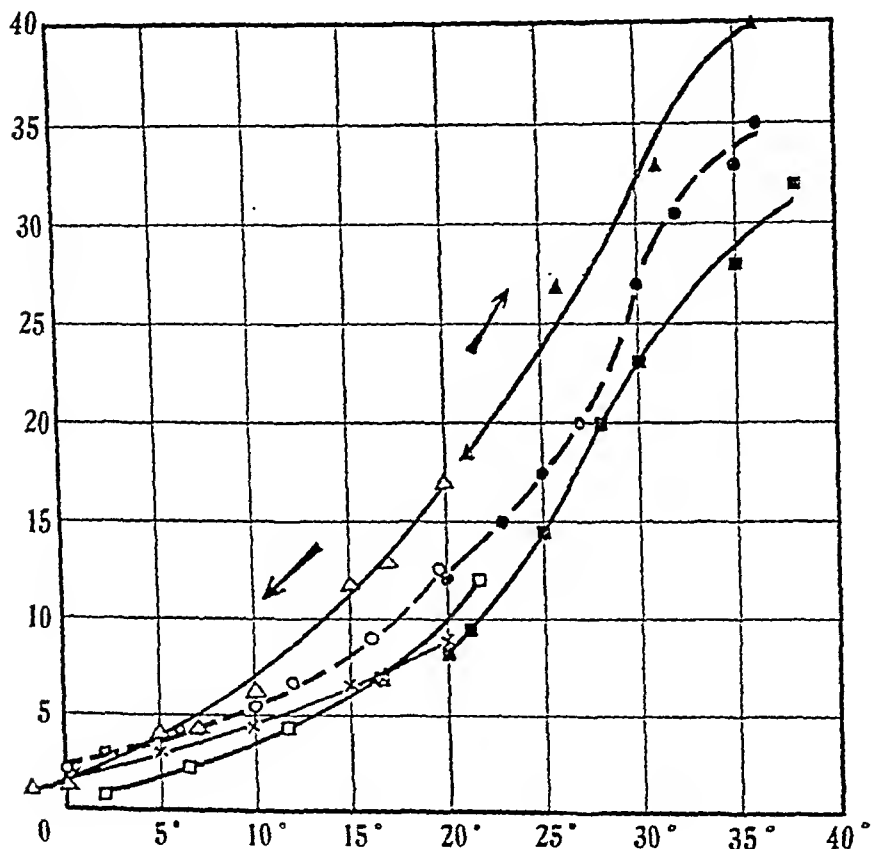


FIG. 1. Curves for the rates plotted against temperature. Data from Tables III and IV. Δ , \circ , \times , and \square correspond to 1, 5, 2, and 4 respectively and show the effects of progressive cooling; \blacktriangle , \bullet , and \blacksquare correspond to 8, 7, and 6 respectively.

tiate one from the other. The magnitude of the temperature coefficient and its variations are parallel in the two cases and we are justified in concluding that there is the same typical temperature coefficient for the rate of the heart beat of *Limulus* when the ganglion alone is

Deaths

Daniel Percy Hickling ☉ Washington, D. C.; Georgetown University School of Medicine, Washington, 1884; professor of psychiatry and neurology and formerly clinical professor at his alma mater; an Affiliate Fellow of the American Medical Association; member of the American Psychiatric Association, Washington Society for Mental and Nervous Diseases, National Psychopathological Association and the Washington Academy of Sciences; member of the committee on arrangements of the International Congress of Mental Hygiene; alienist for the District of Columbia, 1914-1933; professor of medical jurisprudence, National University Law School; formerly attending specialist, neuropsychiatric service, U. S. Veterans Bureau; served as contract surgeon for the U. S. Army; aged 75; served in various capacities on the staffs of the Providence Hospital, Gallinger Municipal Hospital, St. Elizabeths Hospital and the Georgetown University Hospital, where he died, January 10, of pneumonia, following the amputation of a leg.

Elwood Emerson Downs ☉ Woodbury, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1913; representative of the Section on Radiology to the Scientific Exhibit of the American Medical Association; past president and secretary of the Gloucester County Medical Society, and in 1938 received the society's medal of honor for his contributions as poet laureate of the physicians of Gloucester County; fellow of the American College of Radiology; past president of the Philadelphia Roentgen Ray Society and the Radiological Society of New Jersey; member of the American Roentgen Ray Society and the Radiological Society of North America; president of the board of education; radiologist to the Underwood Hospital, Woodbury; Jeanes Hospital, Philadelphia, and the Salem (N. J.) County Memorial Hospital; author of numerous articles; aged 48; died suddenly, March 18, of embolism following an appendectomy.

George Van Ness Dearborn, Maplewood, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1893; member of the American Psychiatric Association, American Philosophical Society, American Psychological Association and other scientific societies; in 1899 assistant in physiology at the Harvard University Medical School, Boston; at various times professor, and director of the laboratory of physiology, Tufts College Medical and Dental schools; consulting psychologist to the Forsyth Dental Infirmary for Children, Boston; served during the World War; on the staffs of various veterans administration facilities; at one time on the staffs of the Boston City Hospital and the Augusta (Me.) State Hospital; author of "Textbook of Human Physiology," 1908; editor of "Psychological Index"; aged 69; died, Dec. 12, 1938, in New York.

Carl Boettiger ☉ Flushing, N. Y.; Cornell University Medical College, New York, 1903; member of the House of Delegates of the American Medical Association in 1935-1936; fellow of the American College of Physicians; member of the Society of American Bacteriologists and the American Society of Clinical Pathologists; past president of the Medical Society of Queens County; served during the World War; clinical professor of medicine at the New York University College of Medicine; member of the city board of health; visiting physician to St. John's Long Island City (N. Y.) Hospital and the Mary Immaculate Hospital, Jamaica, N. Y.; visiting physician and director of the medical service, Queens General Hospital; aged 59; died, February 1, at his home in Forest Hills of coronary thrombosis.

Donald Maclean ☉ Reno, Nev.; University of Edinburgh Faculty of Medicine, Edinburgh, Scotland, 1898; fellow of the American College of Surgeons; past president of the Washoe County Medical Society; veteran of the Spanish-American War; surgeon for the Leadville, Colo., mines, 1900-1905; chief medical advisor of the Nevada Industrial Commission, 1913-1927; physician to the Nevada State Prison, 1910-1923; surgeon for the Nevada State Orphans' Home; chief of the staff of St. Mary's Hospital; member of the board of trustees of the Washoe General Hospital; aged 66; died, January 4, of coronary thrombosis.

Ellison Lloyd Ross ☉ Waukegan, Ill.; Northwestern University Medical School, Chicago, 1918; professor of otolaryngology at his alma mater; member of the American Academy of Ophthalmology and Oto-Laryngology and the American Otolaryngological Society; fellow of the American College of Surgeons; attending otolaryngologist to the Passavant Memorial Hospital, Chicago, and Veterans' Administration Facility, North Chicago; on the staffs of the Victory Memorial and St. Therese's hospitals, Waukegan; aged 57; died, Dec. 21, 1938, of heart disease.

Byron Ulysses Richards ☉ Pawtucket, R. I.; Dartmouth Medical School, Hanover, N. H., 1893; an Affiliate Fellow of the American Medical Association; formerly commissioner of health, state registrar and executive secretary of the Rhode Island State Board of Health; past president of the Federation of State Medical Boards of the United States; formerly vice president of the State and Provincial Health Authorities of North America; for many years police surgeon and city physician; aged 72; died, February 15, of mitral insufficiency.

William Cosgrove Hunsicker, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1895; clinical professor of urology at his alma mater; fellow of the American College of Surgeons; director of health of Philadelphia; for many years member of the state senate; urologist to the Hahnemann Medical College and Hospital, St. Luke's and Children's hospitals, Philadelphia, Homeopathic State Hospital, Allentown, and consulting urologist to the Pottstown (Pa.) Homeopathic Hospital; aged 65; died, January 10, of heart disease.

Harry Stearns Willard ☉ Paterson, N. J.; New York Homeopathic Medical College and Hospital, New York, 1896; fellow of the American College of Surgeons; past president of the Passaic County Medical Society; for many years member of the board of education of Ridgewood; ophthalmologist to the "Bergen Pines," Oradell; Paterson General Hospital and Paterson Eye and Ear Infirmary, Paterson, and Good Samaritan Hospital, Suffern, N. Y.; aged 62; died, Dec. 11, 1938, at his home in Ridgewood of chronic myocarditis.

Ephraim Roland Mulford ☉ Burlington, N. J.; University of Virginia Department of Medicine, Charlottesville, 1903; member of the House of Delegates of the American Medical Association, 1929-1937; past president of the Medical Society of the State of New Jersey and the Burlington County Medical Society; was surgeon to the Pennsylvania Railroad in his district; on the staff of the Burlington County Hospital, Mount Holly; aged 58; died, March 10, of coronary occlusion while visiting friends in Charlottesville, Va.

Joseph Manuel Rector ☉ Jersey City, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1893; attending gynecologist to the Jersey City Medical Center; connected with the Jersey City Hospital since 1893; member of the state board of medical examiners; consulting surgeon gynecologist to the North Hudson Hospital and New Jersey State Hospital at Greystone Park; served during the World War; aged 71; died, January 10, of arteriosclerotic heart disease.

Lyman Augustus Brewer, Toledo, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1887; member of the Ohio State Medical Association; fellow of the American College of Surgeons; at one time dean and professor of surgery, Toledo Medical College; served during the World War; chief of staff, Mercy Hospital; consulting surgeon to the Women's and Children's Hospital; on the staff of St. Vincent's Hospital; aged 72; died, January 16, of heart disease.

Mary O'Malley, Buffalo; Niagara University Medical Department, Buffalo, 1897; fellow of the American College of Physicians; past president of the Medical Women's National Association; associate in psychiatry at the George Washington University School of Medicine, 1922-1929; formerly clinical director in charge of the women's service at St. Elizabeths Hospital and consultant in psychiatry at the Gallinger Municipal Hospital; aged 71; died, January 30, of cerebral hemorrhage.

Leopold Jaches ☉ New York; Columbia University College of Physicians and Surgeons, New York, 1903; formerly a lawyer; clinical professor of radiology at his alma mater; member and past president of the American Roentgen Ray Society; member of the Radiological Society of North America and American College of Radiology; served during the World War; aged 65; on the staff of the Mount Sinai Hospital, where he died, January 23.

Martin E. Sargeant ☉ Ticonderoga, N. Y.; University of Vermont College of Medicine, Burlington, 1908; at various times health officer of the towns of Putnam, Hague and Ticonderoga; health examiner in the local schools, and also acted in a similar capacity in the schools at Putnam and Hague; formerly on the staff of the Moses Ludington Hospital; aged 53; died, Dec. 30, 1938, of pulmonary tuberculosis and diabetes mellitus.

Louis Franklin ☉ Jersey City, N. J.; Columbia University College of Physicians and Surgeons, New York, 1903; fellow of the American College of Surgeons; surgeon to the Margaret Hague Maternity Hospital and co-founder and president of the staff of the Fairmount Hospital, Jersey City; president of the staff of the Hudson County Hospital, Secaucus; aged 56; died, Dec. 20, 1938, of heart disease and hypertensive nephritis.

Ralph Dumphy Simons ♂ Gardiner, Maine; Medical School of Maine, Portland, 1899; past president of the Kennebec County Medical Society; member of the board of registration of medicine; formerly member of the state legislature; for many years school physician; aged 61; on the staff of the Gardiner General Hospital, where he died, Dec. 25, 1938, of intestinal obstruction due to adhesions.

Edward S. Newell ♂ Pelham Manor, N. Y.; University of the City of New York Medical Department, 1892; on the courtesy staff of the Mount Vernon (N. Y.) Hospital since 1910, and on the attending staff from 1890 to 1910; for many years on the associate staff and attending staff of the New Rochelle (N. Y.) Hospital; aged 70; died, Dec. 12, 1938, of coronary thrombosis.

Michael Simon Granelli, Hoboken, N. J.; Jefferson Medical College of Philadelphia, 1906; member of the Medical Society of New Jersey; veteran of the Spanish-American and World wars; school physician; on the staff of St. Mary's Hospital; aged 57; died, Dec. 22, 1938, in the Bayonne (N. J.) Hospital of postoperative pneumonia and carcinoma of the bladder.

William James Adams ♂ Omaha; Creighton University School of Medicine, Omaha, 1924; instructor in surgery and at various times assistant in anatomy and instructor in medicine at his alma mater; on the staff of the Creighton Memorial St. Joseph Hospital; served during the World War; aged 40; died, Dec. 21, 1938, of hypertension and cerebral hemorrhage.

Frank Joseph Savage ♂ Cleveland; Western Reserve University School of Medicine, Cleveland, 1928; demonstrator in medicine at his alma mater; on the visiting staffs of the Deaconess Hospital, Grace Hospital and St. Vincent Charity Hospital; aged 38; died, Dec. 10, 1938, of adynamic ileus, partial intestinal obstruction and ulcerative colitis.

Levi Franklin Wagner, Reading, Pa.; University of Vermont College of Medicine, Burlington, 1888; Medico-Chirurgical College of Philadelphia, 1890; member of the Medical Society of the State of Pennsylvania; formerly county coroner and prison physician; aged 75; died, Dec. 14, 1938, in the Reading Hospital of cardiac decompensation.

Byron Coleman Meacher, Portage, Wis.; Rush Medical College, Chicago, 1880; member of the State Medical Society of Wisconsin; fellow of the American College of Surgeons; chief of staff, St. Savior's General Hospital; associate member of the staff, St. Mary's Hospital, Columbus; aged 81; died, Dec. 15, 1938, of Parkinson's disease.

Henry G. Chritzman ♂ Greencastle, Pa.; Jefferson Medical College of Philadelphia, 1926; on the staffs of the Washington (Pa.) County Hospital, Waynesboro (Pa.) Hospital and the Chambersburg (Pa.) Hospital; member of the school board; aged 37; died, Dec. 10, 1938, in the Jefferson Hospital, Philadelphia, of carcinoma.

Edgar Quinby Bullock, Wilmington, Del.; Hahnemann Medical College and Hospital of Philadelphia, 1905; member of the Medical Society of Delaware; formerly secretary of the Delaware Homeopathic Board of Medical Examiners; on the staff of the Homeopathic Hospital; aged 57; died, February 8, of coronary thrombosis.

Lewis Olds Tayntor ♂ Conneaut Lake, Pa.; University of Maryland School of Medicine, Baltimore, 1926; formerly connected with the Maryland State Health Department as deputy state health officer of three counties; on the staff of the Meadville (Pa.) City Hospital; aged 53; died, Dec. 28, 1938, of cerebral hemorrhage.

William Reid Thompson, Mackville, Ky.; Kentucky University Medical Department, Louisville, 1905; member of the Kentucky State Medical Association; past president of the Washington County Medical Society; bank president; aged 62; died, Dec. 24, 1938, in the A. D. Price Memorial Hospital, Harrodsburg.

Robert Roy Robinson, Hallsville, Mo.; University of Missouri School of Medicine, Columbia, 1901; member of the Missouri State Medical Association; at one time health officer of Grant County, New Mexico, and Boone County, Mo.; aged 59; died, Dec. 23, 1938, in the Barnes Hospital, St. Louis, of tuberculosis.

Edward Gager Fox, Wethersfield, Conn.; University of the City of New York Medical Department, 1883; member of the Connecticut State Medical Society; health officer for fifty years; formerly physician to the state prison; aged 79; died, Dec. 26, 1938, of cerebral thrombosis, arteriosclerosis and diabetes mellitus.

William Truman Stone, Park Rapids, Minn.; Hahnemann Medical College and Hospital, Chicago, 1882; College of

Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; at various times member of the state legislature; aged 83; died, Dec. 26, 1938, of angina pectoris.

Walter C. Ashworth ♂ Greensboro, N. C.; College of Physicians and Surgeons, Baltimore, 1892; past president of the Guilford County Medical Society; on the staff of the Glenwood Park Sanitarium and formerly owner; aged 70; died, Dec. 16, 1938, in the Wesley Long Hospital of carcinoma of the bladder.

Willard Clark Sanford ♂ Chicago; Chicago Medical College, 1890; formerly associate professor of surgery, University of Illinois College of Medicine; fellow of the American College of Surgeons; on the staff of St. Elizabeth's Hospital; aged 73; died, Dec. 12, 1938, of coronary thrombosis and hypertension.

Henry M. Ogilbee, Manitou Springs, Colo.; Western Reserve University Medical Department, Cleveland, 1882; member of the Colorado State Medical Society; at various times mayor; aged 82; died, Dec. 6, 1938, in the Beth El Hospital, Colorado Springs, of carcinoma of the urinary bladder.

Maly Emanuel Renner, Lagro, Ind.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1881; member of the Indiana State Medical Association; aged 78; died, Dec. 12, 1938, in the Wabash County Hospital, Wabash, of injuries received when struck by an automobile.

Arey Covington Everett ♂ Rockingham, N. C.; University of Maryland School of Medicine, Baltimore, 1897; secretary and past president of the Richmond County Medical Society; for many years a member of the county board of health; aged 65; died, Dec. 26, 1938, of coronary thrombosis.

Thomas McCullough Maxwell ♂ Butler, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1903; for many years member of the board of health and school board; formerly on the staff of the Butler County Memorial Hospital; aged 60; died, Dec. 7, 1938, of cerebral hemorrhage.

John Kavanaugh Bullock ♂ Jackson, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1926; member of the American Academy of Pediatrics; formerly vice president of the Mississippi State Pediatric Society; aged 39; died, Dec. 26, 1938, of cerebral hemorrhage.

David William Van Camp, Plainfield, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; past president of the Cumberland County Medical Society; on the staff of the Carlisle (Pa.) Hospital; aged 67; died, Dec. 30, 1938, of arteriosclerosis and hypertension.

Edward Loring Marr ♂ Melrose, Mass.; Tufts College Medical School, Boston, 1911; veteran of the Spanish-American War; formerly school physician; on the staff of the Melrose Hospital; aged 61; died, Dec. 17, 1938, in the Middlesex County Sanatorium of pulmonary tuberculosis.

Maggie Letitia McCrea, Sterling, Kan.; Northwestern University Woman's Medical School, Chicago, 1891; member of the Kansas Medical Society; past president of the Rice County Medical Society; aged 74; died, Dec. 19, 1938, in the Sterling Hospital of carcinoma of the stomach.

Joseph Irwin France ♂ Port Deposit, Md.; College of Physicians and Surgeons, Baltimore, 1903; formerly state senator and United States Senator; at one time secretary of the Medical and Chirurgical Faculty of Maryland; aged 65; died, January 26, of chronic myocarditis.

George McClelland Scott, Waynesburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1891; member of the Medical Society of the State of Pennsylvania; for several years member of the school board; aged 73; died, Dec. 9, 1938, of diabetes mellitus and pancreatitis.

Edward Whitfield Tolley, Grand Rapids, Mich.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; member of the Michigan State Medical Society; aged 68; died, Dec. 17, 1938, in St. Mary's Hospital of cerebral hemorrhage.

Marion Whitacre ♂ Cincinnati; Medical College of Ohio, Cincinnati, 1899; formerly clinical instructor in medicine at his alma mater; served during the World War; for many years on the staff of the Christ Hospital; aged 67; died, Dec. 3, 1938, of myocarditis and arteriosclerosis.

Lenus Albert Carl, Newport, Pa.; Baltimore Medical College, 1907; member of the Medical Society of the State of Pennsylvania; formerly secretary of the Perry County Medical Society; aged 60; died, Dec. 1, 1938, in the Harrisburg (Pa.) Hospital of coronary thrombosis.

Charles Edward Holleman, Winston-Salem, N. C.; Jefferson Medical College of Philadelphia, 1932; member of the Medical Society of the State of North Carolina; on the staff of the City Memorial Hospital; aged 34; died, Dec. 20, 1938, of pulmonary tuberculosis.

James J. Cavaney, Milwaukee; Rush Medical College, Chicago, 1879; member of the State Medical Society of Wisconsin; formerly on the staffs of the Milwaukee County Hospital and the Misericordia Hospital; aged 85; died, Dec. 30, 1938, of arteriosclerosis.

Ulysses Irenaeus Tope, Lamartine, Ohio; Ohio Medical University, Columbus, 1895; member and past president of the county board of health and member of the local board of education; aged 68; died, Dec. 15, 1938, following an operation for sarcoma of the scapulum.

Clarence William Weller, Austin, Texas; University of Texas School of Medicine, Galveston, 1913; member of the State Medical Association of Texas; served during the World War; aged 55; died, Dec. 5, 1938, of peritonitis following intestinal obstruction.

John Nicholas Baskett, Hannibal, Mo.; Bellevue Hospital Medical College, New York, 1879; member of the Missouri State Medical Association; on the staff of the Levering Hospital; at one time mayor; aged 85; died, Dec. 29, 1938, of coronary thrombosis.

Grover Cleveland McCormack, Joplin, Mo.; St. Louis College of Physicians and Surgeons, 1910; served during the World War; aged 49; died, Dec. 21, 1938, in the Veterans Administration Facility, Fayetteville, Ark., of pulmonary edema and nephritis.

George W. Pfromm & Philadelphia; Medico-Chirurgical College of Philadelphia, 1894; formerly assistant professor of therapeutics at his alma mater; consulting physician to the German Protestant Home; aged 69; died, Dec. 4, 1938, of carcinomatosis.

Robert Allen Cavitt, Morrison, Okla.; St. Louis College of Physicians and Surgeons, 1896; member of the Oklahoma State Medical Association; county health officer; formerly member of the state legislature; aged 67; died, Dec. 24, 1938, in a hospital at Pawnee.

Emery Treckell, Wellington, Kan.; Northwestern University Medical School, Chicago, 1910; member of the Kansas Medical Society; county health officer; aged 61; died, Dec. 8, 1938, in the Hatcher Hospital of peptic ulcer, cerebral hemorrhage and uremia.

Frederick Snow Canedy, Wellfleet, Mass.; Boston University School of Medicine, 1891; member of the Massachusetts Medical Society; formerly member of the school committee; aged 70; died, Dec. 12, 1938, of cerebral arteriosclerosis and uremia.

Alpha John Wedel, Hesston, Kan.; University Medical College of Kansas City, Mo., 1910; member of the Kansas Medical Society; aged 56; died, Dec. 25, 1938, in the Bethel Deaconess Hospital, Newton, of lobar pneumonia and cerebral hemorrhage.

William Amos Trivette & Hamptonville, N. C.; Medical College of Virginia, Richmond, 1916; served during the World War; medical director and superintendent of the Trivette Clinic; aged 50; died, Dec. 20, 1938, of lobar pneumonia and influenza.

Clarence Banjay Wasson, Bellevue, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901; member of the Michigan State Medical Society; also a minister; aged 73; died, Dec. 6, 1938, of senility.

George Edwin Lewis, Rockville, Md.; Southern Homeopathic Medical College, Baltimore, 1901; veteran of the Spanish-American and World wars; aged 69; died, Dec. 30, 1938, of arteriosclerosis, hypertension and myocarditis.

John Boyd McKeown, Great Falls, S. C.; Medical College of the State of South Carolina, Charleston, 1909; member of the South Carolina Medical Association; aged 52; died, Dec. 23, 1938, of myocarditis and pulmonary infarction.

Calvin Grant Stookey, Mechanicsville, Iowa; Illinois Medical College, Chicago, 1895; member of the Iowa State Medical Society; aged 73; died, Dec. 12, 1938, in St. Luke's Hospital, Cedar Rapids, of hypostatic pneumonia.

George Seibert Leshner, Eastport, Idaho; University of Pennsylvania Department of Medicine, Philadelphia, 1890; acting assistant surgeon, U. S. Public Health Service; aged 76; died, Dec. 16, 1938, in Spokane, Wash.

Arthur Glenn Davis, Senath, Mo.; St. Louis University School of Medicine, 1928; member of the Missouri State Medical Association; aged 34; died, Nov. 25, 1938, in a hospital at Paragould, Ark., of gastric carcinoma.

Jasper William Collier, Wellsville, N. Y.; Long Island College Hospital, Brooklyn, 1880; past president of the Allegany County Medical Society; for many years health officer; aged 86; died, Dec. 29, 1938, of myocarditis.

William Emerson Tucker, Ipswich, Mass.; Long Island College Hospital, Brooklyn, 1870; formerly member of the school committee; aged 89; died, Dec. 3, 1938, of carcinoma of the stomach and arteriosclerosis.

Lucius Sherman Nichols & Geneva, Ala.; Medical College of Alabama, Mobile, 1897; secretary of the Geneva County Medical Society; formerly county health officer; aged 66; died Dec. 20, 1938, of pneumonia.

Clarence Mansur Westerman, St. Louis; Barnes Medical College, St. Louis, 1906; served during the World War; aged 52; died, Nov. 23, 1938, in the Veterans Administration Facility Jefferson Barracks, Mo.

William Eli Morris, Georgiana, Ala.; Medical College of Alabama, Mobile, 1897; member of the Medical Association of the State of Alabama; aged 70; died, Dec. 6, 1938, of uremia.

Phebe Russell Norris & Washington, D. C.; Columbian University Medical Department, Washington, D. C., 1891; aged 78; died, Dec. 11, 1938, of chronic arthritis and myocarditis.

James C. Harris, Oakfield, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1904; aged 56; died, Dec. 5, 1938, in the Phoebe Putney Memorial Hospital, Albany.

Harry Cordover & New York; University and Bellevue Hospital Medical College, New York, 1934; on the staff of the Morrisania City Hospital; aged 30; died, Nov. 29, 1938.

David Ulysses Surface, Grand Rapids, Minn.; Sioux City (Iowa) College of Medicine, 1896; aged 70; died, Dec. 2, 1938, of myocarditis, hypertension and arthritis.

Martha V. Thomas, South Bend, Ind.; Hahnemann Medical College and Hospital, Chicago, 1896; aged 83; died in December 1938 of heart disease and hypertension.

Joseph Eli Bird & New Albany, Ind.; Hospital College of Medicine, Louisville, Ky., 1897; on the staff of St. Edward's Hospital; aged 68; died, Dec. 8, 1938.

James Henry Thomason, Guntersville, Ala.; University of Tennessee Medical Department, Nashville, 1907; aged 56; died, Dec. 4, 1938, of heart disease.

John Edgar Tidwell, Andrews, N. C.; Chattanooga (Tenn.) Medical College, 1903; aged 72; died, Dec. 3, 1938, of cerebral hemorrhage and pernicious anemia.

Fred Harvey Bly, Red Bluff, Calif.; Northwestern University Medical School, Chicago, 1911; aged 72; died, Nov. 12, 1938, of endocarditis.

Calvin F. Moranville, Hemmingford, Neb. (licensed in Nebraska in 1891); aged 88; died at Bayard in November 1938 of senility.

John Henry George Youell, Aylmer (West), Ont., Canada; University of Toronto Faculty of Medicine, 1892; died, Nov. 28, 1938.

Leslie Roy Aiken, Courtright, Ont., Canada; Western University Faculty of Medicine, London, 1913; aged 51; died, Nov. 16, 1938.

Rosaire Georges Matte, Quebec, Que., Canada; Laval University Faculty of Medicine, Quebec, 1884; aged 77; died Oct. 30, 1938.

Frank William Ramsey, Somerville, Mass. (licensed in Massachusetts in 1901); aged 61; died, Nov. 28, 1938, of heart disease.

George William Stiffer, Denver; Missouri Medical College, St. Louis, 1887; aged 80; died, Nov. 17, 1938, of heart disease.

Andrew Jackson Farley, Irondale, Ala.; Atlanta Medical College, 1890; aged 82; died, Nov. 24, 1938, of cerebral hemorrhage.

Eugene Manigault Baker Jr., Patterson, Ga.; Jefferson Medical College of Philadelphia, 1926; aged 38; died, Nov. 2, 1938.

Garrett White, Chapel Hill, Tenn.; University of Tennessee Medical Department, Nashville, 1889; aged 73; died, Nov. 29, 1938.

Samuel Jacob Morris, Mount Elgin, Ont., Canada; Western University Faculty of Medicine, London, 1900; died, Nov. 5, 1938.

James G. Merrison, Sarnia, Ont., Canada; Faculty of Medicine of Trinity College, Toronto, 1878; died, Nov. 24, 1938.

Herman F. Ratte, Los Angeles; Missouri Medical College, St. Louis, 1886; aged 74; died, Nov. 21, 1938, of myocarditis.

Melville Wright Staples, Pleasant Plains, Ill.; St. Louis Medical College, 1884; aged 88; died, Dec. 8, 1938, of uremia.

Martin G. Fox, Thurmont, Ind.; University of Medicine, Indianapolis, 1898; died, Dec. 1, 1938.

Bureau of Investigation

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consigner; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Anogon.—Anogen, Inc., New York. Composition: Essentially furfural. Fraudulently represented as a cure for delayed menstruation.—[N. J. 27226; October 1937.]

Bacon's Ferretone Tonic.—Max E. Bacon, trading as Ferretone Co., Wichita, Kan. Composition: Chiefly powdered iron, chalk, phosphates, plant extractives, strychnine and a phenolic compound. "System purifier" and tonic," etc. Fraudulent therapeutic claims.—[N. J. 27135; August 1937.]

Big-Chief Herbs.—Spors Co., Le Center, Minn. Composition: Essentially plant material including lavender flowers and oil of mustard. For headaches, sinus, catarrh, hay fever and asthma. Fraudulent therapeutic claims.—[N. J. 27538; January 1938.]

Cadum Ointment.—Omega Chemical Co., New York. Composition: Essentially zinc oxide (20.4 per cent), sulfur (4.6 per cent), salicylic acid and oil of cade, in a petrolatum and wax base. Proportions of zinc oxide and sulfur falsely stated on label. Fraudulently represented to cure skin diseases, hemorrhoids, etc.—[N. J. 27364; December 1937.]

Cal-O-San Stomach Tablets.—G. Brewerton, Fort Browning, Mont. Composition: In each tablet, bismuth subcarbonate (10½ grains), chalk (6 grains), baking soda (10½ grains), starch and peppermint oil. For stomach ulcers, etc. Fraudulent therapeutic claims.—[N. J. 27142; August 1937.]

Corley's (Dr.) Cor-Lax.—Buren L. Corley, trading as Dr. Corley's Products, San Francisco. Composition: Essentially plant material including senna and peppermint leaves, cascara bark and fennel seed. Fraudulently represented as a cure for excess acid, upset stomach, congested liver, cancer, tuberculosis, diabetes, kidney and heart trouble, etc.—[N. J. 27267; October 1937.]

Corley's (Dr.) Health Broth.—Buren L. Corley, trading as Dr. Corley's Products, San Francisco. Composition: Essentially plant material, including alfalfa leaf and stem, okra, tomato, red pepper, celery seed, onion, potato starch, plant tissue resembling Irish moss, starchy material, and small amounts of stem, leaf and root tissues lacking in diagnostic tissue elements. Fraudulently represented as a cure for mineral and vitamin deficiency diseases, such as stomach gas and ulcers, all digestive upsets, skin ailments, depleted blood, all forms of rheumatism, etc.—[N. J. 27267; October 1937.]

Davis (G. W.) Inflammatory Extirpator.—Charles L. Isherwood & Sons, Fall River, Mass. Composition: Essentially alcohol (69.2 per cent), red pepper, a gum, water, and volatile oils including turpentine and camphor. Fraudulently represented as a remedy for external and internal pain, coughs, asthma, croup, headache, urinary diseases, rheumatism, etc.—[N. J. 27146; August 1937.]

Dunlap's Antiseptic Liniment.—Morris Wright Medicine Co., and Dunlap Medicine Co., Memphis. Composition: Essentially alcohol (78 per cent), water, and small amounts of chloroform, extracts of plant drugs, ammonia, and volatile oils including sassafras and eucalyptol. For rheumatism, toothache, headache, diarrhea, colic, etc. Fraudulent therapeutic claims.—[N. J. 27534; January 1938.]

Elco-Rub.—Erie Laboratories, Cleveland. Composition: Essentially petrolatum, oils of eucalyptus, wintergreen and turpentine, with camphor, menthol and guaiacol. For sore throat, croup, whooping cough, rheumatism, catarrh, etc. Fraudulent therapeutic claims.—[N. J. 27360; December 1937.]

Essential Food Minerals.—H. C. Roberts Co., Sioux City, Iowa. Composition: "Essential Food Minerals" was chiefly milk sugar (97.1 per cent), with traces of potassium, sodium, calcium, magnesium, iron, manganese, copper and silicon compounds, chlorides, phosphates and sulfates; "Special Gland Food Essential Food Minerals" was chiefly milk sugar (95.6 per cent), with traces of sodium, potassium, calcium, magnesium, iron, manganese, copper and silicon compounds, chlorides, phosphates, sulfates and iodides; "Special Iodine Containing Essential Food Minerals" was chiefly milk sugar (98.2 per cent), with traces of sodium, potassium, calcium, magnesium, iron, manganese, copper and silicon compounds, chlorides, sulfates, phosphates and iodides. Fraudulently represented for "tonic" and "building-up" purposes and as remedies for numerous ailments.—[N. J. 27258; October 1937.]

Ferretone Eye Lotion.—Max E. Bacon, trading as Ferretone Co., Wichita, Kan. Composition: Boric acid, menthol and a yellow color. Fraudulently represented to cure all ordinary eye affections, excessive secretion of tears, fatigued vision, ulcerated eyelids, etc., and to prevent "serious and lamentable diseases and loss of sight."—[N. J. 27135; August 1937.]

Foot Pal.—Spors Co., Le Center, Minn. Composition: Essentially small amounts of sodium salicylate, glycerin and pine needle oil in water, colored with a green dye. Fraudulently represented as an antiseptic and a cure for blisters resulting from nail wounds.—[N. J. 27538; January 1938.]

Goba.—Vitamin Products Research Foundation, Inc., Chicago. Composition: Protein, starch, sugars and compounds of calcium and magnesium, phosphates and carbonates, with approximately 2 U. S. P. units of vitamin A per tablet. Adulterated because not up to the standard of vitamin A represented for it; misbranded because fraudulently indicated to promote health, a vigorous, robust mind and body, disease resistance, sexual impotence, etc., and to combat infections, prevent anemia and cure irritability, listlessness and beriberi.—[N. J. 27353; December 1937.]

Grandma's Medicinal Herbs.—Park Laboratory Co., Inc., San Antonio, Texas. Composition: Essentially senna and small amounts of couch grass, American saffron, caraway seed, anise seed, licorice root, sassafras bark, lavender flowers, bearberry leaves and cinnamon bark. Fraudulent therapeutic claims for its alleged "cleansing" properties.—[N. J. 27236; October 1937.]

Hain Vegetable Accessory Reducing Food.—Hain Pure Food Co., Los Angeles. Composition: An appreciable amount of seaweed material, plus some nondescript vegetable tissues. Fraudulently represented as a food for the underweight and overweight, and as supplying dietary minerals.—[N. J. 27527; January 1938.]

Harosma.—Erie Laboratories, Cleveland. Composition: Essentially phenacetin (2.5 grains), aspirin (2.7 grains) and caffeine (¼ grain), in each capsule. Adulterated and misbranded because each capsule did not contain 4 grains of phenacetin, as labeled; misbranded, further, because fraudulently represented as a cure for rose fever, rhinitis, la grippe, weeping eyes, etc.—[N. J. 27234; October 1937.]

He-Sho Antiseptic Vaginal Suppositories.—Helm Co., Benton Harbor, Mich. Composition: Essentially coco butter and boric acid, with small amounts of salicylic acid and quinine. Fraudulently represented as a preventive of leucorrhea and a germicide, and as being prescribed by eminent physicians.—[N. J. 27275; October 1937.]

Hygom.—Bloomfield Laboratories, Bloomfield, N. J. Composition: Viable micro-organisms to the amount of not less than 7 million per tablespoonful; no acidophilus bacilli found, though the label described the stuff as "The Mineral Oil Emulsion With Acidophilus." This misrepresentation constituted misbranding, as did the statement "Contains no Drugs nor Cathartics." Other claims were declared fraudulent.—[N. J. 27388; December 1937.]

Ico-Mint.—United Sales and Mfg. Co., Binghamton, N. Y. Composition: Essentially water, borax, camphor and menthol, in an ointment base. For nervous headache, sore muscles, corns and calluses, burns, "piles," etc. Fraudulent therapeutic claims.—[N. J. 27237; October 1937.]

Kayan.—Allied Laboratories, New York. Composition: Essentially phenolphthalein (about 1.2 grains per teaspoonful); a gum, sugar and starch. Fraudulently represented as a remedy for constipation, intestinal fermentation, toxemia, autointoxication, etc.—[N. J. 27139; August 1937.]

Kelament.—Lee Kelpodine Co., Inc., New York. Composition: Tablets consisting simply of kelp. Fraudulently represented as containing medicinal agents which, used as a food accessory, would be beneficial in mineral-salt deficiencies, soft and decayed teeth, pyorrhea, anemia, goiter, nervousness, insomnia, diabetes, frigidity, sterility, etc.—[N. J. 27127; August 1937.]

Kelpodine.—Lee Kelpodine Co., Inc., New York. Composition: Tablets consisting simply of kelp. For anemia, goiter, rickets, obesity, asthma, arthritis, dyspepsia, sterility, etc. Fraudulent therapeutic claims.—[N. J. 27129; August 1937.]

Kopp's.—C. Robert Kopp, Inc., Hellam and York, Pa. Composition: Morphine sulfate (¾ grain per fluidounce), flavoring oils including anise oil, with alcohol, sugar and water. Fraudulently represented as a safe and appropriate remedy for babies and infants, whereas it contained morphine, a poison.—[N. J. 27264; October 1937.]

Kroup Monla Cough Syrup.—W. D. Taylor & Co., Bessemer, Ala. Composition: Essentially sugar, water, ammonium chloride, glycerin, alcohol, chloroform (1.3 minims per fluidounce), menthol and extracts of plant materials including pine. Fraudulently represented as a safe and effective treatment for croup, whooping cough, etc.—[N. J. 27384; December 1937.]

Lawrence's Liniment.—Crain's Corner Drug Store, Longview, Texas. Composition: Essentially glycerin, carbolic acid, iodine, alcohol (2.8 per cent by volume) and chloroform (27 minims per fluidounce). Fraudulently represented as a cure for croup, soreness of lungs, etc.—[N. J. 27371; December 1937.]

Litsey's Vim Herb.—A. P. Durham, Anderson, S. C. Composition: Plant extractives and one or more emodin-hearing drugs. For stomach, kidney, liver and blood disorders, etc. Fraudulent therapeutic claims.—[N. J. 27149; August 1937.]

Menard's French Goup Suot.—Menard & Watson, Macon, Ga. Composition: Essentially creosote and volatile oils including camphor, incorporated in a fat. Fraudulent therapeutic claims.—[N. J. 27372; December 1937.]

Mentho-Korchlof.—Rieser Co., Inc., Shamokin, Pa. Composition: Essentially tissue paper, impregnated with menthol and other perfumes. Fraudulently represented as a remedy for sinus trouble, hay fever, etc.—[N. J. 27272; October 1937.]

Miller's Antiseptic Oil.—Herb Products Medicine Co., and Herb Juice Medicine Co., Jackson, Tenn. Composition: Essentially kerosene, with small amounts of red pepper and volatile oils including those of turpentine, wintergreen and sassafras. Fraudulently represented to contain no injurious substances and to be a remedy for muscular rheumatism, burns, scalds, diarrhea, cramps, etc.—[N. J. 27249; October 1937.]

Minnehaha Indian Herbs.—Spors Co., Le Center, Minn. Composition: Essentially plant material including senna leaves, gentian root, hawberry, triticum, and unidentified plant substances. Fraudulently represented to cure constipation and its results, such as rheumatism, kidney trouble, stomach disorders, etc.—[N. J. 27538; January 1938.]

Munyon's Tona Spat.—Munyon Remedy Co., Scranton, Pa., and Sunshine Co., New York. Composition: Essentially an iron and phosphorus compound, with a small amount of an arsenic compound, plus alcohol, water and flavoring material. Fraudulently labeled as a blood purifier and remedy for la grippe, anemia, insomnia, diabetes, etc.—[N. J. 27256; October 1937.]

Naco Nature's Aid.—Naco Co., Jackson, Miss. Composition: Essentially iron sulfate and water, with small amounts of aluminum, calcium, magnesium, manganese, sodium, potassium and phosphorus compounds. Not a germicide, as claimed. Fraudulently represented as a remedy for sores, burns, rheumatism, kidney pus, dysentery, etc.—[N. J. 27143; August 1937.]

Nash's Carbolle Salve.—Nash Bros. Drug Co., Jonesboro, Ark. Composition: Essentially petrolatum, with small amounts of carbolle acid, camphor, rosin and boric acid. For salt rheum, tetter, eczema, felons, etc. Not antiseptic, as represented. Fraudulent therapeutic claims.—[N. J. 27335; January 1938.]

Nash's Pain-Go.—Nash Bros. Drug Co., Jonesboro, Ark. Composition: Essentially kerosene, with small amounts of volatile oils such as turpentine and sassafras. Fraudulently represented as a "snake oil" and an "antiseptic."—[N. J. 27335; January 1938.]

Ourine Nasal Balm and Ourine Applention for the Ears.—Aurine Co., Chicago. Composition: "Nasal Balm," essentially mineral oil with small amounts of menthol, wintergreen, and green color; "Ourine Applention for the Ears," essentially glycerin, boric acid, extracts of plant drugs and volatile oils, including lavender. Fraudulently represented as remedies for nose and ear troubles.—[N. J. 27400; December 1937.]

Picot Compound Tablets.—Picot Laboratories, Inc., Wilmington, Del. Composition: Essentially sodium salicylate, sodium benzoate, potassium nitrate, magnesium carbonate, hawberry and oil of juniper. Fraudulently represented as a cure for rheumatism, an aid to stomach and kidneys, and a blood purifier.—[N. J. 27375; December 1937.]

Picot Grape Flavored Salt.—Picot Laboratories, Inc., Wilmington, Del. Composition: Essentially baking soda, cream of tartar and tartaric acid, with small amounts of sugar and saccharin. No grape-like taste or odor detected. Fraudulently represented as a remedy for rheumatism.—[N. J. 27375; December 1937.]

Ra-Ed-O Pilo Suppositories.—Helm Co., Benton Harbor, Mich. Composition: Essentially coco butter, with small amounts of quinine, salicylates, iron compounds and sulfates. "For all forms of piles—bleeding, itching and protruding . . ." Fraudulent therapeutic claims.—[N. J. 27275; October 1937.]

Radiumized Health Pad.—Radiumized Applicator Co., Inc. (address not given). Composition: 53 millimicrograms of radium per gram of ore, or 1,695 millimicrograms of radium per pad. Fraudulently represented to insure health and to cure kidney or bladder trouble, constipation, high blood pressure, goiter, skin diseases, etc.—[N. J. 27259; October 1937.]

Radiumized Water Revitalizer.—Radiumized Applicator Co., Inc. (address not given). Composition: Radium emanation (radon) in the proportion of 165 millimicrocuries of radon per U. S. quart. Fraudulently represented to "revitalize," to prevent illness, and to be a remedy and cure for chronic ailments, such as rheumatism, arthritis and gout.—[N. J. 27259; October 1937.]

R-P 60 Bladder and Gland Remedy.—Helm Co., Benton Harbor, Mich. Composition: Essentially water and extracts of plant drugs (including a laxative), with a small amount of salicylate. Misbranded because fraudulently represented for disorders of the kidney, bladder, rectum and spinal cord, among other things.—[N. J. 27275; October 1937.]

Rozel Douche Powder.—Rozel Laboratories, Chicago. Composition: Boric acid, common salt, ammonium alum, and small amounts of carbolic acid and menthol. Fraudulently represented as a cure for inflammations, irritations, leucorrhea, "feminine hygiene," etc.—[N. J. 27363; December 1937.]

Rozel Effervescent Cones.—Rozel Laboratories, Chicago. Composition: Essentially tartaric acid, baking soda, talc, starch and a small amount of a chlorine-liberating compound. Not a germicide for vaginal use, as represented. Fraudulent therapeutic claims.—[N. J. 27547; January 1938.]

Rx 333.—Eric Laboratories, Cleveland. Composition: Essentially aspirin and sodium salicylate. For the pains of rheumatism, neuralgia, gout, arthritis, lumbago, etc. Fraudulent therapeutic claims.—[N. J. 27374; December 1937.]

Rx 333 for Females.—Foundation Laboratories, Inc., Chicago. Composition: Essentially water, alcohol (34 per cent) and small amounts of phosphates, magnesium compounds, protein and perfume. Fraudulently labeled as effective for many female disorders, including certain types of sterility.—[N. J. 27385; December 1937.]

Rx 444 for Males.—Foundation Laboratories, Inc., Chicago. Composition: Water, alcohol (40 per cent) and small amounts of phosphates, magnesium compounds, protein and perfume. Fraudulently represented as a remedy for prostate and bladder troubles, backache, rheumatism, impotence, etc.—[N. J. 27385; December 1937.]

Sasa Scalp and Skin Aid.—Sasa Distributors, Portland, Ore. Composition: Essentially water and alcohol, with small amounts of borax, arsenic, caramel and oil of cinnamon. For dandruff, falling hair, eczema, etc. Fraudulent therapeutic claims.—[N. J. 27366; December 1937.]

Scheidemann Remedy Tea.—Scheidemann Remedy Co., Inc., Milwaukee. Composition: Essentially ground wood, twigs and needles, with juniper berries. Fraudulently represented as a remedy for diabetes, kidney disorders, etc.—[N. J. 27235; October 1937.]

Six-Ine Pills.—Kells Co., Inc., Newburgh, N. Y. Composition: Essentially an iron compound, quinine, strychnine, starch and chalk. Fraudulently represented as a remedy for nervous exhaustion and depression.—[N. J. 27532; January 1938.]

Stark's Headache Powders.—Stark's & Co., Midway, Ky., McKesson-Peter-Neat Co., Louisville, Ky., and Kells Co., Newburgh, N. Y. Composition: Essentially acetanilid (averaging 6.75 grains per powder), caffeine and baking soda. Fraudulent therapeutic claims.—[N. J. 27354; December 1937.]

Tabletas Marca Vida Para Los Ninos.—Mexican Medicine Co., Los Angeles. Composition: Essentially compounds of bismuth, calcium, sodium, potassium, carbonates, nitrates, starch, and extracts of plant drugs including emodin. Fraudulently represented as a cure for numerous disorders in infants.—[N. J. 27134; August 1937.]

Urtsepilin.—Gardner Laboratories, Chicago. Composition: Methenamine, water, glycerin, and extracts of plant material including corn silk, with small amounts of alcohol and salts of sodium, potassium and lithium. Fraudulently represented as a cure for Bright's disease, cystitis, rheumatism, gout, pneumonia, gonorrhea, etc.—[N. J. 27367; December 1937.]

Vegetrates.—Health Foundation of California, Los Angeles. Composition: "B. F. 1," essentially vegetable substances including rice bran, cinnamon, cranberry, kelp and leafy vegetables, as well as senna leaves and rhubarb; "B. F. 1" (in tablet form), also contained lime; "Formula H. F. C. No. A-45" (for arthritis), "D-44" (for diabetes), "A-417" (for hay fever and asthma), and "H-410" (for high blood pressure) were reported to consist essentially of unidentified root, stem and leaf material. All were declared misbranded because fraudulently represented to be "health builders" and to cure various disorders.—[N. J. 27263; October 1937.]

Vi-Go-Ra Olive Oil Hair Tonic.—Vi-Go-Ra Co., Providence, R. I. Composition: Essentially alcohol (about 77 per cent by volume), castor oil, a sulfonated oil, water and a coloring material. Misbranded because not more than a trace of olive oil was present, if any, and quantity or proportion of alcohol present was not declared on the label; misbranded, further, because of fraudulent claims that it would stop itching scalp instantly, check falling hair, and relieve eczema.—[N. J. 27399; December 1937.]

Vita-Mil.—Vita-Mil Co., Charleston, W. Va. Composition: Essentially epsom salt (about 20 per cent) and extracts of plant drugs, including a laxative, with small amounts of sodium benzoate, sugars, saccharin, caramel, flavoring material and water. Adulterated because not a herbal compound, as represented, but a mixture consisting largely of a mineral drug, epsom salt. For stomach and liver troubles, etc. Fraudulent therapeutic claims.—[N. J. 27380; December 1937.]

Wah-Poo-Sah Kee-Keo-Kee.—MacDonald Medicine Co., Detroit. Composition: Essentially water and alcohol, with small quantities of plant drugs, including a laxative. Fraudulently represented as "activating the muscle of the bowels" and as containing "no drugs of any kind."—[N. J. 27248; October 1937.]

Wil-Du Rheumatism and Gout Medicine.—Wil-Du Medicine Co., Woodbury, N. J. Composition: Essentially alcohol (67 per cent by volume), water, and extracts of plant drugs including senna. Fraudulent therapeutic claims.—[N. J. 27398; December 1937.]

World's Wonder System Builder.—World's Wonder Medicine Co., Inc., Detroit. Composition: Essentially epsom salt, extracts of plant drugs including a laxative, with sugar and water. Misbranded because represented to contain chiefly horehound, prickly ash, red clover, red puccoon, black root and pokeweed. Fraudulently represented as a cure for indigestion, scrofula, skin and blood diseases, kidney trouble, chronic rheumatism, etc.—[N. J. 27540; January 1938.]

Zonalife.—Zonalife Distributors, St. Louis. Composition: Essentially epsom salt and water, with small amounts of iron and sodium compounds, salicylic acid, wintergreen and saccharin. Fraudulently represented as a cure for headaches, sluggish kidneys, rheumatism and high blood pressure.—[N. J. 27245; October 1937.]

Correspondence

THE STATUS OF RETICULOGEN

To the Editor:—The communication from Dr. William P. Murphy, which appeared on page 169 of the January 14 issue of *THE JOURNAL*, in which he discussed the value of reticulogen, calls for a reply and word of explanation from the U. S. P. Anti-Anemia Preparations Advisory Board.

According to Dr. Murphy, Eli Lilly & Co. has stated in certain advertising literature that "Reticulogen contains 20 units of anti-pernicious anemia principle per cc." Eli Lilly & Co. have not, however, submitted Reticulogen for consideration by the U. S. P. Anti-Anemia Preparations Advisory Board. Consequently the board has made no statement of the potency of this product in terms of U. S. P. units. Moreover, on page 629 of the August 1938 issue of the *Journal of the American Pharmaceutical Association* the board stated that "it will not for the present assign to any preparations of injectable liver extract a strength greater than fifteen units per cubic centimeter." Finally, the U. S. P. advisory board has not published any standards for hemopoietic responses to which Eli Lilly & Co. could refer. Indeed, data concerning hemopoietic responses are only a part of the information which is considered by the board in the assignment of unitage to satisfactory products. Thus it should be entirely clear that the claim of Eli Lilly & Co. does not refer to U. S. P. units but can relate only to units of an entirely unofficial character.

The U. S. P. advisory board is the only agency for assigning U. S. P. units to liver and stomach preparations. Therefore, if any manufacturer labels a product in terms of units other than U. S. P. units, they are units devised merely by that manufacturing house and must not be identified with U. S. P. units. It is most regrettable that the use of such unofficial units should exist and thus lead to confusion. If one manufacturer determines his own units, so may all, and thus the work of the advisory board in securing uniformity of labeling would go for naught.

The board, therefore, took the matter up with the manufacturers of Reticulogen, pointing out the difficult situation which had arisen, and asked them whether they would not change their labels and advertising literature by withdrawing the term "unit" and in this way help to clarify the situation. It is pleasant to report that Mr. Eli Lilly, president of Eli Lilly & Co., has informed the board that in the future on its labels and in its advertising literature it will describe the potency of its product in another way than by the term "unit."

A final word of explanation concerning the definition of a U. S. P. unit should be made. It will be recalled that the first publication of this board, made Feb. 14, 1938, defined the term "U. S. P. unit" as "that amount of material which, when given daily to patients with pernicious anemia, has produced a satisfactory hematopoietic response." It is perhaps desirable to point out that such a definition of a U. S. P. unit does not imply that it represents the minimal amount of effective material which might result in a satisfactory response but merely that particular amount of material which has in fact produced such a response.

Thus if a manufacturer submits at a later time data indicating that a smaller amount of material than that originally tested will give a response satisfactory to the board, a greater unitage for a given amount of the same preparation will be officially assigned. It should therefore be understood that U. S. P. units are not necessarily interchangeable from one product to another. Nevertheless, from the point of view of the patient and the physician it is of far greater practical importance that the official U. S. P. unit should indicate that amount of material which will assuredly possess the potency just defined.

UNITED STATES PHARMACOPEIAL ANTI-ANEMIA
PREPARATIONS ADVISORY BOARD.
By C. W. EDMUNDS, Chairman.

MAGNESIUM SULFATE IN PAROXYSMAL TACHYCARDIA

To the Editor:—In *THE JOURNAL*, Dec. 17, 1938, page 2275, is a discussion by William Dressler on the use of magnesium sulfate in paroxysmal tachycardia. In *Klinische Wochenschrift* (14:1429 [Oct. 5] 1935) was reprinted my research: *Ueber die Magnesiumwirkung auf das Herz* (The Influence of Magnesium Sulfate on the Heart). This paper was abstracted in *THE JOURNAL*, Nov. 23, 1935, page 1727. I was the first to report the use of magnesium sulfate in paroxysmal tachycardias and ventricular fibrillation. About the same time was published an experimental study on the effect of magnesium on tachycardia produced by barium and strophanthin (Rothberger, C. J., and Zwillinger, L.: *Ueber die Wirkung von Magnesium auf die Strophantin- und die Barium-tachycardie*, *Ach. f. exper. Path. u. Pharmacol.* 181:301, 1936). Dr. Dressler learned this use of magnesium sulfate from me in Vienna. Therefore I was astonished to read that he did not name me as the author of this work.

L. ZWILLINGER, M.D., Prostějov, Czechoslovakia.

CERTIFICATION OF STAINING SOLUTIONS

To the Editor:—In a recent note in *THE JOURNAL* (Sept. 24, 1938, p. 1239), attention was called to the work that is being done by the Commission on Standardization of Biological Stains, and the question was raised as to whether it would not be possible for this organization to be of more assistance to physicians if its duties were broadened so as to include the approval of satisfactory staining solutions as well as stains in the solid form. In this earlier note the difficulties of doing this were discussed, and the article ended with a query as to who are the chief purchasers of stains in solution form and as to which particular staining solutions give the most trouble at present.

Considerable comment concerning this article has been received, and it is felt that, to a certain extent, the questions asked have been answered. It has been concluded from the comments received that physicians are, as was suspected, the chief purchasers of staining solutions. It also appears that the biggest demand is for the blood stains and that solutions of this type apparently give the most trouble if purchased from an unreliable source. The physician or technician who has to make a blood stain himself but is not equipped to make up the necessary solution or for some other reason finds it inconvenient to do so usually cannot take time to write to some supply house in a distant city in order to obtain the solution already prepared. There is no question but that it would be of assistance to such a physician if some local dispensary of known reliability was available to him from which he could purchase the staining solution he needed.

Since publication of the previous article, the commission has had its attention called to a group of technicians here, a private laboratory there and some individual somewhere else who are disinterestedly trying to supply local physicians in a semi-commercial way with reliable staining solutions. It is felt that there must be other organizations, such as clinical laboratories, or persons endeavoring to do the same sort of thing in other places. Undoubtedly the Stain Commission could be of assistance to any one who is sincerely trying to do this. It could help by seeing that the best ingredients, proper formulas and approved methods of preparation are employed, by arranging to test the products without prohibitive expense to those who prepare the solutions and finally by adopting some plan to assure the purchaser of the reliability of the stains thus prepared.

This note is published in the hope that any persons or organizations who are trying to supply superior staining solutions to physicians and who would welcome the cooperation

of the Stain Commission will get in touch with the chairman at the address given. It is felt that some practical plan can be worked out; but before putting any such plan into operation, we must have a little clearer idea than at present how widespread will be the cooperation we can have in the project. Physicians reading this article can be of assistance in calling it to the attention of some one in their locality who they think might be fitted to cooperate with them and with us in such an undertaking.

H. J. CONN, PH.D., Geneva, N. Y.

Chairman, Biological Stain Commission.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

CRITERIA OF CURE IN NEUROSYPHILIS

To the Editor:—What tests and observations are of the greatest importance in the examination of the spinal fluid to determine whether a cure of syphilis has been effected? What tests in a neurologic examination are most important in determining whether a patient has been cured?

M.D., Kentucky.

ANSWER.—This question cannot be answered without a brief discussion of the criteria of "cure" in syphilis. The word "cure" may be applied in three different senses: (a) biologic, (b) serologic and (c) symptomatic. Biologic cure implies that the last remaining spirochete has been eradicated from the patient's body, that he is rendered susceptible to reinfection with syphilis and usually that he is simultaneously "cured" from serologic and symptomatic standpoints. So far as is now known, biologic "cure" is attainable only when treatment is begun in the early stages of syphilitic infection, probably within the first six months. It cannot, so far as is known, be accomplished in patients with late syphilis.

Serologic "cure" implies that all serologic reactions of the blood and spinal fluid are rendered negative and remain so. This type of "cure" is not necessarily synonymous with biologic cure, since serologic "cure" is attainable in some instances of late as well as of early syphilis; nor is it synonymous with symptomatic "cure," since clinical progression or relapse may take place in the face of persistently negative serologic reactions.

Symptomatic "cure" implies that the patient is relieved of symptoms or lesions caused by syphilis, that he is restored to normal health, is maintained in normal health for the duration of his lifetime and is rendered noninfectious for others. Symptomatic "cure" is synonymous with neither biologic nor serologic "cure," since symptomatic "cure" may be attained both in early and in late syphilis without complete eradication of the infection and with positive serologic reactions of the blood or spinal fluid, or both, persisting. For example, symptomatic "cure" is even attainable in dementia paralytica, though in such patients both foci of organisms, positive serologic reactions of the blood and spinal fluid and neurologic abnormalities may persist.

Strictly speaking, therefore, neither the examination of the spinal fluid nor a neurologic examination can be used as a definite criterion of "cure" of syphilis, either biologic, serologic or symptomatic. It is, however, true that in early syphilis examination of the spinal fluid should be employed as a routine as (a) a determinant of the type and amount of desirable treatment and (b) a criterion for the complete cessation of treatment. For the former purpose, examination of the spinal fluid should be performed as a routine at about the sixth month after the institution of treatment. If at this time the spinal fluid is normal, treatment may proceed by standardized routine methods. If, on the other hand, the spinal fluid is abnormal, alterations in the treatment system are frequently necessary to provide for the contingency of asymptomatic neurosyphilis. For the latter purpose, i. e. as a determinant of "cure," examination of the spinal fluid should be repeated in all patients with early syphilis at the end of a post-treatment year of probation and regardless of whether the original spinal fluid was normal or abnormal. If at the time of this last examination of the spinal fluid abnormalities are found, treatment should be resumed.

In late syphilis, i. e. of more than two years' duration, a whether or not the patient has symptoms or physical signs pointing to involvement of the nervous system, the spinal fluid should be examined before any treatment is given or as early as possible in its course. If the original examination of the spinal fluid of a patient with late syphilis is negative it need not be repeated, since in persons in whom immunity has been established a normal spinal fluid is a practical guaranty against subsequent development of syphilis of the central nervous system. If, however, in late syphilis the spinal fluid is abnormal at the original examination, reexamination of the fluid during and after treatment is essential in order to estimate the effectiveness of treatment, to provide for alterations in its type if necessary and to gauge the optimal amount of treatment desirable.

The tests obligatory in the examination of spinal fluid at the stage of syphilitic infection are (n) cell count, which must be performed within one hour after the fluid has been withdrawn, (b) protein estimation, preferably by a quantitative technic, (c) Wassermann test on graduated amounts of fluid ranging from 0.1 to 1 cc. (flocculation tests on spinal fluid are less satisfactory than complement fixation tests) and (d) a colloidal gold, mast or benzoin test.

Like examination of the spinal fluid, results of a neurologic examination, whether negative or positive, can be used as a criterion of "cure" in syphilis only in the light of the discussion of "cure" briefly given. In patients with early syphilis it may be taken for granted that at the start of treatment neurologic abnormalities are absent (excepting the rare instance of acute syphilitic meningitis or the contraction of syphilitic infection by a patient with some other neurologic disease). If the patient with early syphilis is normal from the neurologic standpoint, he should remain so not only during the period of treatment and the post-treatment year of observation but also during yearly periodic recheck examinations for the duration of his life.

In patients with late syphilis, however, and even in those who have neurologic abnormalities present at the start of treatment symptomatic cure may often be attained. In this case the important feature of recheck examinations from the neurologic standpoint is not the disappearance of abnormalities which were originally present but instead the absence of progression in these abnormalities or the nondevelopment of fresh ones.

It is impossible in the brief confines of such a reply as this to outline the steps of complete neurologic examination. Assuming the absence of gross neurologic abnormalities, however, the most important features of recheck examination of treated syphilitic patients are the state of the pupillary reactions both to light and in accommodation; examination of the optic fundus as to the appearance of the optic disks and also a test of visual acuity and at least gross tests of the visual fields; the presence or absence of conduction deafness; tests of the deep and superficial reflexes, especially knee and ankle jerks; tests of deep pain sense by squeezing the Achilles tendon and the gonads; tests for vibratory sense in the lower extremities, particularly over the malleoli and tibias; tests for ataxia, including not only such gross tests as the Romberg, the knee-heel, the finger-nose and the finger-finger, but also more delicate tests such as position sense in the great toes, and sensory examination for abnormalities of light touch and pain, particularly in zonelike distribution over the thorax or in patchy distribution over the fronts of the shins.

DIAPER RASH

To the Editor:—Would you please outline a proper course of dietary and local management for a severe case of ammoniacal dermatitis.

M.D., Wisconsin.

ANSWER.—Ammoniacal dermatitis is an erythematous dermatitis occurring in the napkin area of infants. It is an intertrigo caused by friction of the diaper or by uncleanness. Ammonia is formed in the wet diaper in situ by the growth of a saprophytic bacillus which splits the urinary urea into ammonia. This bacillus, according to Cooke (The Etiology and Treatment of Ammonia Dermatitis of the Gluteal Region of Infants, *Am. J. Dis. Child.* 22:480 [Nov.] 1921), is derived from the intestinal contents and infests the diaper as a result of soiling by feces. The best treatment is prophylactic. The diaper should be washed with scrupulous cleanliness, rinsed thoroughly several times in clear water and then put through a final rinsing of boric acid solution. The use of soap and water on the affected parts should be avoided and the skin cleansed with olive oil or liquid petrolatum. A soothing lotion such as zinc oxide 12 Gm., talcum 8 Gm., glycerin 6 cc., sodium borate 6 Gm. and solution of calcium hydroxide to make 240 cc. may be used, or the following ointment: purified tar 3 Gm., zinc oxide 8 Gm., starch 8 Gm. and simple ointment to make 30 Gm.

DOG BITES AND RABIES

To the Editor:—In connection with the prevention of human rabies, would you kindly discuss the following questions: Is it a fact that the patient's skin wound must be of subcutaneous depth before the Pasteur treatment is indicated (assuming that cauterization has previously been performed)? If no bite has been incurred but the skin has been in contact with the saliva of a rabid animal, is treatment indicated? Do the presence of small superficial breaks in the skin, such as scratches, partially healed cuts and pimples indicate treatment if the patient has had contact with a rabid animal?

JOHN M. COLLINS, M.D., Seattle.

ANSWER.—There are many thoughtful persons who deplore the cauterization treatment of dog bites or any other open wounds. They believe that such methods are only a repetition of the hot oil treatment of wounds, which was considered proper treatment in the days of Ambroise Paré but which thinking persons have abandoned just as did Paré.

Some believe that if the patient is seen immediately after a wound or bite has been sustained the most effective method of treatment is careful, patient and prolonged cleansing of the wound with soap and water and subsequent irrigation of the wound with warm salt solution. The depth of the wound would have no influence in modifying this treatment except that an irregular wound should be opened or enlarged sufficiently to make sure that every portion of it is reached by the soap and water and salt solution. When the wound resulting from a bite is treated immediately and carefully in this fashion the administration of antirabies serum is not advocated in all instances. On the other hand, if the wound is not seen promptly after the injury has been sustained and so there has been opportunity for the virus to enter the deeper tissues, it should still be cleansed as carefully and thoroughly as possible and this cleansing should be followed with the Pasteur treatment.

ISOLATION OF TUBERCULOUS PATIENTS IN
GENERAL HOSPITALS

To the Editor:—The county medical society requested a tuberculosis survey. This survey was recently published and under Institutional Care is found the statement: "The county needs additional beds for the tuberculous. The attitude of the local hospitals is commendable in admitting and caring for the tuberculous for limited periods of time, but the necessary prolonged period of bed rest is not possible and thus far in these hospitals the isolation of the tuberculous has not been accomplished." The last clause has caused considerable discussion, so I am coming to you for an answer to the following question: What precautionary measures should be employed when tuberculous patients are confined to a general ward in a hospital?

EXECUTIVE SECRETARY, COUNTY SOCIETY.

ANSWER.—There is excellent support for opening a general hospital to tuberculous patients. As early as 1895 Dr. Lawrence Flick of Philadelphia made a provision for such use of general hospitals. In 1908 the International Congress on Tuberculosis urged general hospitals to provide beds for the tuberculous. In 1912 and 1924 the National Tuberculosis Association adopted resolutions in favor of using general hospitals for tuberculous patients. In 1920 and 1921 the American Medical Association and the American Hospital Association adopted such resolutions. Probably the most recent action on this subject was by the National Tuberculosis Association and the American Hospital Association. In June 1938 a committee of the National Tuberculosis Association with Dr. Charles Hatfield of Philadelphia as chairman made a report strongly recommending the use of general hospitals for the tuberculous. The manuscript for a bulletin on this subject has recently been prepared by Dr. W. H. Oatway of the University of Wisconsin for the American Hospital Association. This is the most complete presentation of the subject that has been made to date. It not only gives the reasons for the use of general hospitals for the tuberculous but also presents a procedure which should be carried out in every hospital that admits tuberculous patients.

Already a good many general hospitals in this country have established tuberculosis services. In fact in 1935 the American Medical Association presented the report of an extensive survey which showed that 418 hospitals in the United States have tuberculosis services and that in a single year approximately 37,000 patients were admitted to them.

The modern treatment of tuberculosis is such that removing patients to isolated places is no longer necessary. Any general hospital that is adequately equipped or can be so equipped is satisfactory for the treatment of this disease, provided nurses and physicians well informed and qualified in the treatment of this disease are in charge. In other words, a division of the hospital can be operated with the same effectiveness in the treatment of tuberculosis as a sanatorium.

The contagiousness of tuberculosis was clearly recognized and discussed nearly 2,500 years ago. The experimental work of Villemin, Colnheim, Koch and the epidemiologic studies of Budd and others proved beyond doubt that tuberculosis is contagious. This fact probably accounts for the statement in the report of the survey in question to the effect that the isolation of the tuberculous has not been accomplished. Recently careful observations have proved beyond doubt that tuberculous patients in hospitals and sanatoriums transmit tubercle bacilli to members of the personnel. Moreover, there is no reason to doubt that they transmit bacilli to other patients. In seeking appropriations for the building of sanatoriums in this country, one of the main arguments was and still is that the tuberculous patient who has the disease in the contagious stage should be removed from his home in order to prevent the spread of tubercle bacilli to the members of his family and other associates. It is ridiculous to consider that a disease which is contagious while the patient remains in the home is not equally contagious when the patient is transferred to a hospital.

The control of tuberculosis in many parts of the world has been so effectively conducted that at present more first infections occur in adult life than in the earlier years of life. For example, Heimbeck of Oslo found that approximately 50 per cent of the students of nursing reacted to the tuberculin test on entrance but that on graduation, after having taken a tuberculosis service, 100 per cent reacted to the test. In this country Geer found that 30 per cent of the entering students under his observation reacted to tuberculin, while 100 per cent of the same group reacted on graduation. These students were subjected to exposure to tuberculosis in a special service for this disease in a general hospital. Boynton found that the rate of tuberculosis infection is a hundred times greater among student nurses in a general hospital service than among students in a college of education and 500 times greater among student nurses in a special tuberculosis service than among students in a college of education. Moreover, when students of nursing and medicine become infected with tubercle bacilli, in a considerable number pulmonary lesions develop demonstrable by x-ray examination; in some clinical tuberculosis, such as pleurisy with effusion, develops, and a few die soon of acute forms of the disease, such as pneumonia, meningitis and miliary tuberculosis. Ross of Manitoba has reported 135 students or graduates in nursing who have been treated in his institution. He says: "Scores of students of nursing lose health and life through hospital-contracted tuberculous infections. Practically all students become tuberculin-positive during their course, showing that they have become infected even if disease should not follow. The hospital cannot avoid responsibility for the infection of nurses until the utmost of medical and nursing science has been used to prevent it."

In Saskatchewan Ferguson found that twelve times as many students or recent graduates in nursing fall ill with tuberculosis as other persons in the general population and eight times as many as among normal school students of about the same age as the nurses.

Heimbeck of Oslo has reported the highest percentage of student nurses falling ill with tuberculosis during training in a general hospital with a tuberculosis service.

Myers, Diehl, Boynton and others have recently called attention to the fact that in 9.6 per cent of medical students who took a tuberculosis service and became infected, so as to react to the tuberculin test, lesions developed in the lungs which could be demonstrated by x-ray films or which caused illness during the brief period of their observations. Among students of nursing who took a tuberculosis service and became reactors to tuberculin, such lesions developed in approximately 11 per cent. In addition to those in whom demonstrable lesions developed within a few months or a few years, all others who became infected have primary tuberculous complexes in their bodies and therefore are potential tuberculosis patients.

With this evidence and much more that might be cited, the time has arrived when one can no longer afford to treat tuberculous patients in general hospitals without making adequate provision for the protection of the personnel. In addition to the responsibility that every hospital should assume for the health of its personnel, there is a legal aspect which is looming large in this country and has become a serious reality. In several states tuberculosis has been placed on the occupational disease list and in others such action is being contemplated. Awards have been drawn by industrial commissions for a good many members of hospital personnel during the past few years.

In the earlier resolutions adopted by various organizations with reference to general hospitals admitting tuberculous patients, the danger to the personnel was minimized or ignored. How-

ever, the recent evidence of the spread of tuberculosis to members of hospital personnel has been so overwhelming that a definite account was taken of the dangers in the 1938 report of the Committee of the National Tuberculosis Association and the recent *Bulletin of the American Hospital Association*.

BACKACHE, MERALGIA PARAESTHETICA AND POSSIBLE SYMPATHETIC NERVOUS SYSTEM TRAUMA

To the Editor:—A married white woman aged 27 first experienced an attack of low back pain, acute and cramping in nature with radiation down the right thigh, at 19. She attributes the attack to lifting. It subsided in a few days with bed rest and local heat. The only previous trauma she can recall was a fall from a tree at the age of 14, the fall not being followed by disability. At the time of the first attack two orthopedists recommended spine fusion for tropism of the articular facets of the fifth lumbar vertebra. The operation was not performed. Following this attack and for the next six years she experienced similar attacks recurring at intervals of roughly three months. Precipitating factors were unusual strain as in lifting, golf or tennis, although at other times she could perform these acts with impunity. The duration of the attacks varied from a few days to two weeks, usually responding to time, bed rest and local heat. When conservative measures failed she submitted to osteopathic maneuvers, which seemed to give relief. She found it advisable to sleep with a 1 inch plank under the mattress. The last attack began in January 1937. While sitting in a theater her back suddenly began to hurt and on attempting to arise she found that pain prevented her from straightening. The low back area seemed cramped into a knot and all trunk and thigh movements were painful. At this time there was no sciatic radiation. Passive flexion of the thighs and pelvic rocking resulted in pain in the low back area and this area was tender to deep pressure. Her most comfortable position was lying with the legs flexed on the thighs and the thighs flexed on the trunk. Conservative measures were tried for four weeks but were unsuccessful and the patient was then hospitalized. Physical and neurologic examinations were negative except as noted and absent ankle jerks. Gynecologic examination was negative. The blood count was normal, urinalysis negative, blood Wassermann reaction negative, blood sugar 95 mg. per hundred cubic centimeters, nonprotein nitrogen 25 and cholesterol 150. Spinal fluid pressure was 70 mm. of water, protein not elevated, gold curve flat, cells 5, Wassermann reaction negative. Reversed Queckenstedt showed that no block was present. X-ray examination showed faulty articulation of the articular facets of the fifth lumbar vertebra with the sacrum. The low back pain subsided after two days on a Bradford frame although straight leg raising still caused pain in the low back area. A modified Albee spine fusion was then done, the graft being taken from the left iliac crest, splintered and laid in the bed. The wounds healed by first intention. During the postoperative period she did not complain of pain in the operative site as much as pain in the anterolateral aspect of the right thigh in an area about 2 inches below Poupert's ligament nearly to the knee. This pain was burning, sticking, tearing and digging in nature. It was quite constant although worse at night. On neurologic examination this painful area was found to correspond to the distribution of the lateral femoral cutaneous nerve. The area was hyperesthetic and firm touch was painful. The patient described it as the kind of pain produced by pressing on a carbuncle. Even light pressure, as from clothes, could not be tolerated long. Paresthesias were present in this area. Outside this area there were no neurologic changes except for the absence of ankle jerks bilaterally. Muscle tone and strength were equal and normal. A diagnosis of meralgia paraesthetica was made and in September 1937, the right lateral femoral cutaneous nerve was interrupted at its exit from the fascia, a piece excised and the proximal stump injected with absolute alcohol. For the next four days there was nearly complete relief except for occasional shooting pains similar to those experienced before the operation. Histologically the excised nerve showed "degenerative changes." Five days after the operation the entire picture recurred with pain as constant and severe as before. Two subsequent operations were performed peripherally. In October 1937 the nerve was interrupted in the right iliac fossa with no effect on the pain. In January 1938 the stump of nerve left at the first operation was found tightly bound down as it passed through Poupert's ligament. The end was bulbous. It was freed and cut back as far as possible with no effect on the pain. I might add that the first and third nerve operations were done only after procaine blocking had shown that they should be successful. During this entire period the patient had been experiencing constant pain in the low back area and stereoscopic roentgenograms showed that fusion was not complete. In March 1938 studies with iodized oil showed no block. Alcohol injections into the lumbar dorsal roots were attempted but the nerves could not be reached because of the presence of the fusion. Epidural injections gave no relief. In May 1938 typhoid vaccine fever therapy resulted in exacerbation of the pain. The patient was taking 3 grains (0.2 Gm.) of codeine and 2 grains (0.13 Gm.) of morphine daily without marked effect. She was going downhill physically. In July 1938 spinal anesthesia stopped the pain for its duration. Laminectomy over the lumbar roots was performed and the nerves were found to be normal except for a few arachnoidal adhesions, which were cleared. The patient experienced moderate relief for about one week. In August 1938 a high thoracic chordotomy was performed. Since then the patient has had no pain in the right thigh or the low back area. About one week after the operation, however, she began to experience constant burning pain in the palm of the right hand. The pain was digging, tearing and crushing in nature. Exposure to cold air made the hand cyanotic; exposure to warm air caused it to become red and swollen. All movements are painful, although they could be performed. The area is hyperesthetic. The only relief that can be obtained is by immersion in cool, not cold water. The skin is macerated. There is no vesiculation or ulceration and the nails appear normal. The dorsum of the hand is not affected. Application of a tourniquet to obstruct the venous return increases the pain. Obstruction

of the arterial supply does not increase the pain but it does not relieve it. The patient readily agreed that she could not continue to take narcotics and although she experienced the usual withdrawal symptoms she stopped immediately without having to taper off. Barbiturates at night are her sole medication. Thiamin chloride, 3,000 units daily, is being given. Incidentally there are no neuropsychiatric determinants in this case and a psychiatric diagnosis is untenable. If this is causalgia could it have been caused by traumatism to the nerve roots at the time of the chordotomy? From the literature I have the impression that this condition is produced only by lesions more peripherally. If the damage is to the nerve roots would alcohol injections into these dorsal roots be more rational than stelletomy? Is stelletomy or destruction of the stellate ganglion by alcohol always followed by a Horner's syndrome and if this syndrome intervenes is there any possibility of its being severe enough to impair vision? What would be the order of investigation and procedure which would be least likely to injure or mutilate this patient without unduly prolonging her pain? Is periarthral sympathectomy as described by Leriche still being used? If this is not causalgia would you give the differential diagnosis and outline of therapy?

M.D., New York.

ANSWER.—The detailed history, with extensive and apparently accurate clinical and laboratory studies, leaves little that can be recommended from the standpoint of further examination.

The initial complaint of low back pain with sciatic nerve radiation following a strain from lifting, and with subsequent attacks which were often precipitated by lifting, golf or tennis, could best be explained on a mechanical basis, such as retropulsion of an intervertebral disk, without actual rupture of the posterior fibers of the annulus fibrosus. Symptoms may be relieved under these circumstances when the muscle spasm resulting from impingement of the bulging disk on a nerve root is relieved, permitting the fibrocartilaginous disk to reassume its normal contour. It now seems probable that in a considerable proportion of the cases in which there is intermittent backache with sciatic pain the pathologic condition is that which has been described. The presence of a few arachnoidal adhesions about the lumbar nerve roots may be explained as secondary to this intermittent mechanical irritation.

It is more difficult to explain the subsequent symptoms and signs of lateral femoral cutaneous nerve irritation and the painful manifestations in the right upper extremity. The onset of the so-called meralgia paraesthetica within a few days after an operation which was predicated to cure the low back pain and the occurrence of acute pain and vasomotor phenomena in the right hand following the thoracic chordotomy, which apparently resulted in relief of pain in the areas of which the patient had previously complained, does definitely suggest neuropsychiatric factors in spite of the fact that they are so definitely denied. Addiction to morphine must be considered as a possible motive for influencing the mind in the development of a series of painful symptoms which might entitle the patient to receive a drug which her system may have demanded. The possibility that she may be obtaining morphine although it is no longer administered to her by those in attendance cannot be ignored without exhaustive attempts to determine this fact.

If there has been no mistake in interpreting the symptoms and signs which have been supplied, the painful phenomena of the right hand can be explained as a result of traumatism to the sympathetic nervous system. The symptoms described may be those of an atypical erythromelalgia or Raynaud's disease. Attacks of similar painful phenomena have been observed following surgical sections of sympathetic nerve trunks and have been attributed to the development of small neuromas at the cut end of the sympathetic nerve fibers. The chordotomy must have involved some of the tracts of the sympathetic nervous system in the upper thoracic spinal cord, and contraction of scar tissue about sympathetic nerve fibers may be responsible for the symptoms.

Any treatment which can be recommended would be largely hypothetical. Excision of the stellate ganglion has frequently resulted in relief from symptoms such as those described. Accurate selection and removal of this ganglion is followed by the development of some degree of enophthalmos, narrowing of the palpebral fissure and contraction of the pupil of the eye on the operated side. This Horner's syndrome is not sufficient contraindication to the operation if removal of the ganglion offers a reasonable prognosis for symptomatic relief. If the patient is willing to permit the isolation of the stellate ganglion with local anesthesia, a therapeutic test should be carried out before undertaking its excision. After the ganglion has been injected with procaine hydrochloride, the hand may be exposed to cold air or water and subsequently to heat to determine whether or not the procaine block has prevented the recurrence of pain and of the vasomotor phenomena. In the event that such an injection does relieve these symptoms, it would appear logical to proceed to remove the ganglion. Periarthral sympathectomy as described by Leriche has for the most part been discontinued as a therapeutic measure.

CHILDBIRTH AFTER THIRTY—INFANTILE UTERUS—
FEAR OF PREGNANCY

To the Editor:—1. What is the present tendency in scientific thought relative to the prognosis of pregnancy in a physically healthy woman after the age of 30 years? I have felt that such a woman with normal measurements and satisfactory obstetric care would have only slightly if any less chance of giving birth to a normal, healthy child than a woman younger. There seems to be a tendency, however, to discourage pregnancy after the age of 30 or 35 unless the conditions are absolutely ideal. Some of the childless marriages appear to be explained adequately in the minds of laymen by the diagnosis of "sterility" without tangible evidence of the condition. 2. Would a physician's diagnosis of "infantile uterus" without other evidence of pelvic disorder be a possible indication for endocrine therapy? 3. Should a woman who appears to have no other contraindication to pregnancy in her thirties except for fear of labor be allowed to adopt a child? Would it not be better to give endocrine treatment where indicated as well as help for unsatisfactory attitudes with the hope that such a woman can have her own child? On the other hand, should a woman who has such a fear of pregnancy and who is so far removed from satisfactory obstetric care that her condition in labor might be hazardous be allowed to rationalize her supposed biologic deficiency?

M.D., Nebraska.

ANSWER.—1. A physically healthy woman, after the age of 30 years, if her husband is potent, can have as many babies as she desires and her chances of giving birth to normal healthy offspring are just as good as in a younger woman. Women after 40 have had healthy children with relatively simple labors, although it must be said that complications are a little more common after this age. Such complications, however, are amenable to modern obstetric treatment and fear of them should not restrain women from bearing children.

2. The treatment of infantile uterus, at the present time, is unsatisfactory with and without endocrines. Conflicting reports are on record regarding the results in the use of estrogen with or without progesterin or gonadotropic substance. Recently there has been reported some success in increasing the blood supply of the ovaries by making omental grafts on them, thus establishing a collateral circulation. The better blood supply, it is said, developed the uterus.

3. In the first place, proper education of a woman who has tocophobia will almost always succeed in removing groundless fears. Modern obstetrics has made so much progress that no woman should fear having a baby. In the second place, the adoption of a child is a mutual benefit. Both the mother and the child receive the greatest possible good, and it is probable in this case that the presence of one child may remove the unnatural apprehension of the mother. Distance from available obstetric service should not form any part in the discussion of the indications for obstetrics. Good roads, the automobile and the generosity of the profession serve to handle the situation satisfactorily.

SYPHILIS AND PULMONARY TUBERCULOSIS

To the Editor:—What is the current opinion on the treatment of syphilis complicating pulmonary tuberculosis? Are there any comprehensive articles on the subject?

M.D., Virginia.

ANSWER.—A recent report by Smith (*Am. J. Syph., Gonorr. & Ven. Dis.* 22:72-81 [Jan.] 1938) as well as one by Padgett and Moore (*Am. Rev. Tuberc.* 33:10 [Jan.] 1936) should be consulted.

In the past there has been a tendency to be conservative in treating syphilis in a tuberculous subject. Apparently this point of view is changing. Some investigators think that carefully controlled treatment of syphilis is even beneficial to a concomitant tuberculosis. Smith found that progressive tuberculosis is not more frequent in the treated syphilitic patient than in similar groups of nonsyphilitic tuberculous patients. The treatment of syphilis seems to lessen the frequency of progressive tuberculosis. Padgett and Moore feel that the question is not entirely settled. It probably is well to use extreme care in treating a syphilitic patient with concomitant tuberculosis. Any remedy likely to set up reactions would be contraindicated. Either neoarsphenamine or maphersen would be preferred for the arsenical. A bismuth salt causing little physical inconvenience is preferable, provided at the same time it furnishes an adequate antisiphilitic effect with little or no deleterious effects. For a hospitalized patient such a preparation would be an aqueous solution of sodium bismuth tartrate 2 cc. administered intramuscularly in the buttocks three times a week. For the ambulatory patient a weekly injection of a 10 per cent suspension in oil of bismuth subsalicylate is indicated. Neither preparation causes inconvenience, and each employed over a period of ten weeks would give an adequate bismuth effect for a course. The arsenicals in moderate sized doses could likewise be used in weekly injections for a term of ten weeks if no untoward contingencies arise.

Probably three or four such alternating courses of the arsenicals and of the bismuth could be safely used, employing continuous treatment. Iodides are contraindicated in tuberculosis because of a possible danger of absorption of protective connective tissue walls formed around tuberculous foci.

SALINIZING AND CHLORINATING SWIMMING POOL

To the Editor:—What is the feasibility of salinizing an outdoor swimming pool to make the water isotonic or slightly hypertonic? The pool has a standard chlorinating filtration plant. Will you let me know if the water could be salinized without interfering with the chlorinization, and if so about what concentration of salt would be advisable?

AIDAN M. MULLETT, M.D., Colorado Springs, Colo.

ANSWER.—It is feasible, but fairly expensive, to salinize fresh swimming pool water. Normal sea water contains about 3 per cent of sodium chloride in solution or about 12½ tons per hundred thousand gallons. It is probable that a smaller amount would be more desirable in a swimming pool, depending of course on the clientele served.

Normal sea water can be effectively chlorinated for disinfection by the same methods used for fresh water, assuming that reasonably accurate chlorine control equipment is used and that proper tests are made for residual chlorine in the water to permit the operator to govern the rate of application of the chlorine. Another method of disinfecting sea water is by electrolysis.

PROBABLE PSYCHOGENIC SYNDROME

To the Editor:—A white man aged 25, an engineering student, weight 165 pounds (75 Kg.), height 5 feet 9 inches (175 cm.), complains of frontal headache, a sensation of pressure above the hard palate, fatigue and occasional nervousness. The headache has been present continuously for the past four years (it began in the second year of college), interfering tremendously with his ability to concentrate and making him so uncomfortable at times that he has little desire to see any one, although he is quite a good mixer and extremely cheerful ordinarily. There has never been any loss of weight, and the patient eats and sleeps well. During his schooling he had been troubled with financial worries but is now over this. He does not smoke or drink. The past history reveals an appendectomy ten years ago and a tonsillectomy two years ago. The personal history shows a tendency to worry, but there is no occasion for it at present. He does not take part in any physical activities at present. Physical examination revealed septal deviation of the nose causing a slight breathing obstruction. The lung fields were clear; the heart showed no abnormalities; the blood pressure was 135 systolic, 85 diastolic; the abdomen was normal. Neurologic examination revealed nothing of significance. The erythrocytes numbered 5,100,000 and leukocytes 8,500 with a normal differential count. The content of hemoglobin was 90 per cent. The urine was negative for albumin and sugar. The basal metabolic rate in three tests was -13.0, -11.5 and -12.0. The Wassermann reaction of the blood was negative. He has been on one-half grain (0.03 Gm.) desiccated thyroid three times a day for the past two months without any demonstrable change in his condition. Kindly make recommendations as to future therapy.

M.D., Pennsylvania.

ANSWER.—None of the symptoms described, singly or in combination, may be considered as due to any specific etiology. In fact, in many such cases there is a multiple etiology. As a whole, the case strongly suggests that the major etiologic agent is psychogenic. Because of its nonspecific nature and the suspicion of a psychic disturbance, the immediate approach is one aimed at exclusion of the more common organic causes.

Nothing about the case suggests migraine. In the absence of cranial trauma, a post-traumatic syndrome may be excluded. A thorough otologic investigation is imperative, and it should not be forgotten that such a syndrome may be caused by defective sinus drainage without active infection (Parkinson, S. N.: *Arch. Otolaryng.* 23:344 [March] 1936, and 24:594 [Nov.] 1936; *THE JOURNAL*, Jan. 21, 1939, p. 204). Any operative procedures on the sinuses should be avoided unless unequivocal pathologic changes are found.

A thorough ocular and oculomotor examination is essential, including emphasis on the activity of the intrinsic as well as the extrinsic eye muscles. A complete neurologic examination is indicated, including visual fields and cranial roentgenography to exclude intracranial tumor. A lumbar puncture is perhaps to be avoided because of the probability of postpuncture reaction in this patient. If, however, anything in the examination suggests an intracranial lesion, a lumbar puncture then becomes imperative.

After exclusion of organic causes, the psychic status of the patient should be investigated. This requires first of all an estimate of the personality basis and secondly an investigation of the immediate causative factors. The latter may after four years be somewhat obscured. The patient's symptoms now may be a habitual reaction to earlier incompatibilities. Often a combination of stresses will be found in the social, sexual, economic, intellectual and other spheres. As tact, skill, experience and

patience are necessary for such an investigation, a specialist in this field should conduct it. Often the revelation of the cause acts as a cure when understood and accepted by the patient. Prognosis will depend largely on the personality basis of the patient.

Sedatives per se are contraindicated as well as opiates and analgesics. Thyroid is of little or no value.

INTELLIGENCE QUOTIENT

To the Editor:—Have enough mass tests of the intelligence quotient by the Stanford-Binet and other methods been made to estimate the approximate number and percentage of the higher intelligence levels throughout the country or in New York? Can you tell me the approximate percentage, ratio or number of persons, or children alone, with intelligence quotients at levels of every 10 points including and above 160? What is the highest intelligence quotient recorded? At what age can the intelligence quotient first be considered as relatively stable for the rest of the child's testable age?

EMIL ROTHSTEIN, M.D., Brooklyn.

ANSWER.—Although many data have been collected concerning the Stanford-Binet intelligence tests, there are no complete data available of the approximate ratio or number of persons with intelligence quotients at every level. This would be possible only if the entire population were tested. The reports by Terman, Gesell and Pintner are informing. Most psychologists believe that an intelligence quotient of 190 is extremely rare. The relatively most stable period of establishing the intelligence quotient by the Stanford-Binet test is between the ages of 6 and 10 years.

The following references are recommended:

- Baldwin, B. T., and Stecher, L. I.: Additional Data from Consecutive Stanford-Binet Tests, *J. Educ. Psychol.* 13: 556, 1922.
Brown, R. R.: The Time Interval Between Test and Retest in Its Relation to the Constancy of the Intelligence Quotient, *ibid.* 24: 81-86, 1933.
Dearborn, W. F.: The Mental and Physical Development of Public School Children, *School & Soc.* 41: 485-593, 1935.
Pintner, R.: Intelligence Tests, *Psychol. Bull.* 32: 453-472, 1935.
Terman, L. M.: The Intelligence of School Children, Boston, Houghton Mifflin Company, 1919.
Young, K.: The History of Mental Tests, *Psych. Sci.* 31: 1-18, 1924.
Gesell, Arnold: Infancy and Human Growth, New York, Macmillan Company, 1928.

SOAP LAKE WATER FOR THROMBO-ANGIITIS OBLITERANS

To the Editor:—Do you have any information regarding the treatment of Buerger's disease at Soap Lake, Wash.? Presumably the patients are given baths of this water and also take water internally. I understand the government has built a hospital there for patients with this disease. We would appreciate any light thrown on the subject.

J. I. CHALEK, M.D., Minneapolis.

ANSWER.—A good deal has been written about the curative effects of water of Soap Lake for patients with thrombo-angiitis obliterans, or Buerger's disease. Several months ago one of the journals for the members of the American Legion carried an extensive article in which extravagant claims were made for the curative power of the water of Soap Lake. As far as known there has been no expert estimate by a physician of the beneficial effects of treatment of thrombo-angiitis obliterans at Soap Lake. Articles written by persons who are not physicians indicate an extreme lack of knowledge about the disease on which they write so freely.

DUCK SHOT IN EYE

To the Editor:—Have there been any reports of the effect or results following the introduction of duck shot into body tissue, duck shot at the present time being made of magnesium or an alloy of magnesium? I have a patient in whom such shot have been embedded in the orbital tissues.

PAUL G. MOORE, M.D., Cleveland.

ANSWER.—There are no reports on the effect of the introduction into the tissue of the orbit of shot composed of magnesium or its alloy. The presence of a foreign body produces well known effects, but whether or not the composition of such foreign bodies has a chemical effect on the tissue is not known.

CYSTOSCOPES

To the Editor:—What make and type of cystoscope would you advise for general diagnostic and therapeutic use in male and female?

M.D., Pennsylvania.

ANSWER.—There are many types of cystoscopes for special purposes. There are but a few that can be called universal in that they give satisfactory performances for observation, ureteral catheterization and operative cystoscopy. For general use, including the three mentioned, the Ravich universal cystoscope, which is a No. 21 French instrument, is satisfactory.

Council on Medical Education and Hospitals

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Thirty-Fifth Annual Meeting, held in Chicago, Feb. 13 and 14, 1939

(Continued from page 1189)

DR. J. H. MUSSER, New Orleans, in the Chair

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FEBRUARY 14—MORNING

The Program of the National Committee for Mental Hygiene

DR. CLARENCE M. HINCKS, New York: For thirty years the National Committee for Mental Hygiene, thanks to the support of philanthropic citizens and great foundations, has been enabled to conduct surveys, to support research, to set up experimental demonstrations and to be active in the field of health education. There was organized three years ago the Mental Hospital Survey Committee. Dr. Samuel W. Hamilton, Dr. Grover Kempf and others connected with the group conducted studies in forty states, affecting 169 hospitals, and made surveys in three Canadian provinces.

A number of mental hospitals have attained creditable standards and compare favorably with the better general hospitals of the country, but there are institutions with arrangements that are utterly inadequate and that are a discredit to present day civilization. The average ratio of medical personnel to patients in mental hospitals of the United States is 1:259 as against the accepted standard of 1:150, and the hospitals are understaffed in relation to nurses and other personnel. Only two states are free from overcrowding in mental institutions. To make provision for the hospitalization of persons requiring institutional care but not now receiving it, there are needed approximately 130,000 additional mental hospital beds in the United States. The number of beds for all classes of mental patients varies from 175 to 688 per hundred thousand in the various states. Political interference involves the personnel of hospitals with every change of administration in fourteen states and occurs occasionally in at least eight more. This circumstance constitutes a greater threat to sound administration than shortage of personnel and equipment. The average expenditure in the United States for the treatment of the mentally ill is 7.02 per cent of the states' income, with a range of from 2.83 per cent to 18.49 per cent. One state spends \$1.10 a day per patient for mental hospitalization, with another appropriating only 31.03 cents a day. The latter sum prohibits of course any genuine attempt to provide scientific and humanitarian services.

These facts are disconcerting and present a challenge to the nation to place essential services for the mentally ill on a basis in line with acceptable scientific standards. The situation demands the rating of mental hospitals to furnish the medical profession and the public with an indication of the status of institutional facilities in their particular state or locality.

The time has come, perhaps, for a reshaping of mental hospital arrangements. To meet the requirements of the aged and other groups, there are needed institutions with distinct hospital groupings, with various units specially designed, located and staffed for their specific purposes, with separate budgets, but with activities correlated and administered by a medical superintendent and his assistants.

While the national committee has had a profound interest in adequate hospitalization, its major concern has always been the prevention of mental disorders. We know that, in connection with the younger generation, 4 per cent will at some period in their lives enter mental hospitals as patients afflicted with insanity; that 2 per cent are mentally deficient, with insufficient capacity to compete on equal terms with their fellows; that 1 per cent will become delinquent, and that at least 8 per cent will be handicapped because of marked emotional instability, because of twists and distortions of personality and because of

nervous breakdowns and other forms of maladjustments. In other words, there are more than 5 million children in our schools today whose outlook is dark indeed because of precarious mental health, 5 million children who, in the absence of preventive measures, will ultimately cost this country hundreds of millions of dollars in the upkeep of mental institutions, jails and relief agencies and who are destined to add greatly to the sum total of human unhappiness and inefficiency.

Prevention can be fostered through cooperative undertakings with the teaching profession and through the activities of physicians in the education of patients and the public in mental health matters. There is presented here a challenge to medical men in the extension of their educational efforts with the public, to include matters relating to mental as well as physical hygiene.

The national committee is appreciative of the fact that trained personnel is requisite for all mental hygiene undertakings. It has given attention to the training of nurses, social workers and teachers. There is need for the continued activities of the Council on Medical Education and Hospitals of the American Medical Association in connection with internships in mental hospitals and related efforts. Of fundamental importance is the conduct of educational work to reach the men who are now actively engaged in medical practice throughout the country.

The problems presented by mental disorders will become more and more acute unless adequate arrangements are made for the prosecution of research to point the way to more effective programs of prevention and treatment. The national committee has been sensitive to this need for research and, through annual grants from the Scottish Rite Masons of the Northern Jurisdiction of the United States, is subsidizing eighteen research projects in dementia praecox. In addition a study has been made of the present status of research and the possibilities for further development in the publicly supported mental hospitals of the country. It was found that twenty of the 273 public institutions were well organized and staffed for investigatory work and that an additional thirty-two hospitals offered distinct possibilities for research. However, too little attention has been devoted to research activities in this domain. It is interesting to note that, in the field of industrial research, there are in this country 40,000 workers in 1,600 laboratories involving an annual expenditure of 300 million dollars. Psychiatric research has less than 1 per cent of such resources and personnel. What a contrast, and what a challenge to effect a more even balance in our civilization!

Fundamentals of Industrial Hygiene

DR. T. LYLE HAZLETT, Pittsburgh: Industrial hygiene may be defined as the application of medical science to health and its preservation among the working population with the object of establishing the most healthful environment for the worker. Medical service in industry can be divided into three cycles. The first cycle was prior to 1910, when such service was practically unknown. Employees injured while at work were sent to the office of the nearest physician, and the management gave little thought to the surgical care and rehabilitation of injured employees. The second or surgical cycle was predominant from 1910 to 1925, during which years came the development of the group system of production, with an increased concentration of workers. The greatest source of traumatic injuries during these years was in industry, and the result was the enactment of compensation laws. It became apparent in 1913 that many injuries could be prevented, and in that year the National Safety Council came into existence. The third cycle, which began in 1925, can be termed the medical-engineering cycle, since it became evident that many conditions existed in industry that had some bearing on the health of employees. During the last few years more attention has been given to the working environment in its relation to the well-being and conservation of health among workers. Thus there has been opened a new field of preventive medicine, with an industrial application. This requires active participation by physicians working in cooperation with engineers to determine actual measurements of existing conditions so that adequate control measures may

be instituted. Recently some twenty-one states have added occupational disease acts to their compensation laws and there seems to be a gradual tendency to increase the number of so-called occupational diseases. In addition, many cases are being carried to the civil courts and are a subject of much concern.

In 1936 an industrial hygiene department was established at the University of Pittsburgh School of Medicine with the object of providing undergraduate and graduate instruction in industrial medical problems and establishing facilities for research on specific industrial problems as they pertain to the health and well-being of workers. In conjunction, an analytic laboratory has been established and hospital facilities are available for the investigation of occupational diseases, together with fellowships for graduates who desire to do such research work on industrial medical problems. An intensified graduate course of one week was offered last year and was well received.

Perhaps 90 per cent of the medical graduates have in the first years of practice some industrial or insurance contacts which bring them into the compensation field. Consequently there has arisen the necessity for extending the curriculum in our medical schools to provide instruction in industrial hygiene in its application to industrial life and to preventive medicine in industry. This can be done only by making this subject an entity in present day medical education. The part the physician should take and the responsibilities he should assume may be presented under four captions: 1. Safeguarding the health of the industrial workers in relation to their working environment. This includes air hygiene, lighting, noise, fatigue syndrome, sanitation, and placement of workers both from a mental and from a physical standpoint; making periodic examinations, especially of workers in known health hazards, and making definite recommendations to the management for the elimination of any unhealthful practices. 2. Medical care of occupational injuries and diseases and emergency medical care of nonoccupational illnesses occurring while the worker is on duty. 3. Research work. The constant development of new processes, new materials and new combinations of materials and their effects on the human body present to the graduate in medicine today his greatest opportunity in the study of occupational environment and in exploring new frontiers. 4. Health education. Much can be accomplished in an educational manner on the subjects of tuberculosis, heart disease and syphilis, for no group is more easily accessible or more desirous of knowing simple health facts than the industrially employed. If physicians do not realize the value of this avenue of transmitting worthwhile medical knowledge they will be acting contrary to the concepts of preventive medicine in its fullest extent.

It behooves them to assume the responsibility of guiding industry in its intra-industrial medical problems. Medical teaching institutions must give serious consideration to additional instruction so that the students may be able to assume their place in this age of complex and changing relationships in industrial life.

The Relation of Anesthesiology to Medical Education

DRS. RALPH M. WATERS, H. R. HATHAWAY and W. H. CASSELS, Madison, Wis.: This paper will be published in full in *THE JOURNAL*.

Tenure of Members of the Faculties in the Medical Schools

A. J. CARLSON, PH.D., Chicago: A questionnaire was mailed to the deans of the eighty-seven medical schools in the United States and Canada. Returns came in from eighty-five. This nearly 100 per cent response, I believe, stands as a record, and to it any merit in my summary and comments is largely due.

It appears on the returns that in fifteen medical schools indefinite tenure obtains at all ranks. I do not believe this is true. There must have been carelessness in checking. There should not, in my opinion, be initial indefinite tenure at the instructor rank. One should have a probationary period of from three to six years, during which time the instructor demonstrates his capacity in teaching and research. The large

number of schools, thirty-four, listed as having annual or biannual appointments of all ranks is also misleading. This group includes the medical schools in state universities, where state laws stipulate this kind of tenure. Actually, even on these faculties the full professor and in some cases the associate and assistant professor have, by practice, indefinite tenure. Indefinite tenure is accorded in eleven schools only to the full professors, in seventeen schools to the associate professors and in twelve schools to assistant professors also.

Apart from the importance of freedom and tenure for the highest performance in teaching and research, annual, biannual or term appointments, after the period of apprenticeship has passed, result in a less careful scrutiny of the performance of staff members by such responsible officers as chairmen of departments and deans. Also the failure to reappoint is a too ready and tempting door of exit in case of personal jealousy and prejudice, which one does not like to drag into the open, as would be done if discontinuance of service had to be preceded by a real hearing on the quality of performance.

Dismissal is accomplished by faculty vote in three schools, after recommendation of a committee of the faculty in twenty-two, on recommendation of the chairman of the department in eighteen and after a hearing before a committee in six. Forty-eight schools make no provision for a hearing.

Over half of the medical schools report that no provision for a genuine hearing exists in the statutes, by-laws or traditional administrative procedures of their school. I do not think that the majority of the executive officers (chairmen, deans, presidents, trustees) are that arbitrary. I think at least some of the deans made an error in checking on this item. But there are the figures. Twenty-five schools report that there is action by the faculty or a committee of the faculty prior to dismissal. This usually implies some form of a hearing for the party under accusation. In the case of the eighteen who dismiss on recommendation of the chairman alone, the accused party may or may not have a chance to be heard. Such hearings as are afforded are a matter largely of generosity and good sense rather than of requirement by the legal setup of the school, whether public or private. Trustees or governing boards are the legal entities of the school, and these legal entities usually have the power, under state laws or articles of incorporation, to dismiss a staff member at any time, without hearing and without giving any reasons for the dismissal, just as in a business corporation. The administration of a medical school worthy of the name must be above suspicion. Star chamber methods are out. Even a professor is entitled to be judged by his peers.

In the evolution of more efficient administrative procedures in medical schools these primary elements in the problem must be kept in mind: Real teaching and high grade research are most difficult tasks. Men with the high and rare powers involved can be neither driven nor commanded. Their performance flows from within, from the light and power of the individual. The essential administrative problem is the creation and maintenance of a milieu most suited to the labors of such men. It is slowly being learned, what should have been clear without experiment, that full time service on a medical faculty, despite its significance for research, is no cure-all as regards poor teaching. Not enough clearly superior men have been attracted to the profession to staff the faculties of medicine. What is to be done, in justice to the students, with those staff members who, because of sickness, premature senility, laziness or other misfortunes, fail to perform according to the promise of their earlier years? I think that the schools should act in their cases more frequently and objectively than they do. Throwing these men out does not seem a satisfactory answer, especially if the school has used what gifts they have until they are past 40. If there is going to be some such thing as an equity in one's post in relation to performance and time, it would seem that a person who has served society to the best of his ability even for five or ten years has earned part of the financial compensation due him after a service of thirty or forty years.

(To be continued)

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

- ALABAMA:** Montgomery, June 20-22. Sec., Dr. J. N. Baker, 517 Dexter Ave., Montgomery.
- ARIZONA:** Phoenix, April 11-12. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.
- ARKANSAS:** *Medical (Regular).* Little Rock, June 8-9. Sec., State Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, 317 State Line, Texarkana. *Medical (Eclectic).* Little Rock, June 8-9. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.
- CALIFORNIA:** *Written examinations.* San Francisco, July 10-13, and Sacramento, Oct. 16-19. *Oral examinations* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, August 7, and San Francisco, Nov. 15. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.
- COLORADO:** Denver, April 5-7. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.
- CONNECTICUT:** *Basic Science.* New Haven, June 10. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven.
- DELAWARE:** Dover, July 11-13. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.
- DISTRICT OF COLUMBIA:** *Basic Science.* Washington, June 26-27. *Medical.* Washington, July 10-11. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.
- FLORIDA:** Jacksonville, June 19-20. Sec., Dr. William M. Rowlett, Box 786, Tampa.
- GEORGIA:** Atlanta, June. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.
- HAWAII:** Honolulu, April 10-13. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.
- IDaho:** Boise, April 4-7. Address, Dir., Bureau of Occupational License, Rm. 355, State Capitol Bldg., Boise.
- ILLINOIS:** Chicago, April 11-13, June 20-22, and Oct. 17-19. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.
- INDIANA:** Indianapolis, June 20-22. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.
- IOWA:** *Basic Science.* Des Moines, April 11. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, State Department of Health, Capitol Bldg., Des Moines.
- KANSAS:** Kansas City, June 13-14. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.
- KENTUCKY:** Louisville, June 7-9. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.
- MARYLAND:** *Medical (Regular).* Baltimore, June 20-23. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, June 20-21. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.
- MICHIGAN:** Ann Arbor and Detroit, June 14-16. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.
- MINNESOTA:** *Basic Science.* Minneapolis, April 4-5. Sec., Dr. J. Charney McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, April 18-20. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.
- MISSISSIPPI:** Jackson, June. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.
- MONTANA:** Helena, April 4-5. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.
- NEBRASKA:** *Basic Science.* Omaha, May 2-3. *Medical.* Omaha, June 8-9. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.
- NEVADA:** Carson City, May 1-3. Sec., Dr. John E. Worden, Capitol Bldg., Carson City.
- NEW JERSEY:** Trenton, June 20-21. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.
- NEW MEXICO:** Santa Fe, April 10-11. Sec., Dr. Le Grand Ward, 115 Sena Plaza, Santa Fe.
- NEW YORK:** Albany, Buffalo, New York, and Syracuse, June. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, State Education Department, Albany.
- NORTH CAROLINA:** Raleigh, June 19. Sec., Dr. William D. James, The Hamlet Hospital, Hamlet.
- NORTH DAKOTA:** Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, 414 S. Third St., Grand Forks.
- OKLAHOMA:** *Basic Science.* Oklahoma City, May 15. Sec. of State, Hon. C. C. Childress, State Capitol, Oklahoma City. *Medical.* Oklahoma City, June 14. Sec., Dr. James D. Osborn, Jr., Frederick.
- OREGON:** *Basic Science.* Corvallis, July 8, and Portland, Oct. 28. Sec. State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.
- PENNSYLVANIA:** Philadelphia and Pittsburgh, July. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, 400 Education Bldg., Harrisburg.
- RHODE ISLAND:** Providence, April 6-7. Chief, Division of Examiners, Mr. Robert D. Wholey, 366 State Office Bldg., Providence.
- SOUTH CAROLINA:** Columbia, June 27. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.
- SOUTH DAKOTA:** Rapid City, July 18-19. Director, Medical Licensure, Dr. G. J. Van Hensvelen, State Board of Health, Pierre.
- TEXAS:** June. Sec., Dr. T. J. Crowe, 918 Mercantile Bldg., Dallas.
- VERMONT:** Burlington, June 14-16. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.
- VIRGINIA:** Richmond, June 21-23. Sec., Dr. J. W. Preston, 301 Franklin Road, Roanoke.
- WISCONSIN:** Milwaukee, June 27-30. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, March 25, page 1189.

Maine November Examination

Dr. Adam P. Leighton, secretary, Maine Board of Registration of Medicine, reports the written examination held in Portland, Nov. 8-9, 1938. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Ten candidates were examined, five of whom passed and five failed. Three physicians were licensed by reciprocity and three physicians were licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Boston University School of Medicine		(1938)	88
Tufts College Medical School		(1937)	79
Jefferson Medical College of Philadelphia		(1937)	81
University of Vermont College of Medicine		(1937)	80
McGill University Faculty of Medicine		(1937)	91
School	FAILED	Year Grad	Per Cent
Medizinische Fakultät der Universität Wien		(1936)	73
Friedrich-Wilhelms Universität Medizinische Fakultät, Berlin		(1919)	70
Georg August Universität Medizinische Fakultät, Göttingen		(1924)	70
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn		(1933)	69
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia		(1935)	74
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Univ. of Michigan Department of Med and Surgery		(1899)	Michigan
University of Michigan Medical School		(1928)	Michigan
University of Virginia Department of Medicine		(1931)	Virginia
School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Tufts College Medical School		(1932) N B M Ex.	
Cornell University Medical College		(1934), (1936) N B M Ex.	

North Carolina Reciprocity and Endorsement Report

Dr. W. D. James, secretary, North Carolina State Board of Medical Examiners, reports fifteen physicians licensed by reciprocity and two physicians licensed by endorsement after an oral examination held at Raleigh, Dec. 12, 1938. The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Louisville Medical Department		(1911)	Kentucky
University of Buffalo School of Medicine		(1918)	New York
University of Rochester School of Medicine		(1930)	Maryland
Duke University School of Medicine		(1932)	W. Virginia
University of Cincinnati College of Medicine		(1931)	Ohio
University of Pennsylvania School of Medicine		(1935)	S. Carolina,
(1936) Pennsylvania			
Medical College of the State of South Carolina		(1921)	S. Carolina
McHerry Medical College		(1937)	Tennessee
Medical College of Virginia	(1931), (1935),	(1936)	Virginia
Univ. of Virginia Department of Med	(1927), (1933),	(1936)	Virginia
School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Duke University School of Medicine		(1934), (1936) N. B. M. Ex.	

Ohio Reciprocity and Endorsement Report

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports twenty-six physicians licensed by reciprocity and four physicians licensed by endorsement Oct. 4, 1938. The following schools were represented.

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Colorado School of Medicine		(1936)	New York
Indiana University School of Medicine		(1936, 2)	Indiana
University of Kansas School of Medicine		(1934)	Kansas
University of Louisville School of Medicine		(1937)	Kentucky
Tulane Univ. of Louisiana School of Medicine	(1932),	(1937)	Louisiana
University of Maryland School of Medicine and College of Physicians and Surgeons		(1930)	New York
Detroit College of Medicine and Surgery		(1927)	Michigan
University of Michigan Medical School	(1930), (1933),	(1933),	
(1934), (1936, 2) Michigan			
St. Louis University School of Medicine	(1936),	(1938)	Missouri
Jefferson Medical College of Philadelphia		(1933)	Penna.
Temple University School of Medicine		(1932)	New Jersey
McHerry Medical College		(1921)	Missouri
University of Pennsylvania School of Medicine		(1932)	Penna.
University of Vermont College of Medicine	(1936),	(1937)	Vermont
Medical College of Virginia		(1937)	Virginia
Marquette University School of Medicine		(1937)	Wisconsin
Laval University Faculty of Medicine		(1933)	New York
Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultása, Budapest		(1929)	New York
School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Georgetown University School of Medicine	(1934),	(1937) N. B. M. Ex.	
Harvard University Medical School		(1936) N B M Ex.	
Duke University School of Medicine		(1936) N B. M. Ex.	

Book Notices

Our Common Allment. Constipation: Its Cause and Cure. By Harold Aaron, M.D., Medical Consultant to Consumers Union of United States. Cloth Price, \$1.50. Pp 192, with 2 illustrations. New York: Dodge Publishing Company, 1938.

In his position as medical consultant to the Consumers' Union of the United States, Dr. Aaron has had occasion to acquaint himself with the composition of most of the laxatives, purgatives and gummy preparations which are now offered to the American people for the relief of constipation. All physicians can read the chapter on this topic with much interest and profit. Dr. Aaron has familiarized himself with the physiology of the colon so far as it is known; also the pathologic physiology of constipation. His pronouncements are unusually sane, and he is doing a service by showing people how much buncombe there is in much of what they have been told about the bowel. The book should help to clear people's minds of fear with regard to such things as intestinal auto-intoxication, acidosis and ptosis of the colon. It will tell them that most of what is called colitis today should not be called colitis and is not to be worried about, because it is not associated with any true inflammation or ulceration of the bowel. In these cases the bowel itself appears to be normal, but it tends to contract spasmodically and to excrete an excessive amount of mucus because of excessive stimulation by the patient's jangling nerves. Although the book was written primarily for a lay audience, it is decidedly worth reading by medical men and even by gastro-enterologists of some experience. For many patients a book like this could be useful. It will answer many of their questions and will give them many suggestions for the solution of their problem.

Allergic Diseases: Their Diagnosis and Treatment. By Ray M. Balfeat, M.A., M.D., F.A.C.P., Associate Professor of Medicine, University of Oklahoma Medical School, Oklahoma City, Oklahoma. Assisted by Ralph Bowen, B.A., M.D., F.A.A.P., Chief of Pediatric Section, Balfeat Hay Fever and Asthma Clinic, Oklahoma City. Fifth edition. Cloth Price, \$6. Pp. 547, with 145 illustrations. Philadelphia: F. A. Davis Company, 1938.

The first edition of this book was written for the instruction of the public. The fifth edition is primarily for the general practitioner. Unfortunately the gradation from the lay to the medical textbook has been incomplete. The information included is much too detailed for any lay reader and too little for the physician. The organization is poor. It is directed too much to arouse interest in scattered but practical questions rather than to give a coherent, well balanced discussion of allergy. The greatest fault probably lies in an almost complete lack of discussion of the theory of allergy, especially of the pathology and the pathogenesis of the allergic conditions. A general discussion of immunology is completely omitted. The book gives one the impression that allergic conditions of all types are in a large proportion of cases diagnosed by various types of cutaneous tests. Even in the chapters on urticaria and migraine this technic is almost completely relied on. Dietary studies through diaries and elimination diets are not given or discussed in these chapters. They are left for a brief final chapter, which is devoted primarily to recipes for wheat, egg and milk free preparations. These are excellent, but for their proper use the reader would have to consult a more thorough reference book. The chapter on allergic dermatoses is weak. It is devoted largely to case reports rather than to a thorough discussion of the pathology and clinical pictures of infantile eczema, atopic dermatitis and contact dermatitis. In the chapter on treatment of intractable asthma and bronchiectasis most of the thirty-eight pages are devoted to a discussion of the technic and benefits of iodized oil instillation. All references to this are from sources favorable to this therapy. Unfavorable criticism, as the review of the literature and the work by Crip and Hampsey, is completely ignored. Because of the brevity of theoretical discussion, erroneous impressions are given through such a statement, under the brief discussion of the chemistry of pollen (page 92), as "However, it is definitely shown that the substance to which patients develop a specific sensitivity is not protein." This conclusion is not accepted by most workers. Another error, which is serious from a practical rather than an academic point of view, is the statement (page 117) that horse sensitive patients

have symptoms from furniture containing horsehair. This material as prepared for such use is not capable of producing symptoms because of the processes used (usually hailing in alkalis and soaking in solution of formaldehyde). The pollen charts of various regions are numerous and excellent. The other illustrations are often unnecessary and meaningless (the pictures of a horse, cows, hogs, sheep, rabbits, common vegetables, a bag of flour, a loaf of bread and a labeled package of cereal, all to emphasize common causes of allergy). A few well chosen words supported by statistics would serve the intelligent reader to a greater purpose.

Heart Disease and Pregnancy. By Crighlon Bramwell, M.A., M.D., F.R.C.P., Physician, Manchester Royal Infirmary, and Edith A. Longson, M.B., Ch.B., D.P.M. With a Foreword by Sir Ewen Maclean, M.D., F.R.C.P., LL.D. Cloth. Price, \$3. Pp. 194, with 57 illustrations. New York, London & Toronto: Oxford University Press, 1938.

This small book contains considerable information, both pertinent and irrelevant; many of the illustrations and much of the text, however, present merely the fundamentals of heart disease and might well be omitted.

The authors give a valuable analysis of the data on 350 cases of their own and compare them with series already published by McIlroy and Rendel in 1931 (200 cases), Carr and Hamilton in 1933 (500 cases) and Watson in 1933 (240 cases). Of the authors' series 89.7 per cent were rheumatic, 4 per cent were congenital and 6.3 per cent were miscellaneous. Ninety-five patients had a trivial to slight amount of heart disease and three of these (3.2 per cent) died. These were called class 1. The other 284 had more severe heart disease, and of these twenty-two (7.8 per cent) died. These were called class 2. Thus there was a total mortality of twenty-five of the 379, or 6.6 per cent. There were 156 primigravidas; two of forty-four of class 1, or 4.9 per cent, died and eleven of 112 of class 2, or 10 per cent, died, making a total death rate among the primigravidas of 8.6 per cent (thirteen of 156). There were 223 multiparas; of fifty-one, belonging to class 1 one died (1.9 per cent) and of 172 belonging to class 2 eleven died (6.4 per cent), making a total death rate among the multiparas of 5.3 per cent (twelve of 223). There were twenty-four patients with auricular fibrillation in the whole series of 379 cases. The death rate among these was 29.2 per cent as compared with the total mortality of 6.6 per cent.

As the result of their observations the authors were inclined to modify their previous opinion and to believe that "although auricular fibrillation does undoubtedly add considerably to the risk of pregnancy it does not constitute a bar to pregnancy provided the patient can be kept under observation and receive adequate treatment." Their case 113 is of interest in this respect:

A working-class woman who was in the Manchester Royal Infirmary, with rheumatic heart disease, at the age of 16 in 1913 came under our care with auricular fibrillation, mitral stenosis and great cardiac enlargement, following her third confinement in 1923. Normal rhythm was restored with quinidine and was maintained for two years in spite of a further pregnancy with a normal confinement in 1924. In 1925 fibrillation recurred, and we therefore terminated her fifth pregnancy. Between 1926 and 1930 another pregnancy was terminated, and she had two natural abortions. In 1931 she again became pregnant but felt so fit that she begged us to allow pregnancy to continue. With much reluctance and no slight misgiving we ultimately gave our consent. She was delivered by cesarean section. Convalescence was uneventful. Six years have since elapsed and there is no evidence that her cardiac condition has been aggravated by this confinement. This woman is able to look after her home and three children single handed. To our knowledge she was fibrillating fourteen years ago and has been fibrillating continuously for twelve years. During that time she has given birth to two healthy children in addition to having two therapeutic and two natural abortions.

The authors have never used quinidine in the treatment of fibrillation in pregnant women, partly because of the danger of producing abortion but chiefly because the type of case with which they were dealing was not thought suitable for quinidine. With respect to congestive heart failure they write:

Twenty-six of the patients in our series exhibited evidence of heart failure with venous engorgement and edema at the time they first came under observation. Of these, ten died prior to or soon after confinement and four others are known to have died within the next six years, giving a total mortality of 53 per cent. Expressed in another way, out of fifteen of our patients who died from cardiac causes, either prior to or within six months of confinement, ten had exhibited signs of congestive heart failure when first seen. These figures speak for themselves.

The prognosis, however, is not always unfavorable, for five of our patients who developed congestive heart failure, during the later months of pregnancy, responded satisfactorily to treatment. Success in treat-

ment depends chiefly on the early recognition of signs of failure. For this reason we wish to emphasize the importance of adequate antepartum supervision, especially with a view to detecting heart failure in its initial stages.

Of 312 patients with valvular disease, 260 had mitral stenosis alone. The others had mostly aortic valve disease alone, of which there were six, or aortic complicating mitral. The mortality was highest in the uncomplicated mitral stenosis cases, with twenty deaths in 260 cases. There were only two deaths in the other fifty-two cases.

The authors disagree entirely with the statement expressed by Donovan in 1936 that congenital heart disease constitutes a contraindication to pregnancy. Only one of the sixteen cases caused them any anxiety and that case, Fallot's tetralogy, was not fatal. There were in the total series only five cases of thyrotoxic heart disease, and only twenty with a systolic pressure of 140 mm. or higher. Not a single case was diagnosed as cardiovascular syphilis. Their experience with therapeutic abortion they summarize:

Termination of pregnancy will not cure heart disease. It should only be performed when treatment of the heart condition has failed and when the continuance of pregnancy endangers life or entails grave risk of producing a permanent aggravation of the cardiac disability. In other words, in patients with heart disease the indications for therapeutic abortion are identical with the contraindications to pregnancy. When such patients are seen during the first three months, emptying the uterus is a relatively safe procedure. After the end of the third month the risk is greatly increased, in view of the danger from shock and hemorrhage. Then the wisest course is to allow pregnancy to continue until the child is viable, and to deliver by cesarean section.

Therapeutic abortion was performed in twenty-four of our cases (7 per cent), in eight on account of auricular fibrillation, in two for heart failure and in the other fourteen on account of the poor general condition of the patient or the fact that they manifested increasing respiratory distress, which did not respond to treatment. Two of these patients died (patients 175 and 260).

In this country there is a belief that cesarean section is to be avoided in most cases.

At the end of the book the authors write: "Taking all aspects into account, we consider that it is usually unwise for a woman with a slight heart lesion to have more than two children, and when the lesion is of moderate severity she should be content with one."

Manual of Diets, Montefiore Hospital, New York City. Third edition. Paper. Pp. 33. New York, 1938.

Although considerations of diet and nutrition are important in the management of any disease, not many hospitals have a formal committee on nutrition. The Montefiore Hospital of New York has such a committee, and for the guidance of physicians and other members of the staff this committee compiled a manual of diets, now appearing in the third edition. The manual sets forth a series of standard dietary prescriptions. Each diet appears in outline form, usually on a single page or less, and the information provided includes a list of indications, characteristics, foods allowed, foods to be avoided and a typical menu for one day. It might be well if future editions of this useful manual were to include menus for several days. Probably this isn't necessary, but such information would be useful to practitioners who desire to give suitable instructions for patients in the home. There are no data provided on the cost of special diets but it is mentioned that the average cost of a special diet is approximately 50 per cent greater than the average cost of a general or routine diet.

Electrotherapy and Light Therapy. By Richard Kovács, M.D., Clinical Professor and Director of Physical Therapy, New York Polytechnic Medical School and Hospital, New York. Third edition. Cloth. Price, \$7.50. Pp. 744, with 308 illustrations. Philadelphia: Lea & Febiger, 1938.

The publication of the third edition of this textbook within five years is an indication of its popularity and usefulness. An examination of the extensive revision and enlargement of this edition also reveals that the author has included many of the recent advances in the rapidly growing field of physical therapy in general and electrotherapy and light therapy in particular. There are enlargements of sections on newer methods in electrical treatment, with two new chapters on short wave diathermy and a new chapter on artificial fever by electrical means, as well as revision of the whole volume. While the book was primarily intended to present that part of modern physical therapy which practicing physicians may themselves carry on in their office, the scope is so broad that

It should be of value to students interested in a nonmathematical survey of the physics of electricity and radiant energy and the physiologic principles involved in the production or use of electrical and radiant energy in the body. The book begins with basic electrophysics, avoiding a complicated mathematical approach, and leads up to the physics of various electromedical currents and radiant energy, along with a description of the devices producing them and their physiologic effects. The description of the basic physiology of electrical stimulation and the theories of bio-electric currents is more detailed than that in most physiology textbooks. There is a valuable new chapter, for instance, correlating electrophysiology with electrotherapy and an expansion of many chapters on general theory such as those on galvanic current, electrophoresis and chronaxia. The last section of the book is devoted more particularly to applied electrotherapy and light therapy for the guidance of the physician. These details of clinical application seem quite complete, and they correlate the use of simpler methods of physical therapy with the more complicated electrical ones. Among the most important aspects of the book seem to be the well rounded discussions of various methods and theories, as well as the many references and the expanded glossary included.

Diseases of Women. By Ten Teachers under the direction of Clifford White, M.D., B.S., F.R.C.P. Edited by Sir Comyns Berkeley, Clifford White and Frank Cook. Sixth edition. Cloth. Price, \$6. Pp. 492, with 158 illustrations. Baltimore: William Wood & Company, 1938.

In this edition the section on the physiology and disorders of menstruation has been completely revised. These data in their new form are lucid, helpful and as accurate as a simplified version can be. The volume presents fewer of the homely old British usages, such as the brisk purge for any and all contingencies, the rather loose application of dilation and curettage, the tardy adoption of the intravenous route for the administration of fluids and the uterine injection of hot glycerin for acute endometritis. One might say that the book has been considerably polished up. Most important in this connection is a complete capitulation to the argument for the conservative versus the radical surgical management of acute and subacute pelvic infection. The former volume was to be strongly criticized for its obvious lack of conviction in this connection. In general the book is amazingly consistent, considering its compilation by diversified authors. No doubt the open critical analysis of each in relation to the work of the others contributes to this evenness. The book is sound, authoritative, simple and consistently helpful in spite of minor discrepancies.

Health in Middle Life. By Ethel Browning, M.D. Needs of To-Day Series No. 21, edited by W. E. Boardman. Cloth. Price, 3s. 6d. Pp. 249. London: Rich & Cowan, Ltd., 1938.

As more and more human beings survive middle age, the number of books of advice for people in this period increases. The reason is, of course, that the transition period is attended by many symptoms of a special type and that the average person has not been suitably informed as to the normal character of the changes that occur. This book, written by a British woman physician, opens with a discussion of the effects of middle age, particularly on the glands and on resistance to disease. It discusses the physical character of the man and woman of 40; then the transition period, and next the program to be followed after the transition period. It is a sane, dependable book of advice.

The British Encyclopaedia of Medical Practice Including Medicine, Surgery, Obstetrics, Gynaecology and Other Special Subjects. Under the General Editorship of Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D. Volume IX: Mumps to Pneumothorax, Spontaneous. Cloth. Price, \$12. Pp. 752, with 127 illustrations, including 10 plates. London & Toronto: Butterworth & Co. (Publishers), Ltd., 1938.

In this volume articles of special interest are concerned with the usual topics that would fall in the alphabetical classifications, but there are other special articles on such topics as professional negligence, edema (because the British spell it oedema), pain, paralysis, disputed paternity, the pituitary gland and pneumonia. Peptic ulcer is discussed by Dr. Thomas Hunt, edema by Jonathan C. Meakins of McGill University, thus far apparently the only Canadian to be selected as a contributor. This volume is well up to the standard of the previous items in this system of medical practice.

Medical Occupations Available to Boys When They Grow Up. By Leo M. Kilnefelter, B.S., M.A. Cloth. Price, \$2. Pp. 287, with 68 illustrations. New York: E. P. Dutton & Company, Inc., 1938.

The young man who is interested in learning some of the various ways in which medicine has extended its scope and something about the innumerable opportunities which now exist in fields closely associated with the practice of medicine will find in this guide book the necessary information. The author discusses the route by which one enters the practice of medicine and then has individual chapters dealing with the various technical specialties such as physical therapy, the clinical laboratory, and the x-rays; also chapters on dentistry, nursing, optometry, pharmacy and veterinary medicine. The book is written in the form of a conversation between a boy and a doctor. It is nicely illustrated and should be a most useful work for any boy finishing high school and ready to choose an occupation in the medical field.

Rheumatism. By Bertam S. Nissé, M.D., M.R.C.P., Hon. Physician, British Red Cross Clinic for Rheumatism, Peto Place, London. Cloth. Price, 5s. Pp. 168. London: John Bale Medico Publications, Ltd., 1938.

This little book is a simple attempt to describe briefly the differential diagnosis and principal aspects of treatment of so-called rheumatism, including rheumatic fever, fibrositis, arthritis and gout. There is possibly some oversimplification in presentation, and the list of useful methods of treatment, especially for rheumatoid arthritis, would require careful selection for the individual patient. The general practitioner whose knowledge of these diseases is extremely fragmentary would find this volume helpful, but it can scarcely be considered comparable to some of the other more complete and more scientific recent books on or reviews of the subject.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Revocation of License for Procuring Abortions.—The medical practice act of New York authorizes the board of regents of the University of the State of New York to revoke the license of any physician who undertakes or engages "in any manner or by any ways or means whatsoever to procure or to perform any criminal abortion." By authority of this act the board of regents revoked the license of the petitioner, a physician, whereupon he appealed to the supreme court of New York, appellate division, third department.

The evidence presented before the board of regents, said the supreme court, showed that three female special investigators of the state department of education visited the petitioner's office on separate occasions and that on the occasion of each visit the petitioner made a vaginal examination of the investigator, advised that a condition of pregnancy existed, stated that he was willing to perform an abortion and fixed a date for the performance of it. The evidence further showed that he charged a fee of \$5 for each examination and agreed to perform the abortion in each case for a fee of \$100 and an additional \$10 for the administration of the anesthetic. In the opinion of the court, the board of regents was justified in finding that the act in question had been violated. Accordingly, the court affirmed the action of the board of regents in revoking the petitioner's license.—*Kahn v. Board of Regents of University of State of New York (N. Y.), 4 N. Y. S. (2d) 233.*

Malpractice: Removal of Uvula and Soft Palate During Tonsillectomy.—The plaintiff, a minor, by his guardian ad litem sued the defendant for malpractice, alleging that during a tonsillectomy performed on him by the defendant the uvula and a portion of the soft palate were removed and the anterior and posterior pillars of the throat were injured. At the conclusion of the plaintiff's testimony, the trial court directed a verdict in favor of the defendant and the plaintiff appealed to the district court of appeal, second district, division 1, California.

The physician contended that the trial court properly directed a verdict in his favor because there was no medical testimony

adduced at the trial with respect to the propriety of his conduct. In this case, said the district court, the evidence revealed a situation which clearly takes it out of that class of cases in connection with which expert testimony is indispensable. The court then quoted from *Evans v Roberts*, 172 Iowa 653, 154 N W 923, as follows:

While it may be true that, had the operation upon the adenoids been unsuccessful and disappointing, no inference of negligence or want of skill would arise therefrom, it does not follow that this rule applies with the same force to an injury done by him to sound and undiseased parts of the plaintiff's person, which he was not called upon to treat and did not pretend to treat. If a surgeon, undertaking to remove a tumor from a person's scalp, lets his knife slip and cuts off his patient's ear, or if he undertakes to stitch a wound on the patient's cheek, and by an awkward move thrusts his needle into the patient's eye, or if a dentist in his haste, leaves a decayed tooth in the jaw of his patient and removes one which is perfectly sound and serviceable, the charitable presumptions which ordinarily protect the practitioner against legal blame where his treatment is unsuccessful, are not here available. "It is a matter of common knowledge and observation that such things do not ordinarily attend the service of one possessing ordinary skill and experience in the delicate work of surgery. It does not need scientific knowledge or training to understand that, ordinarily speaking, such results are unnecessary and are not to be anticipated, if reasonable care be exercised by the operator."

The court also quoted from *Ills v Ryan*, 8 Calif (2d) 82, 64 P (2d) 409, as follows:

Where the thing is shown to be under the management of the defendant or his servants, and the accident is such as in the ordinary course of things does not happen if those who have the management use proper care, it affords reasonable evidence, in the absence of explanation by the defendant, that the accident arose from want of proper care.

It would appear, continued the district court of appeal, to be a matter of common knowledge that the removal of a portion of the soft palate and of the uvula is no part of a tonsillectomy. The location of the tonsils is a matter easily observable to any one, and the location and function of the uvula and soft palate are matters of common knowledge and of which a court can take judicial notice. Therefore there was evidence in the record, at the time the motion for a directed verdict was granted, sufficient to support a verdict for the plaintiff had such verdict been returned. The trial court, therefore, erred in directing the verdict, the jury should have been permitted to determine the matter of the defendant's negligence. The judgment in favor of the defendant was accordingly reversed and the cause was remanded.—*Thomsen v Burgesson (Calif)* 79 P (2d) 136

Society Proceedings

COMING MEETINGS

American Medical Association, St Louis May 15-19 Dr Olin West, 535 North Dearborn St., Chicago, Secretary

Alabama Medical Association of the State of, Montgomery, April 18-20 Dr D L Cannon, 519 Dexter Ave., Montgomery, Secretary

American Academy of Tuberculosis Physicians, St Louis, May 13-14 Dr Arnold Minnig, 638 Metropolitan Bldg., Denver, Secretary

American Association for the Study of Gout, Cincinnati, May 22-24 Dr W Blair Mosser, 133 Middle St., Kline, Pa., Secretary

American Association for the Study of Neoplastic Diseases, Detroit April 6-8 Dr Eugene R Whitmore 2139 Wyoming Avenue N.W., Washington, D C., Secretary

American Association for Traumatic Surgery, Hot Springs, Va., May 8-9 Dr Ralph G Carothers, 409 Broadway, Cincinnati, Secretary

American Association of Anatomists Boston Apr 6-8 Dr E R Clark University of Pennsylvania School of Medicine, Philadelphia, Secretary

American Association of Genito-Urinary Surgeons, Williamsburg Va May 24-26 Dr Charles C Higgins, 2050 East 93d St., Cleveland, Secretary

American Association of Pathologists and Bacteriologists, Richmond, Va Apr 6-7 Dr Howard T Karsner, 2085 Adelbert Rd., Cleveland, Secretary

American Association of the History of Medicine, Atlantic City, N J, April 30-May 1 Dr Henry E Sigerist, 1900 Monument St., Baltimore, Secretary

American Association on Mental Deficiency, Chicago, May 3-6 Dr E Arthur Whitney, Washington Road, Elwyn, Pa., Secretary

American Dermatological Association, Montebello, Canada, May 31-June 1 Dr Fred D Weidman, University of Pennsylvania Medical Laboratories, Philadelphia, Secretary

American Gastro-Enterological Association, Atlantic City, N J, May 1-2 Dr Russell S Boles, 1901 Walnut St., Philadelphia, Secretary

American Gynecological Society, White Sulphur Springs, W Va., May 22-24 Dr Richard W TeLinde, 11 East Chase St., Baltimore, Secretary

American Heart Association, St Louis May 12-13 Dr Howard B Sprague, 50 West 50th St., New York, Secretary

American Laryngological Association, Rye N Y, May 24-26 Dr James A Babbitt, 1912 Spruce St., Philadelphia, Secretary

American Laryngological, Rhinological and Otolological Society Chicago May 10-11 Dr C Stewart Nash, 277 Alexander St., Rochester, N Y, Secretary

American Medical Legal Association Chicago, May 12-13 Dr Michel Pijon, 124 Commonwealth Ave., Boston, Secretary

American Otolological Society, New York May 22-23 Dr Thomas J Harris, 104 East 40th St., New York, Secretary

American Pediatric Society, Sky Top Pa., Apr 27-29 Dr Hugh McCulloch, 325 North Euclid Ave., St Louis, Secretary

American Physiological Society, Toronto Canada, Apr 26-29 Dr A C Ivy, 303 First Chicago Ave Chicago, Secretary

American Psychiatric Association Chicago May 8-12 Dr Arthur H Ruggles, Butler Hospital, Providence, R I Secretary

American Society for Clinical Investigation Atlantic City N J May 1-3 Dr Jerry Starr, University of Pennsylvania Hospital Philadelphia Secretary

American Society for Experimental Pathology, Toronto Canada April 26-29 Dr Paul R Cannon, Dept of Pathology, University of Chicago, Chicago Secretary

American Society for Pharmacology and Experimental Therapeutics Toronto, Canada Apr 26-29 Dr G Philip Grabfield 319 Longwood Ave Boston, Secretary

American Society of Anesthetists, New York Apr 14 Dr Paul M Wood, 745 Fifth Ave., New York, Secretary

American Society of Biological Chemists Toronto Canada Apr 26-29 Dr C G King, Univ of Pittsburgh, Dept of Chemistry, Pittsburgh, Secretary

American Society of Clinical Pathologists St Louis May 12-14 Dr Alfred S Giordano, 531 N Main St., South Bend Ind., Secretary

American Surgical Association Hot Springs, Va., May 11-13 Dr Charles G Mixer, 319 Longwood Ave., Boston, Secretary

American Therapeutic Society, St Louis May 12-13 Dr Joseph F Howard 1726 Eye St N W Washington D C, Secretary

American Urological Association White Sulphur Springs W Va May 29-June 1 Dr Clyde I Deming, 789 Howard Ave., New Haven Conn., Secretary

Arizona State Medical Association Phoenix, Apr 13-15 Dr D F Harbridge, 15 East Monroe St., Phoenix Secretary

Arkansas Medical Society Hot Springs National Park May 8-10 Dr W R Brookshire, 602 Garrison Ave., Fort Smith, Secretary

Associated Anesthetists of the United States and Canada St Louis May 15-16 Dr F H McMechan, 318 Hotel Westlake, Rocky River Ohio Secretary General

Association for the Study of Internal Secretions, St Louis May 13-14 Dr F Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary

Association of American Physicians Atlantic City, N J May 23-24 Dr Hugh J Morgan, Vanderbilt University Hospital Nashville Tenn., Secretary

Association of Military Surgeons of the United States Washington D C, May 8-10 Dr H L Gilchrist, Army Medical Museum, Washington, D C, Secretary

California Medical Association Del Monte May 1-4 Dr George H Kress, 450 Sutter St., San Francisco, Secretary

Connecticut State Medical Society, New Haven May 25-26 Dr Creighton Barker, 258 Church St., New Haven, Secretary

District of Columbia Medical Society of the, Washington April 23-27 Dr Theodore Wiprud, 1718 M St N W, Washington, Executive Secretary

Federation of American Societies for Experimental Biology, Toronto, Canada, Apr 26-29 Dr D R Hooker, 19 West Chase St., Baltimore Secretary

Florida Medical Association Daytona Beach, May 1-3 Dr Shaler Richardson, 111 W Adams St., Jacksonville, Secretary

Georgia Medical Association of Atlanta, Apr 25-28 Dr Edgar D Shanks, 478 Peachtree St N.E., Atlanta Secretary

Illinois State Medical Society, Rockford, May 2-4 Dr H M Camp 224 S Main St Monmouth Secretary

Iowa State Medical Society Des Moines Apr 25-27 Dr Robert L Parker, 3510 Sixth Ave., Des Moines, Secretary

Kansas Medical Society, Topeka, May 1-4 Mr C G Munns, 112 W 6th St., Topeka, Executive Secretary

Louisiana State Medical Society, Alexandria, Apr 24-26 Dr P T Talbot, 1430 Tulane Ave., New Orleans, Secretary

Maryland Medical and Chirurgical Faculty of, Baltimore, Apr 23-26 Dr Walter Dent Wise, 1211 Cathedral St., Baltimore, Secretary

Minnesota State Medical Association, Minneapolis, May 31-June 2 Dr B B Souster, 11 West Summit Ave., St Paul, Secretary

Mississippi State Medical Association, Gulfport, May 9-11 Dr T V Dye, McWilliams Bldg., Clarksdale, Secretary

Missouri State Medical Association, Excelsior Springs, Apr 10-12 Dr E J Goodwin, 634 North Grand Blvd., St Louis, Secretary

Nebraska State Medical Association, Grand Island, May 2-4 Dr R B Adams, 414 Federal Securities Bldg., Lincoln, Secretary

New Mexico Medical Society, Gallup, May 11-13 Dr L B Cohenour, 219 W Central Ave., Albuquerque, Secretary

New York Medical Society of the State of, Syracuse April 24-27 Dr Peter Irving, 2 East 103d St New York, Secretary

North Carolina Medical Society of the State of, Cruise to Bermuda, May 9-14 Dr T W M Long, Roanoke Rapids Secretary

North Dakota State Medical Association, Fargo, May 8-10 Dr Albert W Skelsey, 20 1/2 North Broadway, Fargo, Secretary

Ohio State Medical Association, Toledo, May 3-4 Mr C S Nelson, 79 E State St., Columbus Executive Secretary

Oklahoma State Medical Association Oklahoma City, May 1-3 Dr L S Willour, Third and Seminole, McAlester, Secretary

Society for the Study of Asthma and Allied Conditions Atlantic City, N J, Apr 29-29 Dr W C Spain, 116 E 53d St., New York, Secretary

South Dakota State Medical Association, Aberdeen, Apr 24-26 Dr Clarence E Sherwood, Madison, Secretary

Tennessee State Medical Association, Jackson, Apr 11-13 Dr H H Shoulders, 706 Church St., Nashville, Secretary

Texas State Medical Association of, San Antonio May 8-11 Dr Holman Taylor, 1404 West El Paso St., Fort Worth Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

S: 233-272 (Jan.) 1939

The Spastic Colon. J. O. Finney, Gadsden.—p. 231.

Management of Hypertension and Pregnancy. B. H. Boyd, Atlanta, Ga.—p. 237.

Anorectal Pain: Its Clinical Significance. J. E. Linn, Birmingham.—p. 242.

Exploring the Possibilities of Afebrile Brucellosis. E. Thantes, Mobile.—p. 245.

American Journal of Cancer, New York

35: 1-158 (Jan.) 1939. Partial Index

Mesonephroma Ovarii. W. Schiller, Chicago.—p. 1.

Some Transitional Gliomas. G. Levin, New York.—p. 22.

*Association of Silicosis and Carcinoma of the Lung. M. O. Klotz, Toronto.—p. 38.

Urine Extractives in Cancer. H. Sobotka and Edith Bloch, New York.—p. 50.

Occasional Neutralization of the Active Agent of Filtrable Fowl Tumors by Fluid Mediums from Tissue Cultures. R. J. Ludford, London, England.—p. 63.

Comparative Activity of Some Carcinogenic Hydrocarbons. J. M. Twort and C. C. Twort, Manchester, England.—p. 80.

Relation of Nursing to the Extrachromosomal Theory of Breast Cancer in Mice. J. J. Bittner, Bar Harbor, Maine.—p. 90.

Note on Production of Sarcomas in Hamsters by 3:4-Benzpyrene. W. E. Gye and L. Foulds, London, England.—p. 108.

Silicosis and Carcinoma of Lung.—Klotz reviews fifty cases of silicosis observed from 1925 to 1936 in the department of pathology and bacteriology of the University of Toronto. Twenty-five of these are from the necropsy files of the department, while in twenty-five the material was submitted by the department of health of Ontario for examination. Among these fifty cases, nine instances of carcinoma of various organs were found. This figure may possibly be too low, as the material submitted by the department of health consisted in most cases of only the thoracic organs. Four of the nine tumors were primarily bronchogenic. In 4,500 necropsies performed on patients dying in the Toronto General Hospital, 808 carcinomas of all organs were found. Of these, fifty-three were primarily bronchogenic. Both these figures are considerably lower than those of the first group. The average age incidence of those showing primary lung cancers in this larger series was 52 years and nearly all were laborers. Nine had given their occupation as miners, three as metal workers and two each as laborers, gardeners, gas company employees, engineers and laundry men. Among those describing themselves as miners, only one showed evidence of silicosis. Fourteen can be considered to have pursued occupations necessitating the inhalation of air containing either dust or other foreign matter. Though it is not entirely accurate to compare a selected group of fifty cases with a control group numbering 4,500, a comparison of the figures suggests that the incidence of carcinoma of the lung in silicosis may greatly exceed that among the population at large. The symptoms exhibited by the four patients with carcinoma of the lung found in the fifty cases of silicosis were not atypical for carcinoma of the lung. Dyspnea, cough, substernal pain, hemoptysis and loss of weight and strength were the prominent complaints. The duration of symptoms varied from three weeks to four years, with an average of twenty-five months. In case 4 the respiratory complaints were masked by those produced by metastatic destruction of various bony structures. In cases 1 and 3 bloody pleural fluid was obtained on thoracentesis. In no instance was an x-ray diagnosis made, though all the patients had been subjected to such an examination. The average age of these patients was 48 years and with one exception (five years) all had been exposed to silica for a period exceeding

twenty years. In case 1, in which the exposure was only five years, the lungs showed the most advanced degree of fibrosis and on analysis yielded the highest percentage of silica (33.98 per cent). The remaining cases showed only a minimal or slight degree of fibrosis attributable to the siliceous deposits. Case 2 alone presented evidence of tuberculosis and here the infective process had taken the form of a tuberculous bronchopneumonia. All the tumors were hilar in position, arising from the main bronchi on the left in three cases and on the right in one.

American Journal of Diseases of Children, Chicago

57: 245-488 (Feb.) 1939

Sternal Marrow of Children in Normal and in Pathologic States. P. Vogel and F. A. Bassen, New York.—p. 245.

Tests of Function of Vegetative Nervous System in Aerodynia. R. Day, J. R. Smith and W. O. Klingman, New York.—p. 269.

*Extrasystoles in Children. R. A. Lyon and Louise W. Raub, Cincinnati.—p. 278.

Gonorrheal Vaginitis of Children: Report of an Autopsy. R. A. Benson, A. Steer and F. D. Speer, New York.—p. 291.

Relation Between Plasma Protein Level and Edema in Nephrotic Children. L. E. Farr and D. D. Van Slyke, New York.—p. 306.

Congenital Enlargement of the Extremities. M. Cooperstock, Marquette, Mich.—p. 309.

*Prophylactic Use of Parental Blood Serum Against Contagion in a Pediatric Ward. L. H. Barenberg, D. Greene and M. J. H. Grand, New York.—p. 322.

Circulatory Function in Anemias of Children: II. Measurements of Blood Oxygen Content, Circulation Time and Venous Pressure. C. G. Parsons, Birmingham, England, and F. H. Wright, New York.—p. 330.

Experimental Poliomyelitis in Monkeys Lacking Olfactory Nerve Connections with Central Nervous System Produced by Intravenous Injection of Virus. J. A. Toomey, Cleveland.—p. 338.

*Distribution of Vitamin D in Body After Administration of Massive Doses. H. Vollmer, New York.—p. 343.

Extrasystoles in Children.—Lyon and Raub detected extrasystoles in thirty-five of 782 children attending children's cardiac disease clinics, in three of 5,114 newborn infants, in forty of 1,782 school children selected by the physicians of the schools from a school population of about 85,000 as having some cardiac abnormality, and in seven of 709 children in a single elementary school. Of 2,672 children with normal hearts, extrasystoles occurred in fifty-nine (2.2 per cent); of 468 patients with cardiac lesions the irregularity was observed in twenty (4.3 per cent). In some instances rheumatic fever, diphtheria, congenital heart disease or emotional or nervous instability seemed to be a predisposing cause of the condition, but usually no evident cause of the extrasystoles could be determined. According to the electrocardiograms of twenty-two children, the extrasystoles were ventricular in origin in sixteen, nodal in three and auricular in three. In only one patient was the origin multifocal. In a series of forty-two patients who were observed for periods of from one month to ten years the extrasystoles occurred at only one examination in thirteen instances and for from one to five months in fourteen others, from six to eleven months in four, from twelve to twenty-three months in six and more than two years in the remaining five. There was no evidence that the presence of extrasystoles, by themselves, either caused any impairment of cardiac function or retarded the growth and development of the child.

Parental Serum Against Contagion.—Barenberg and his associates used parental blood serum regularly in an active pediatric ward as a prophylactic measure against measles, diphtheria and scarlet fever. Each child admitted to the medical pediatric ward received from 20 to 30 cc. of parental blood serum. The serum was readily absorbed without any untoward effects. The surgical ward served as a control. The use of parental serum maintained a constantly open ward free from outbreaks of contagious disease, preventing the spread of these disorders among already sick children. This prophylactic measure also decreased the number of hospital days in the medical pediatric ward.

Distribution of Vitamin D in Body.—Vollmer determined the vitamin D content of the organs of a child who died of tuberculous meningitis and miliary tuberculosis. Three and a half days before he died the child was given 600,000 U. S. P. units of vitamin D orally. At this time he was still in a condition which probably allowed the absorption of most of the vitamin. Most of the vitamin was stored in the skin, liver and brain. The kidney contained less vitamin. No appreciable amounts of the vitamin were found in the lungs, spleen or bones.

American Journal of Medical Jurisprudence, Boston

2: 1-72 (Jan.) 1939

- Police Crime Prevention Activity. O. W. Wilson, Wichita, Kan.—p. 1.
 Determination of Compensation Liability: The Physical Examination and Collateral Medicolegal Factors. L. H. Childs, Flint, Mich., and C. D. Selby, Detroit.—p. 9.
 The Technical Investigation in Cases of Electrical Injury. A. W. Weeks, Boston.—p. 12.
 Carbon Monoxide, Chlorides in Drowning, Alcoholism. F. Stratton, Boston.—p. 21.
 Crime and Justice. S. Glueck, Boston.—p. 25.
 The Lay Roentgen Laboratory: Responsibility of Referring Physicians. J. S. Trostler, Chicago.—p. 37.
 The Business Problems of the Medical Profession. J. A. Slaughter, San Francisco, and L. S. Trigg, Los Angeles.—p. 39.
 The "Buck" Kelly Case. L. L. Stanley, San Quentin, Calif.—p. 45.
 Mental Disorders in the Course of Bullet Wounds of the Brain: Their Medicolegal Relationship. M. Rinkel, Brookline, Mass.—p. 49.

American J. Obstetrics and Gynecology, St. Louis

37: 1-182 (Jan.) 1939. Partial Index

- Incidence of Anovulatory Menstruation Among Patients of Low Fertility. J. Rock, M. K. Bartlett and D. D. Matson, Brookline, Mass.—p. 3.
 Degree of Normal Menstrual Irregularity: Analysis of 20,000 Calendar Records from 1,500 Individuals. L. B. Arey, Chicago.—p. 12.
 *Retinal Examinations: Guide in Management of Toxic Hypertensive Syndrome of Pregnancy. R. D. Mussey and B. J. Mundell, Rochester, Minn.—p. 30.
 Effects on Blood from Injections of Endocrine Principles in the Female. C. A. Hill, Pittsburgh.—p. 47.
 Effect of Quinine-Calcium on Uterine Motility. J. R. Johnson, Brooklyn.—p. 94.
 Routine Roentgen Pelvimetry in 600 Primiparous White Women Consecutively Delivered at Term. H. Thoms, New Haven, Conn.—p. 101.
 Role of Hysterectomy in Production of Menopausal Symptoms. A. L. Dippel, Baltimore.—p. 111.
 Endometrial Patterns in Dysmenorrhea. J. Kotz and Elizabeth Parker, Washington, D. C.—p. 116.
 Effect of Pregnancy and Corpus Luteum on Vesical Muscles. O. R. Langworthy and C. B. Brack, Baltimore.—p. 121.
 Hematometra. P. Bernstein and R. Walter, New York.—p. 126.
 *Insulin Treatment of Dysmenorrhea. Edna Watt Schrick, Lincoln, Neb.—p. 146.
 Effect of Irradiation on the Function of the Ovary in Young Girls. I. I. Kaplan, New York.—p. 158.
 Treatment of Vaginal Moniliasis with Silver Pionate. H. A. Shelanski and F. M. Kern, Philadelphia.—p. 161.

Normal Menstrual Irregularity.—Some 20,000 calendar records of menstrual cycles from about 1,500 women and girls, as given in twelve different studies, have been assembled, corrected and analyzed by Arey. The commonest length of 8,462 cycles (furnished by 585 persons) is twenty-eight days both for puberal girls and for adult women. The average length of all cycles is 33.9 days for girls and 28.4 days for women. The commonest length of 17,652 cycles (the grand mode of the individual modes of 1,265 persons) is divided between thirty and thirty-one days for puberal girls and is twenty-seven days for adult women. The mean length of cycle, based on individual averages, is 33.6 days for girls and 29.5 days for women. The maximal departures of individuals from their means extends from one to sixty-nine days in adults and from six to 211 days in puberal girls. In several hundred adults more than 21 years old, a fluctuation of about ± 2.5 days with respect to the mean expresses the limits of variability which contain two thirds of all cycles. Expressed differently, an average adult woman must expect one third of all her cycles to depart more than two days from her mean cycle length. The amount of variability shown by adults is greater than is ordinarily credited. Cycles ranging from two or three weeks to seven or more weeks appear in all of the groups (17 to 49 years) from which data have been collected. In the records of more than 500 women, 27 per cent never showed their own means during the observation period, which averaged eleven cycles. Only 20 per cent experienced their own mean in at least one third of their recorded cycles. The adults, reported in detail by eleven investigators, represent all ages from late adolescence to approaching menopause. They include American, Canadian, British, German and Hungarian subjects and various grades of society. In no instance did perfect menstrual regularity appear over any significant period of time; this is all the more noteworthy since many individuals had previously declared themselves to be the acme of invariability. It seems improbable that menstrual regularity, in any true sense of the word, ever will be encountered over significant periods of time. Certainly, not the slightest evidence pointing

toward perfect regularity has so far been produced for even a single exceptional individual. Should such a person be found at some future time, she will constitute a true medical curiosity. Studies on the monkey and chimpanzee disclose menstrual irregularity comparable to that of the human being.

Retinal Examinations.—Mussey and Mundell point out that the weight of evidence indicates that acute late toxemia of pregnancy presents a hypertensive syndrome, characterized by generalized spasm of the smaller arteries. The degree of the spasm appears to parallel the height and duration of the blood pressure and the severity of the toxemia. Examination of the arterioles of the retina reveals changes which apparently manifest the degree of angiospasm throughout the body. In addition to hypertension and other symptoms, the presence and persistence of noticeable retinal vascular spasm is a guide in the management of late toxemia. This often indicates the need of avoiding further generalized and, perhaps, permanent vascular damage by terminating pregnancy when the condition of the patient permits. On the contrary, retinal changes of comparatively mild degree, or their absence, may indicate that pregnancy may be allowed to continue in the hope of obtaining a living infant without unduly jeopardizing the health and life of the mother.

Insulin Treatment of Dysmenorrhea.—Schrick gave regular insulin for from two to three months to ten college students from 16 to 29 years of age with dysmenorrhea. The insulin was given for, from three to five days before each menstrual period. The menstrual periods of these women were regular and normal in all respects except for the association of pain of varying degrees of severity. Eight of the ten patients were benefited subjectively while under treatment, and three have had several menstrual periods free from pain without the use of insulin. The author has succeeded in relieving the cramplike pains of dysmenorrhea with a single injection of from 5 to 7 units of regular insulin given during the attack of dysmenorrhea with a supply of carbohydrate to counteract the antidiabetogenic effect of the insulin. This corroborates Altschul's observations. At present the author believes that insulin therapy in functional dysmenorrhea is successful because of its effect on the ovaries. The insulin treatment of this common complaint appears of value, but the subject needs further investigation.

Archives of Pathology, Chicago

27: 1-200 (Jan.) 1939

- Aplastic Anemia, with Special Reference to the Significance of the Small Lymphocytes. H. E. Jordan, Charlottesville, Va.—p. 1.
 Membrane Formation at Lipoid-Aqueous Interfaces in Tissues. G. M. Hass, Boston.—p. 15.
 Argemaffin (Carcinoid) Tumors of Small Intestine: Report of Eleven Cases and Review of the Literature. I. M. Ariel, New York.—p. 25.
 Malignant Cells in Serous Effusions. J. R. McDonald and A. C. Broders, Rochester, Minn.—p. 53.
 Negative Chemotropism in Leukocytes. M. McCutcheon, D. R. Coman and H. M. Dixon, Philadelphia.—p. 61.
 *Pituitary Fibrosis with Myxedema. B. Castleman and S. Hertz, Boston.—p. 69.
 Walker 256 Rat Mammary Carcinoma in Vitro: Further Observations. W. R. Earle, Washington, D. C.—p. 80.
 Use of Strip-Shaped Explants in Tissue Cultures. W. R. Earle, Washington, D. C.—p. 88.
 Malignant Tumor of the Great Omentum Simulating a Glomangioma. J. D. Kirshbaum and S. L. Teitelman, Chicago.—p. 95.
 Production of Renal Calculi in Guinea Pigs by Feeding Them a Diet Deficient in Vitamin A. M. Steiner, B. Zuger and B. Kramer, Brooklyn.—p. 104.
 Inflammation: XVII. Direct Effect of Changes in the Hydrogen Ion Concentration on Leukocytes. V. Menkin, Boston.—p. 115.
 Cardiac Muscles in Idiopathic Hypertrophy of the Heart in Infancy and in Normal Growth. G. J. Dammin and R. A. Moore, New York.—p. 122.
 Estrogens in Carcinogenesis. W. U. Gardner, New Haven, Conn.—p. 138.

Pituitary Fibrosis with Myxedema.—Castleman and Hertz cite a case of pluriglandular insufficiency without cachexia, clinically believed to be a case of myxedema. Except for the absence of cachexia, all the postmortem observations (fibrosis of the anterior lobe of the pituitary and atrophy of the thyroid, parathyroid, adrenal, ovary and uterus) are characteristic of Simmonds' disease. Pathologic and experimental evidence is presented which establishes primary disease of the anterior lobe of the pituitary in the pathogenesis. It is important to recognize that chronic pituitary insufficiency may exist.

Such a condition should be suspected in all cases of typical myxedema or in cases of myxedema in which earmarks of other endocrine deficiencies are present. A negative thyro-tropic assay of blood or urine in the untreated state of myxedema should suggest a primary deficiency of the pituitary.

Connecticut State Medical Society Journal, Hartford

3:51-104 (Feb.) 1939

- Mesenteric Cysts R L Dunne, Hartford—p 54
*Testosterone for Treatment of the Eunuchoid State K W Thompson, New Haven—p 59
What Should Be the Position of the Medical Profession in the Modern State? D P Griffin, Bridgeport—p 61
Sciatic Neuralgia B S Brady, New Haven—p 66
Technic, Physiology and Results in the Application of Therapeutic Hyperpnea I Kopp, Boston—p 68
Bromide Intoxication P W Freu, New Haven—p 75

Testosterone for Treatment of the Eunuchoid State.—Thompson states that the greatest success with testosterone has been obtained in eunuchoid patients who have either failed to attain normal sexual development or who have been castrated by accident or surgical necessity. The optimal dosage for a eunuchoid adult is approximately from 50 to 75 mg of testosterone propionate weekly, divided in two or three doses. After a preliminary saturation with the compound the maintenance dose may be lowered. Some patients develop a tolerance to the drug, so that later the maintenance dose has to be raised. The patients are instructed to make the injections and they adjust the dosage to their needs. Beneficial effects are observed from two to ten days after the injections are begun. Excessive doses have produced priapism, an increase in body weight and a generalized puffy edema, acne of the face and trunk and precordial pain. The latter symptom was so pronounced in one patient that the treatment had to be abandoned. No other untoward results have been reported, but more time must pass in order to evaluate the results and the dangers of the treatment. The drug is an effective therapeutic agent the clinical application of which deserves further study. It may prove to be an indispensable natural form of therapy in cases of primary deficiency of the testes. In other disorders having a psychic or constitutional origin, in which the testes are either secondarily or only apparently involved, the results may be harmful or ineffective. This drug is now being sold in many drug stores, at which it can be purchased without a prescription. At present the cost of this material and the lack of public knowledge of its action temporarily serve to prevent its unsuitable exploitation. New and cheaper methods for its synthesis will probably be developed and thus with the public's knowledge of its psychic, emotional and physical effects may bring about the necessity for controlling its sale. The principles of therapy with testosterone are not sufficiently well established to recommend its use by the physician in general practice. For a time, at least, it should continue to be studied in the clinic having the guidance of physicians who have had experimental and clinical experience with the endocrine glands and the advice of a psychiatrist, whose aid may be needed to solve the many psychic problems which confront these patients.

Georgia Medical Association Journal, Atlanta

28:1-46 (Jan.) 1939

- Maternal Mortality S S Smith, Athens—p 1
Some Practical Points in Meeting Poor Surgical and Anesthetic Risk in Surgical Diseases T J Collier, Atlanta—p 4
*Classification and Treatment of Obesity J K Fancher, Atlanta—p 7
Dissecting Aneurysm of the Aorta Report of Case T S Claiborne, Atlanta—p 12
Surgical Treatment of Gallbladder Disease J C Patterson, Cuthbert—p 13
Value of Aschheim Zondek Test in Diagnosis of Chorionepithelioma M T Benson Jr, Atlanta—p 16
Enrichments on Physicians' Rights A A Rayle, Atlanta—p 18
Odd Allergic Cases M A Ehrlich, Bainbridge—p 20

Classification and Treatment of Obesity.—Fancher classifies obesity as exogenous, endogenous or mixed. Insufficient function of the thyroid, pituitary and ovaries may cause obesity. Hyperinsulinism is also a cause of overweight. Diets based on ideal and not actual weight are valuable. People are fully conscious of the value of a trim figure, though they may desire it more from the standpoint of beauty rather than from the standpoint of comfort and health. Men are more lax than

women in their attention to girth control and yet, as the chief wage earners, they should be the ones most vitally interested in this life-lengthening factor. There is just as much adipose tissue stored within the body around the vital organs as there is under the skin. Frequently a man will consult his physician for shortness of breath and a choking sensation on exertion or after a full meal, when the trouble is not primarily cardiac in origin but due to an excessive accumulation of adipose tissue about the heart and lungs and within the abdomen. A definite reduction in weight brings about a prompt and refreshing relief from the dyspnea and choking.

Journal of Immunology, Baltimore

36:1-82 (Jan.) 1939

- Serologic Studies of the Reptilia I Hemagglutinins and Hemagglutinogens of Snake Blood G C Bond, Lawrence, Kan—p 1
Id II The Hemolytic Property of Snake Serum G C Bond and N P Sherwood, Lawrence, Kan—p 11
Acquired Specific Supersensitivity (Allergy) to Simple Chemicals IV Method of Experimental Sensitization, and Demonstration of Increased Susceptibility in Individuals with Eczematous Dermatitis of Contact Type M B Sulzberger and A Rostenberg Jr, New York—p 17
Simple and Inexpensive Apparatus for the Desiccation of Biologic Materials from the Frozen State H W Scherp and T P Hughes—p 29
Nonspecific "Desensitization" Through Histamine L Farmer, New York—p 37
Quantitative Relation of Fibrinolysin and Antifibrinolysin B F Massell, J R Mote and T D Jones, Boston—p 45
Factors Affecting Quantitative Relation of Fibrinolysin and Antifibrinolysin J R Mote, B F Massell and T D Jones, Boston—p 59
Differences in Hemolytic Streptococcus Antifibrinolysins J R Mote, B F Massell and T D Jones, Boston—p 71

Journal-Lancet, Minneapolis

59:37-84 (Feb.) 1939

- Nonparasitic Cysts of the Liver F F Atix, Lewistown, Mont—p 38
Limitations of the Nonpadded Plaster Cast J A Evert, Glendive, Mont—p 42
Impliment of the Rectum J H Garberson, Miles City, Mont—p 44
*A Safer Technic in Cholecystectomy T L Hawkins, Helena, Mont—p 47
Intravenous Urography as an Aid to Surgery Improved Method for Better Visualization of the Upper Urinary Tract L L Howard, Great Falls, Mont—p 49
Postgraduate Surgical Study in Edinburgh W A Wright, Williston, N D—p 51
Ectopic Pregnancy C W Schoregge, Bismarck, N D—p 54
Penetrating Foreign Body Wounds of the Knee Joint C J Glaspel, Grafton, N D—p 56
Pseudocysts of the Pancreas R E Weible, Fargo, N D—p 58
*Accurate Determination of Compatible Blood for Transfusion A L Cameron, Minot, N D—p 60
Treatment of Ruptured Duodenal Ulcer S A Donahoe, Sioux Falls, S D—p 63
Actinomycosis of Head and Neck Pathology, Diagnosis and Treatment O S Randall, Watertown, S D—p 64
The Prone Position for Gravity Drainage of the Abdomen T F Riggs, Pierre, S D—p 68
Educational Opportunities in Student Health Programs C E Shepard, Palo Alto, Calif—p 70

Cholecystectomy.—Hawkins enters a plea for a more or less routine procedure for cholecystectomy by downward dissection. He states that this procedure may be slower and, if the cystic artery is not previously clamped, more bloody, but he feels that these objections are negligible if such a procedure will lessen the number of inadvertent injuries to the common and hepatic ducts. After the abdomen is opened and the gallbladder is brought into the field, the liver may be manually rotated or the falciform ligament clamped and used as a retractor to tip the under surface of the liver to a more unobstructed view. The fundus of the gallbladder is grasped with rubber covered forceps and traction is applied upward. An elliptical incision is made about the grasping forceps through the peritoneal covering of the gallbladder. With small forceps the peritoneum is grasped and held by an assistant. The initial incision is continued down the inferior surface of the gallbladder and on to the cystic duct. Blunt dissection with small forceps is continued to free the gallbladder from the liver, and any troublesome bleeding points are cut and clamped. Gauze dissection is not used at any time. As the dissection proceeds downward, another rubber covered forceps may grasp the gallbladder lower to bring the cystic duct more directly in the operative field. The cystic artery should be ligated separately and for as long as possible so that

its ligated end may be finally closed over with peritoneum. When the junction of the cystic duct with the common duct is clear and distinct the cystic duct is doubly clamped, severed with a cautery and doubly ligated with chromic ligature. Stones may be palpated or the common duct explored at this time, a complete change of abdominal moist packs being inserted as a quarantine. If there is no jaundice present, the common duct is of normal size, no stones are palpable and aspiration reveals clear light colored bile further exploration is not necessary. The peritoneal flap resected from the gallbladder and cystic duct is sutured continuously over the stump of the duct and the ligated cystic artery along the bed of the liver, so that complete peritonization of the gallbladder area is obtained. The abdomen in the absence of common duct drainage is closed without drainage, the only exception being when the gallbladder has been torn inadvertently. In draining the common duct there are several pitfalls to be avoided: the incision in the duct need not be larger than to permit the insertion of a folded T drain or the removal of stones. Meticulous attention should be given to the condition of the rubber T tube. It should be thoroughly tested and inspected before insertion to ascertain that the rubber is vital and that no leaks are present.

Compatible Blood for Transfusion.—Cameron outlines the technic used at Trinity Hospital for the determination of the compatibility of blood for transfusion. The technic is a modification of the Landsteiner test tube method. Preliminary typing is carried out in order to reduce the number of compatibility tube tests necessary for selecting a donor. The typing and cross matching are not directly involved in this final determination, which concerns only the reactions seen in the test tubes. Ten test tubes are arranged in numerical order in a rack. Into the first five tubes is placed 0.1 cc. of a 5 per cent saline suspension of the donor's erythrocytes. To tubes 1, 2 and 3 is added the recipient's serum in the following amounts respectively: 0.1, 0.2 and 0.4 cc. and 0.4 cc. of the donor's serum is added to tube 4. Into tubes 6, 7, 8, 9 and 10 is placed 0.1 cc. of a 5 per cent saline suspension of the recipient's erythrocytes. To tubes 6, 7 and 8 is added the donor's serum in the following amounts, respectively: 0.1, 0.2 and 0.4 cc. and 0.4 cc. of the recipient's serum is added to tube 9. Physiologic solution of sodium chloride is added to the ten tubes in amounts sufficient to make the content of each equal to 1 cc. In tubes 1, 2, 3, 6, 7 and 8 occur the cross reactions between the serum of both the donor and the recipient in three different dilutions and their erythrocytes. In tubes 4, 5, 9 and 10 occur control reactions between serum and erythrocytes of the same origin in saline solution and between the saline solution and the erythrocytes alone of both the donor and the recipient. After preparation, the tube mixtures are allowed to stand for one and one-half hours, as delayed reactions are not uncommon. In approximately 4 per cent of tests between bloods of the same group incompatibility is found which is usually due to agglutination but occasionally to hemolysis. If the macroscopic evidence of agglutination is at all doubtful a microscopic examination is carried out. The author states that this test tube method has been relied on at Trinity Hospital for more than 1,200 transfusions performed during the last six years. No reactions of incompatibility have occurred. The extra time and effort which the test requires is fully justified by its incomparable superiority as a laboratory procedure on which life depends.

Journal of Nervous and Mental Disease, New York

89: 133-272 (Feb.) 1939

- Notes on the Psychology of Metrazol Treatment of Schizophrenia. P. Schilder, New York.—p. 133.
Cerebral Mechanisms. J. W. Papez, Ithaca, N. Y.—p. 145.
Postural Alterations in the Upper Extremity, with Some Comments on the Pyramidal Tract and Human Erect Posture. A. M. Rabiner, Brooklyn.—p. 160.
Hereditary Word-Blindness as a Defect of Selective Association: Case Report. W. Marshall, Appleton, Wis., and J. H. Ferguson, Ann Arbor, Mich.—p. 164.
*Vitamin B Deficiency and Nervous Diseases. F. H. Lewy, Philadelphia.—p. 174.

Vitamin B Deficiency and Nervous Diseases.—The epitome that Lewy presents on the relation of nervous disease and vitamin B deficiency is as follows: 1. Changes in the electrical irritability of the peripheral motor nerves apparently are the first clinical signs of a B avitaminosis. 2. At the same time

the pyruvic acid increases in the blood and urine, indicating a gradual vitamin B deficiency. 3. Simultaneously also the ketone bodies increase in the blood and urine, indicating a gradual exhaustion of glycogen. 4. The neuropathy can be cured by the administration of vitamin B as well as by the reconstruction of the glycogen stocks through the administration of carbohydrates supplemented by insulin. 5. The liver is the greatest storehouse of vitamin B and of glycogen. 6. The liver loses four fifths of its vitamin B stock in the first week of a diet deficient in vitamin B. 7. The liver proves to be severely damaged pathologically in such diseases in which a neuropathy or myelopathy is present. 8. After exhaustion of the "mobile" liver vitamin, its "fixed" depot in the nervous system begins to decrease. At this moment the nervous symptoms appear. 9. Clinical, pathologic and experimental experience suggests strongly that in diseases of the spinal cord, of the basal ganglions and of the hemispheres a vitamin B deficiency may also play a part. Considering these facts, it seems difficult to overlook the central position of the liver in the mechanism of the occurrence of certain nervous diseases. The liver harbors and eventually loses not only vitamin B but also A, C, D and others. For example, in lead poisoning one finds—in addition to the nervous signs which alone attract one's attention—paradontoses and final loss of the teeth due to an A avitaminosis, a tendency to hemorrhages producing the severe pains in the calves known from vitamin C deficiency and eventually an increased fragility of the bones. The neuropathies and myelopathies usually do not appear as accompaniments of the basic disease but after an interval of weeks, months and even years, as in the postencephalitic parkinsonism. They represent the metanotic type of disease, in other words an after-disease. The problem of the origin of nervous diseases should not be oversimplified by creating a new collection box labeled "B avitaminosis."

Medical Annals of District of Columbia, Washington

S: 1-30 (Jan.) 1939

- Comments on the Interpretation of Blood Pressure Measurements. L. B. Laplace, Philadelphia.—p. 1.
Lunacy Procedure Under the New Law. A. E. Marland, Washington.—p. 6.
Injection Treatment of Hernia: Results in 239 Cases. R. J. Carbo, Washington.—p. 10.
Roentgenkymogram in Cardiac Diagnosis. G. L. Weller Jr., Washington.—p. 13.
Second Annual Report of Diabetic Camp. S. Benjamin, E. C. Rice, K. H. Mish, H. Manchester and Ella Fraser, Washington.—p. 15.

New England Journal of Medicine, Boston

220: 85-128 (Jan. 19) 1939

- *Treatment of Gonorrheal and Rheumatoid Arthritis with Sulfanilamide. H. C. Coggeshall and W. Bauer, Boston.—p. 85.
Peptic Ulcer Considered from a Surgical Point of View. A. W. Allen and C. E. Welch, Boston.—p. 103.
Syphilitic Hepatitis with Jaundice: Report of Case. L. E. Parkins, Boston.—p. 106.
Note on Drainage of the Prevesical Space. R. Chute, Boston.—p. 108.
Streptococcal Disease. C. S. Keefer, Boston.—p. 109.

Treatment of Arthritis with Sulfanilamide.—Coggeshall and Bauer treated fourteen cases of proved and four of probable gonorrheal arthritis, two cases of gonorrhea and two cases of proved and two of probable gonococcal prostatitis with sulfanilamide. Sulfanilamide administered in large doses for two or more weeks appeared to be a specific chemotherapeutic agent for certain strains of gonococci because: 1. Infected synovial fluids can be sterilized in from forty-eight to seventy-two hours after the institution of therapy. 2. In seventeen of the eighteen cases in which a proved genito-urinary focus existed, no gonococci were found after the third day of treatment. These cases remained clinically cured during the follow-up periods. 3. The gonococcus complement fixation test failed to become positive in three cases of gonorrheal arthritis in association with infected synovial fluids. In nine of the remaining eighteen cases the complement fixation test became negative. 4. Nine of the proved and two of the probable cases of gonorrheal arthritis showed striking clinical improvement in from forty-eight to seventy-two hours after therapy was begun. 5. The end results in the fourteen proved and the four probable cases of gonorrheal arthritis were more satisfactory and took place in shorter periods of time than occurs with other forms of therapy. The toxic manifestations resulting from the administration of large doses of

sulfanilamide do not represent serious complications (except for the hematologic changes) and are corrected promptly when the drug is discontinued. A slow, progressive, subclinical hemolytic anemia occurred in thirteen of the twenty-eight cases. Leukopenia was observed in two cases. The erythrocyte sedimentation rates fell rapidly in the cases of gonorrheal arthritis showing striking and immediate relief.

New York State Journal of Medicine, New York

30: 101-190 (Jan. 15) 1939

- Surgery in Hyperthyroidism. F. H. Lacey, Boston.—p. 108.
*Kidney Function in Hyperthyroidism. E. C. Bartels, Boston.—p. 117.
Concerning Oxygen Want in Pilots Flying at 12,000 Feet Altitudes. A. L. Barachi, New York.—p. 121.
Report of Case of Boeck's Sarcoid with Constitutional Symptoms, Eye, Glandular, Pulmonary and Skin Lesions. L. F. Frissell and W. T. Neel, New York.—p. 124.
Drug Therapy in Some Common Otolaryngologic Conditions. R. Almour, New York.—p. 128.
"Status Thymicolymphaticus": Unusual Clinicopathologic Observations. T. C. Wyatt, Syracuse.—p. 132.
"Get Them Back"—Surgical Lessons from the War. C. W. Cutler Jr., New York.—p. 141.
Outline of Treatment for Syphilis: Methods and Technic Followed in the Department of Dermatology of the Vanderbilt Clinic: Part II of a Series. A. B. Cannon, New York.—p. 145.
Is the Practice of Medicine Becoming Too Scientific? W. A. Groat, Syracuse.—p. 157.

Renal Function in Hyperthyroidism.—Bartels states that hyperthyroidism, no matter how severe, does not affect or alter renal function as determined by the urea clearance test. In only six of twenty-three cases was the urea clearance test below the range of normal. This was of a minor degree; since five of the six occurred in patients more than 50 years of age, this change can be explained as some minor vascular renal disturbance common to patients of this age. No relationship was found between the urea clearance and the type of hyperthyroidism (either exophthalmic or adenomatous goiter), duration of disease, loss of weight, level of the basal metabolic rate or severity of the disease as indicated by the type of operative procedure employed. Patients with hyperthyroidism in the absence of cardiac failure or preexisting nephritis tolerate an abundance of fluid intravenously. The results also probably disprove the presence of a hepatic-renal syndrome, for, in spite of severe degrees of changes in hepatic function which have been found in cases studied at the Lahey Clinic, the kidney has escaped alteration in its function.

Psychiatric Quarterly, Utica, N. Y.

13: 1-202 (Jan.) 1939

- Electro-Encephalography. F. Lemere, Seattle.—p. 5.
The Therapeutic Promise of Foster Family Care for the Mentally Ill: Some Observations on Technic, Results Obtained and Potentialities, with Brief Case Summaries. N. J. T. Bigelow and Eva M. Schied, Utica, N. Y.—p. 16.
*Thyroid Therapy in a Series of Epileptics. G. J. Doolittle, Sonyea, N. Y.—p. 33.
The Involutional (Mental) Syndrome. G. M. Davidson, New York.—p. 42.
Pellagra: Report of Two Cases in Psychotic Patients. Alma Freeman, Poughkeepsie, N. Y.—p. 83.
Prostigmine Treatment of Myasthenia Gravis. F. M. Miller Jr., Utica, N. Y., and H. H. Dodds, Marcy, N. Y.—p. 90.
Technic of Insulin Shock and Metrazol Treatments. L. L. Bryan, Marcy, N. Y.—p. 96.
Results of Metrazol Therapy in Schizophrenia. N. Beckenstein, Brooklyn.—p. 106.
Insulin and Metrazol Therapy in Identical Twins. J. M. Murphy and H. Luidens, Willard, N. Y.—p. 114.
Subsequent Course in Series of Fifty-Five Insulin-Treated Patients. D. Ruslander, Buffalo.—p. 123.
Treatment of Schizophrenia with Sympathomimetic Drugs: Benzedrine Sulfate. E. Davidoff and E. C. Reifenstein Jr., Syracuse, N. Y.—p. 127.
Literacy and Mental Disease. B. Malzberg, Albany, N. Y.—p. 145.
*Comparative Study of Psychoses Among Negroes and Whites in the New York State Prisons. S. C. Karlan, Dannemora, N. Y.—p. 160.
Are Mental Diseases on the Increase? The Problem of Determination. H. B. Elkind, Boston.—p. 165.

Thyroid Therapy in Epilepsy.—In order to determine the primary effect on seizures and the secondary effects on basal metabolism, blood sugar, weight, tremor, blood pressure or pulse rate, Doolittle gave at first 0.032 Gm. and then 0.065 Gm. of thyroid extract to forty-seven patients with epilepsy. During administration the number of attacks increased in 53

per cent of the patients, decreased in 36 per cent and did not change in 10 per cent. In twenty-one patients the number of seizures increased for the three months following the withdrawal of the drug, and thirteen of these returned to the pre-treatment level nine months after withdrawal. An increase in the basal metabolic rate was observed in 91 per cent of the patients, an increase in blood sugar in 63 per cent, a loss of weight in 64 per cent, only 36 per cent showed tremor and 93 per cent showed a decrease in blood pressure; 84 per cent of the patients in whom a disproportionate fall of diastolic pressure was observed had increased attacks and 65 per cent showed increase in pulse rate. There seemed to be no relationship between the rapidity of the pulse and the number of attacks. About half of the patients were receiving phenobarbital. This sedation seemed to have no influence on the frequency of attacks under thyroid extract. The author feels that an improvement with respect to the number of attacks while under thyroid treatment was evident in from 35 to 40 per cent of the patients. From 60 to 65 per cent appeared to be made worse by the drug. Approximately the same percentages existed in correlating seizures with changes in basal metabolic rate, blood sugar, weight, blood pressure or pulse rate, and with incidence of tremor. A patient subject to unstable diastolic blood pressure or a diastolic blood pressure easily decreased by thyroid extract should not be given this drug.

Psychoses Among Negroes and White Persons in Prisons.—Karlan investigated all the first admissions to the Dannemora State Hospital from the New York State prisons from June 30, 1928, to June 30, 1938. These included 687 white persons and 188 Negroes. During these ten years there were 25,538 white and 5,494 Negro commitments to the institutions of the New York State Department of Correction. From his observations the author concludes that the incidence of psychoses in the general population is higher in Negroes than in white people. In the New York State prisons, Negroes and white prisoners are in a similar cultural and economic environment. The incidence of functional psychoses among Negro inmates is about the same as that among white prisoners. Negroes have therefore no racial predisposition to mental disease. The high incidence of mental disease among them is probably due to cultural, social and economic causes. The incidence of psychoses among prison inmates is from five to ten times as high as that of the general population. This is mostly due to the inherent constitutional instability of the criminal group.

Public Health Reports, Washington, D. C.

54: 59-94 (Jan. 20) 1939

- Basal Metabolism Tests on Disturbed Patients. C. K. Himmelsbach and Othilia T. Mertes.—p. 63.
Do Case Records Guide the Nursing Service? M. Derryberry.—p. 66.

54: 95-148 (Jan. 27) 1939

- Studies in Chemotherapy: VIII. Some Toxic Effects of Repeated Administration of Sulfanilamide and Sulfanilyl Sulfanilamide ("Disulfanilamide") to Rabbits and Chickens. S. M. Rosenthal.—p. 95.
Histopathologic Changes in Hens and Rabbits Following Administration of Sulfanilamide and Sulfanilyl Sulfanilamide (Disulfanilamide). A. A. Nelson.—p. 106.

Review of Gastroenterology, New York

6: 1-78 (Jan.-Feb.) 1939

- Relation of Traumatism to Peptic Ulcer. E. L. Kellogg and W. A. Kellogg, New York.—p. 1.
Studies on Humans with a New Secretagogue Meal. R. Upham and F. Spindler, New York.—p. 12.
Effect of Banana Feeding on Intestinal Flora and on Constipation in Children and Adults. L. Weinstein and M. Bogin, New Haven, Conn.—p. 21.
Food Allergy of the Digestive System. J. S. Smul, New York.—p. 26.
Angina Pectoris: Introduction. A. S. Hyman, New York.—p. 35.
Treatment of Angina Pectoris. J. B. Wolff, Philadelphia.—p. 36.
Relation of Gastrointestinal Disorders to Angina Pectoris and Other Acute Cardiac Conditions. W. A. Swalm and L. M. Morrison, Philadelphia.—p. 41.
Cardiovascular Factors in Angina Pectoris. V. A. Digilio, Philadelphia.—p. 46.
Pharmacology and Bio-Assay of Insulin-Free Pancreatic Extracts. J. C. Munch, Philadelphia.—p. 50.
Hepatic Insufficiency. M. E. Binet, Vichy, France.—p. 53.

Virginia Medical Monthly, Richmond

66: 65-128 (Feb.) 1939

- Washington's Predilection for Doctors and Doctoring. W. A. Wells, Washington, D. C.—p. 65.
- Recollections of a Country Doctor. M. O. Burke, Richmond.—p. 68.
- Experience with Prostatic Resection. E. W. Kirby and J. H. Neff, Charlottesville.—p. 73.
- Hemochromatosis: Study of Three Cases. N. Bloom, Richmond.—p. 79.
- Treatment of Painful Lesions of Anorectum in General Practice. G. W. Ault, Washington, D. C.—p. 86.
- Psychiatric Aspects of Physical Illness. J. R. Blalock, Marion.—p. 92.
- Hydatid Mole: Case Report. W. P. Barnes, Richmond.—p. 94.
- Correlation Between Pediatric, Psychiatrist and Psychologist. W. B. Melhwaite, Petersburg.—p. 96.
- The Blood Smear in Differential Diagnosis. J. H. Scherer, Richmond.—p. 99.
- Herniation of the Intervertebral Disk: Report of Two Cases. J. T. Rountree, Front Royal.—p. 103.
- Review of Literature on Mesenteric Adenitis. J. M. Emmett, M. Fliess and F. H. Yorkoff, Clifton Forge.—p. 105.
- Leukopenic Index in Pediatric Allergy. P. Hogg, Newport News.—p. 108.
- What Our Patients Think. A. J. Russo, Baltimore.—p. 109.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

47: 1-54 (Jan.) 1939

- Pituitary Gland in Relation to Metabolism. J. B. Collip, Montreal.—p. 1.
- *Influence of Pituitary in Thyroid Disease. W. O. Thompson, Phoebe K. Thompson, S. G. Taylor 3d and Lois F. N. Dickie, Chicago.—p. 4.
- Malignant Tumors of Thyroid Gland: Study of Eighty-Eight Cases. H. Wetti and R. Huguenin, Paris, France.—p. 10.
- Perforated Peptic Ulcer. H. G. Willard, Tacoma, Wash.—p. 23.
- Leiomyosarcoma of Stomach: Perforation. C. J. Baumgartner, Los Angeles.—p. 27.
- The Surgical Approach to Hypertension: Division III. F. M. Findlay, San Diego, Calif.—p. 31.

Influence of Pituitary in Thyroid Disease.—Two years ago the Thompsons and their collaborators reported that in about 50 per cent of patients showing various levels of thyroid function a temporary increase in basal metabolism could be produced by pituitary extracts containing the thyrotropic factor. They now extend and confirm these observations. Out of 123 courses of injections to 106 patients of all types, the basal metabolism was increased by 10 points or more in fifty-six instances. Considering only the initial series of injections, an increase was observed in fifty-one instances. The response was always temporary in spite of continued administration. The observations suggest that the maintenance of normal thyroid activity depends to some extent on factors outside the thyroid, among which the function of the anterior lobe of the pituitary plays an important part. They are consistent with the hypothesis that hypothyroidism may be of two types, primary and secondary. In the primary type the hypothyroidism is the result of loss of thyroid tissue by operation, atrophy or infection. It is seen in patients with marked myxedema, who show characteristic and complete improvement with the administration of desiccated thyroid. The secondary type is caused by lack of adequate stimulation of the thyroid, notably by the anterior lobe of the pituitary, and is seen in patients suffering from hypofunction of this gland, in Simmonds' disease and in certain pituitary tumors associated with a low basal metabolism. Hyperthyroidism, like hypothyroidism, may be secondary to a corresponding state in the anterior lobe of the pituitary. In twelve patients with myxedema and basal metabolism varying from minus 31 to 47 per cent, no increase in basal metabolism was produced by the administration of anterior pituitary extracts containing the thyrotropic factor. In about half of ninety-four other patients showing various levels of thyroid function from moderate hypothyroidism to marked hyperthyroidism, increases in basal metabolism of from 10 to 53 points were produced. The magnitude of the response appeared to be related to the level of metabolism before treatment was started, being greatest in the patients with mild hypothyroidism and least in the patients with hyperthyroidism. In nineteen patients with basal metabolic rates of from minus 29 to plus 8 per cent the rate was raised as high as 36 per cent above normal, and various manifestations of hyperthyroidism were produced: tachycardia, nervousness, tremor, emotional disturbances, weakness, ease of fatigue, loss of weight, increase in perspiration and increase in the size of the thyroid.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 51-96 (Jan. 14) 1939

- Outbreak of Psittacosis at the London Zoological Gardens. A. G. Troup, R. Adam and S. P. Redson.—p. 71.
- The "Medical Appendix" in Children and Adults. R. Miller.—p. 56.
- Treatment of Gonorrhea by Uleron: Review of 120 Male Cases. C. H. Wilkie.—p. 57.
- *Treatment of Sterility: Report on Sixty-Two Cases. Margaret Moore White.—p. 62.
- Auricular Fibrillation and the Thyroid. E. G. Slesinger.—p. 65.

Treatment of Sterility.—Between August 1937 and June 1938, sixty-two women who attended an outpatient department for sterility were observed and treated by White. Forty-seven of them complained of absolute sterility, nine of one child sterility, one that she could not become pregnant with a second husband (although she had had four children by the first husband) and five that they had had one or more miscarriages. By September 1938, twenty-two patients were pregnant—that is, 47.8 per cent of those in whom pregnancy was possible, since sixteen patients either had nonpatent fallopian tubes or their husbands were known to be sterile. Of the twenty-two who became pregnant seven miscarried, but two are now pregnant again. Of the remaining twenty-four women who have not yet become pregnant it is assumed that in 21 per cent the husband is sterile, judging from the result of the thirty-nine whose semen was examined; but this still leaves a number of women in whom so far pregnancy has not occurred though study of both partners has been favorable. Iodized poppyseed oil by itself has a therapeutic value in that it opens up the fallopian tubes. It would seem to be of greater use than air insufflation, because the latter ceases to distend as soon as the pressure is reduced. Forty patients injected with the oil received no glandular therapy and thirteen became pregnant. There was tubal occlusion or sterility of the husband in fourteen of these forty cases, so that a 50 per cent success can be attributed to the injection of the oil alone. It is known that the failure of many patients to conceive is due to failure of ovulation, and it is claimed that ovulation is more likely to occur after suitable administration of endocrine products. Dihydroxyestrin benzoate given in two weekly doses of 20,000 international benzoate units in the two weeks directly following the menstrual period, or as a larger dose of 50,000 international benzoate units about the twelfth day of the menstrual cycle, appears to have had some value. In cases in which the uterus is undersized, nidation of the fertilized ovum is more likely to occur if further development is brought about by more regular and prolonged glandular therapy. Failure of the fertilized ovum to embed is one of the causes of sterility. Investigation on the pregnandiol (excretion product derived from the corpus luteum) content in the urine at the time of ovulation in sterile patients is being undertaken. Insufficiency of the latter substance may be dependent on an insufficiency or an unbalanced output of anterior pituitary hormones. Sterility may depend on an incorrect balance between the follicular and luteinizing factors of the anterior pituitary gland. It is hoped that in time one may be able to isolate the hormones from the gonadotropic substance present in the urine of pregnant women and inject them into sterile women. Thyroid insufficiency (in both parties) may account for sterility, since Lawrence and Rowe (1928) have shown that 39 per cent of a series of patients with some degree of thyroid insufficiency were sterile. The treatment of as many as possible of the existing causes of sterility at the same time raises the fertility level and renders pregnancy more likely.

Edinburgh Medical Journal

46: 1-60 (Jan.) 1939

- Surgery of Malignant Disease of the Colon. D. Wilkie.—p. 1.
- Cancer. J. J. M. Shaw.—p. 17.
- Medical Education and Hospital Policy in Edinburgh. L. S. P. Davidson.—p. 20.
- Intracranial Tuberculoma. N. M. Dott and E. Levin.—p. 36.
- Some Observations on the Practice of Medicine. H. Douglas-Wilson.—p. 42.
- Some Biochemical Factors of Influenza and Other Viruses. M. Copisarrow.—p. 46.

Lancet, London

1: 69-128 (Jan. 14) 1939

- New Bones for Old. E. W. H. Groves.—p. 69.
Intestinal Stricture and Megalocytic Anemia. J. F. Brock.—p. 72.
*The Case for Prophylaxis with Sulfanilamide and Sulfapyridine. E. D. Hoare.—p. 76.
Dermatomyositis. A. W. Hendry and T. E. Anderson.—p. 80.
Acute Dermatomyositis Associated with Reticulo-Endotheliosis. J. H. Sheldon and Freda Young, histologic findings by S. C. Dyke.—p. 82.
Tetany in a Snedling with Latent Osteitis Fibrosa in the Mollier. C. Friderichsen.—p. 85.
Spinal Leptomenigeoma: Restoration of Function After Operation. R. M. Hill and J. Prentice.—p. 87.

Prophylaxis with Sulfanilamide Compounds.—Hoare records experimental data which appear to justify clinical trial of sulfanilamide derivatives in the prophylaxis of hemolytic streptococcus infections. Prophylactic immunization may be indicated under certain circumstances in maternity work, in association with tonsillectomy in a patient known to be a carrier of hemolytic streptococci and possibly to avert a dangerous extension of infection when operating on the mastoid or other acutely infected tissues. The possibility of prophylactic immunization in obstetric practice does not in the least warrant any abandonment of antiseptic or aseptic technic in the conduct of labor. The author found that mice can be protected against an infection by hemolytic streptococci (from 100 to 1,000 minimal lethal doses intraperitoneally) by the subcutaneous injection of a single dose of sulfapyridine within the previous forty-eight hours. With sulfanilamide a single subcutaneous prophylactic injection has but little effect, owing to its greater solubility, but good protection is obtained if, in addition to the prophylactic dose, the drug is given orally twice a day for three days after the infection by hemolytic streptococci. Repeated administration is necessary after infection if sulfapyridine is given orally. A high bactericidal power was demonstrated in the blood of uninfected patients during the puerperium, three under treatment with sulfapyridine and six with sulfanilamide. The suggested dosage is 1 Gm. of sulfanilamide or of sulfapyridine orally three times a day, beginning as soon as labor starts and continuing for three or four days.

Practitioner, London

141: 693-804 (Dec.) 1938

- Modern Treatment of Pneumonia in General Practice. G. E. Beaumont.—p. 693.
Management of Chronic Bronchitis in the Winter. F. H. Young.—p. 700.
Clinical Aspects of Influenza. J. G. Scadding.—p. 712.
Vaccines and the Common Cold. D. Embleton.—p. 725.
Winter Diarrhea in Infants. S. Graham.—p. 733.
*Skin Diseases in the Winter. H. D. Haldin-Davis.—p. 741.
Diet in Health and Disease: XVIII. Diet in Winter and Summer. V. H. Mottram.—p. 747.
Treatment of Pain in Severe Injuries. H. Balme.—p. 757.
Some Pains of Significance to the Surgeon. H. Dodd.—p. 765.
External Diseases of the Eye in School Children. A. Furniss.—p. 771.
Industrial Eye Injuries. J. Minton.—p. 782.
Prevention and Control of Puerperal Sepsis. W. C. W. Nixon.—p. 785.
Note on an Outbreak of Gastro-Enteritis at Haslemere, Surrey. J. E. Haine.—p. 789.

Cutaneous Diseases in the Winter.—Haldin-Davis considers the cutaneous diseases of winter under three divisions: the effects produced by cold alone, the results of exposure to conditions of cold and damp and the effects of cold on pre-existing dermatoses. Frostbite is due to the action of cold, especially of dry cold, and its effects are often increased by the wind. Three degrees of severity are described: hyperemia and damage to the cutaneous capillaries, edema of the dermis and an infiltration of leukocytes, and complete thrombosis of the blood vessels of the subcutaneous tissue and necrosis through the whole depth of the skin. Foremost among the results of exposure to cold and damp are trench foot, chilblains and erythrocyanosis crurum puellarum. Most preexisting cutaneous troubles are aggravated by exposure to cold. This is noticeably true of ichthyosis, psoriasis, most forms of eczema and allergic conditions, and also lupus erythematosus. On the other hand, acne vulgaris tends to improve during the cold weather.

Journal de Chirurgie, Paris

53: 1-160 (Jan.) 1939

- *Spontaneous Hemoperitoneum in Men. H. Mondor and C. Olivier.—p. 1.
Several Failures of Gastro-Enterostomy Treated by Separation of Gastro-Enterostomy and Gastrectomy in One Session. J. Sénéque.—p. 14.
Five Cases of Gastrojejunal Colic Fistulas: Operation in Two Stages; Surgical Technic. G. Lewy.—p. 30.
Case of Fatal Tetanus Following Provoked Abortion Apparently Beginning by Luxation of Jaw. G. Desbionnets.—p. 49.

Spontaneous Hemoperitoneum in Men.—Mondor and Olivier say that for a long time spontaneous hemoperitoneum was regarded as peculiar to women in that it is usually traceable to extra-uterine pregnancy. Spontaneous hemoperitoneum in men was regarded as extremely rare but the authors show that it does not deserve this reputation of extreme rarity. A review of the literature revealed more than 400 cases of spontaneous hemoperitoneum. This number includes those observed in men and those of nongenital origin in women. Classification of these according to their causes reveals that 251 were of splenic origin (rupture of the spleen in malaria, typhoid, recurrent fever, leukemia, tumor, infarct and so on); 122 were of vascular origin (rupture of aneurysm of the splenic artery, rupture of the hepatic artery, of the abdominal aorta, of the vessels of the stomach, of the splenic vein, of the superior mesenteric artery and so on); forty-four were of hepatic origin (rupture of the liver or of a hepatic tumor or aneurysm) and fifteen cases were of obscure origin. The authors show that the clinical diagnosis of spontaneous hemoperitoneum is not impossible if it is thought of. They discuss the symptomatology and the methods of examination that may prove helpful in detecting it but admit that in many instances the discovery of the hemoperitoneum is still a surgical surprise. In this event it is necessary to explore first the splenic region and, if this exploration proves negative, the liver and the other possible sites of the hemorrhage must be investigated. Favorable surgical results are possible, particularly if the blood comes from the spleen or from an artery of the stomach.

Presse Médicale, Paris

47: 121-136 (Jan. 25) 1939

- Animated Bases of Pulmonary Suppurations and Their Spasmogenic and Vasomotor Action. M. Loeper, M. Perrault and J. L. Herrenschildt.—p. 121.
*Use of Sulfanilamide in Urinary Infection with Colon Bacilli. C. J. Gessler and A. Lippens.—p. 124.

Sulfanilamide in Urinary Infection with Colon Bacilli.—Gessler and Lippens report therapeutic experiences with paraminophenylsulfamide in thirty-eight cases of urinary infections with colon bacilli. The patients presented clinical symptoms, not merely colibacilluria. In nineteen of the patients the disorder was acute, in the others it was chronic. The authors give brief clinical histories of each of the patients. In all acute cases the oral administration of the paraminophenylsulfamide produced cure within several days. The fever and the disturbances of micturition often disappeared from the second day of the treatment, whereas the urine became normal again several days later. The authors recommend the administration of 3 Gm. a day during the first forty-eight hours and 2 Gm. daily thereafter for a period of from five to eight days. In one of the nineteen acute cases a relapse occurred which, however, could be readily counteracted by a new series of treatments with sulfanilamide. In some of the patients with chronic urinary infection the disorder had proved refractory to other therapeutic methods, but in only one of them did the urinary infection prove resistant to the sulfanilamide therapy. The dosage in the chronic cases is practically the same as in the acute cases; that is, the patients are given 3 Gm. for two days and then 2 Gm. daily until the urine becomes normal. After that the medication is continued for a few days with 1.5 Gm. In this connection the authors point out that some observers advise interruption of the treatment after two weeks so as to prevent the development of a resistance to the medicament in the micro-organism. Because the efficacy of the sulfanilamide seems to be improved by an alkaline milieu, the authors administer with each dose 0.5 Gm. of sodium bicarbonate; this is the more advisable because the sulfanilamide tends to produce acidosis. The patient

should not drink too much during the treatment, so that the concentration in the urine does not drop too low. The authors conclude that sulfanilamide is highly effective in urinary infections with colon bacilli.

17: 137-152 (Jan. 28) 1939

*Attempt to Treat Arterial Hypertension of Renal Origin by Surgical Vascularization of the Kidney (Nephro-Omentopexy). P. Abrami, M. Iselin and R. Wallich.—p. 137.
Treatment of Burns by Infra-Red Rays. J. Gautier.—p. 139.

Revascularization of Kidney in Arterial Hypertension.

—Abrami and his associates point out that numerous surgical attempts have been proposed to cure or to improve progressive chronic arterial hypertension. This multiplicity of interventions suffices to show their slight value, whether the intervention is a unilateral or a bilateral section of the splanchnic nerves, a unilateral adrenalectomy, a renal decapsulation or an enervation of the renal and adrenal pedicles with or without ablation of the first and second lumbar aorticorenal ganglions. All these techniques, whether employed alone or in combination, produce only temporary and inconstant improvements. After discussing factors that are probably responsible for the failure of these treatments, the authors cite investigators who have proved that renal ischemia plays an important part in the pathogenesis of certain forms of hypertension. This renal ischemia seems to be independent of nervous factors, for it may appear even after enervation of the kidney; that is, the vascular factor is the decisive one. To combat the renal ischemia efficiently, surgical interventions, different from those heretofore employed, seem necessary. A procedure which creates a new vascular plexus in the kidney appears to be the solution for this problem of renal ischemia. The authors point out that the revascularization of an ischemic organ has already been successfully carried out. In this connection they cite the work on the revascularization of the ischemic myocardium carried out by Beck in America and by O'Shaughnessy in England. Heymans and his collaborators in Ghent transferred the experiences made on the heart to the sphere of the kidney. They demonstrated on dogs that by an artificial revascularization, obtained by a renoperitoneal anastomosis, it is possible to counteract the hypertension that is brought on by renal ischemia. The authors resorted to this measure for the first time in two human subjects. They designate their intervention as nephro-omentopexy. They expose the kidney by a lateral transverse incision; they decapsulate it, open the peritoneum and draw a well vascularized portion of the omentum through a window in the posterior parietal peritoneum. They lightly scarify the antero-external surface of the kidney and suture the omentum to it. They report two cases in which they employed this procedure. They gained the impression that the operation had been made too late and that, in order to produce results, nephro-omentopexy must be performed on both sides. However, in spite of failure at the onset, the authors conclude that this method is not only possible in human subjects but easy to perform and not harmful.

Sang, Paris

13: 1-112 (No. 1) 1939

Leukemic Reticulosarcoma. Š. Váradi.—p. 1.
*Employment of Venin of Bothrops Atrox as Hemostatic. C. J. Hanut.—p. 21.
Multiple Myeloma. J. R. Grosgrain.—p. 30.

Venin of Bothrops Atrox as Hemostatic.—Following a review of the literature on the use of venins for hemostatic purposes, Hanut describes his studies with a dry venin of *Bothrops atrox* and with an antibothropic serum prepared with the aid of the venin of *Bothrops jararaca*. On the basis of his studies he reaches the following conclusions: 1. The venin of *Bothrops atrox* can be used in hemophilic subjects either in dilute solutions or mixed with an appropriate dose of antibothropic serum. Under these conditions it is deprived of its coagulating toxicity and it does not produce secondary incoagulability. On the contrary, it preserves a slight coagulating action for at least six hours. It is to be recommended especially before a surgical operation on hemophilic subjects. 2. The venin of *Bothrops atrox* is useless and contraindicated in the majority of hemorrhagic disorders without disturbances of the coagulation, because it is either without effect on the time of bleeding or else it even prolongs it. 3. Because of the thrombinic action of the venin of *Bothrops atrox* in vitro, which transforms the

fibrinogen into fibrin without interfering in the normal mechanism of coagulation, it appears that the employment of the venin of *Bothrops atrox* as a local hemostatic should be given serious consideration.

Rassegna Internazionale di Clinica e Terapia, Naples

22: 45-92 (Jan. 31) 1939

Senile Involution of Appendix and Sclerotic Atresia in Chronic Appendicitis. L. Sauguigno.—p. 47.
Benign Lymphocytic Meningitis: Case. G. Ceruti.—p. 57.
*Venous Septicemia. C. Cantieri.—p. 63.

Venous Septicemia.—According to Cantieri, venous septicemia is a clinical entity which includes not only subacute forms which have been heretofore described but also benign and acute forms. The condition is due to an early selective location of bacteria in the venous system. Phlebitis develops successively at different segments of the veins of the extremities or of the viscera in the course of recurrent attacks of fever and of a pulmonary disease with small foci of pneumonia or bronchopneumonia. The evolution of the condition depends on (1) the intensity of the general infection which causes septicemia, (2) the extension of the vascular lesion, (3) the segment of a vein which is involved (whether peripheral or visceral and superficial or deep) and (4) the intensity of the consequent circulatory disturbances. The condition is restricted to small septic foci and spreads by small foci. Mild forms involve predominantly the veins of the limbs and subside at resolution of phlebitis after two or three recurrences of moderate intensity. Subacute forms may show predominant pulmonary or vascular peripheral symptoms. They follow a long evolution and may be complicated by acute forms. Periphlebitis or thrombophlebitis in periarticular veins is grave. Acute forms are rapidly fatal from the first attack. The most important forms are those of the monoplegic, quadriplegic and phlegmatic types, as well as the type of pulmonary infarct which causes hemoptysis and those which develop with either bronchopneumonia or pleurisy or in the course of pulmonary tuberculosis. The author gives examples of each of the different types. The differential diagnosis of these forms is of importance, as subacute forms can derive benefit from an opportune surgical treatment.

Archivos de Medicina Infantil, Havana

S: 1-82 (Jan., Feb., March) 1939. Partial Index

Treatment of Erysipelas in Infants with Sulfanilamide and Its Derivatives. G. Cardelle y Peniche.—p. 34.
Treatment of Purulent Meningitis with Sulfanilamide. G. García Montes, A. J. Aballi and F. Hernández Calzadilla.—p. 45.
*Treatment of Gonococcal Vulvovaginitis in Little Girls with Sulfanilamide. A. J. Aballi, J. G. Cabrera Calderin and J. M. Labourdette Scull.—p. 64.

Sulfanilamide in Treatment of Vulvovaginitis.—Aballi and his collaborators made a comparative study of the results of sulfanilamide and other different treatments on a group of thirty girls ranging in age from 3 to 9 years who were suffering from gonococcal vulvovaginitis. The infection was at about the same stage of acuteness in all cases. All the patients were hospitalized. Sixteen of the patients were given sulfanilamide orally in three daily fractional doses up to a total daily dose of from 0.6 to 1 Gm. for each 10 pounds (4.5 Kg.) of body weight. The drug was given in series of seven or eight consecutive days followed by periods of rest lasting from three to seven days. The course of treatment consisted of two series and in rare cases three series. No other treatment was given except in one case. The patient was given santonin for intestinal parasitism in the course of the treatment. Acute jaundice followed. Recovery was obtained in twelve of the sixteen cases in an average of twenty-five days. One patient had spontaneous regression six months after failure of the treatment, which failed in three cases. Fourteen patients were given one or several of the following treatments: vaginal antiseptic irrigations, local application of bactericidal substances including fuchsin, vaccines, pyretotherapy or injections of estrogenic substances. Four of the patients recovered in an average of ninety-six days. The treatment was of no benefit to the rest of the patients of the group. The author therefore concludes that sulfanilamide in the proper dosage is of value in the treatment of vulvovaginitis in little girls. The treatment is well tolerated. The administration of any other drug in the course of the treatment is contraindicated. The patients who are going to obtain satisfactory

results show a prompt favorable reaction, which consists in diminution of the clinical symptoms and rapid disappearance of the vaginal discharge. It is advisable to continue the treatment for at least one or two complete series regardless of early satisfactory results. Rest is a factor of importance. Some patients, in the proportion of one to four, do not respond to the treatment. If satisfactory results are not obtained in the course of the first, second or even the third series, the treatment should be discontinued.

Kinderärztliche Praxis, Leipzig

10: 53-100 (Feb.) 1939. Partial Index

- *Characteristic Syndrome of Infection with Influenza Bacilli. II. Kleinschmidt.—p. 53.
Congenital Cystic Bronchiectases During Early Childhood. Matheja and Schäfer.—p. 58.
B₁ Avitaminosis (Beriberi) in Nursling: Case. T. Varga.—p. 63.
Ultron in Treatment of Gonorrhea in Children. O. Ammermann.—p. 66.
Functional Test of Heart and Electrocardiography. P. Laurentius.—p. 69.
Prophylaxis of Rickets in Nurslings. Goebel.—p. 77.

Characteristic Syndrome of Infection with Influenza Bacilli.—Kleinschmidt directs attention to a characteristic syndrome of infection with influenza bacilli, which was first brought to his attention in 1930. The syndrome begins with laryngeal stenosis; then follows a suppurating pericarditis and pleuropneumonia. In one of the cases observed by the author and in two cases that were reported by Baumeier a suppurating meningitis developed. These cases terminated in death. Recently the author observed the aforementioned syndrome in a boy aged 6½ years. In this case, however, the process remained localized; the suppurating meningitis, which is due to bacteremia, did not develop. The syndrome was restricted to laryngeal stenosis, bronchopneumonia, suppurating pericarditis and pleural empyema on the right side. This patient was cured. The author says that he described these cases not in the interest of rare casuistics but rather because the syndrome is characteristic and recurs in an analogous manner. It is caused by a pharyngeal infection with influenza bacilli, which apparently spreads by way of the mediastinum. Exact and systematic bacteriologic tests are essential in this disorder.

Klinische Wochenschrift, Berlin

18: 41-72 (Jan. 14) 1939. Partial Index

- *Influence of Insulin on Glycogen Formation from Dextrose in Normal Animals. C. Brentano.—p. 42.
*Liver and Elimination of Vitamin A in Urine. W. Thiele and S. Seedorf.—p. 51.
Pathologic Physiology of Resected Stomach. F. Brauch.—p. 53.
Anterior Lobe of Hypophysis and Metabolic Function. M. Reiss.—p. 57.
Specificity of Widmark's Method of Determination of Alcohol in Blood. J. Gutschmidt.—p. 58.
Immunobiologic Evaluation of Active Vaccination of Children Against Diphtheria by Alum Toxoid. G. Paschlau.—p. 60.
Gel of Blood Plasma as Culture Medium. R. Bucher.—p. 62.
Increasing Activity of Gonadotropic Substance by Ascorbic Acid. B. Giedosz.—p. 63.

Influence of Insulin on Glycogen Formation.—Brentano says that it was recently observed that the capacity to produce glycogen from dextrose is impaired not only during pancreatic and starvation diabetes but also in all disorders that are accompanied by creatinuria. Thus it was proved that a metabolic disorder heretofore regarded as specific for diabetes mellitus is not always the result of an insulin deficiency. The author decided to investigate whether insulin is capable of improving this impairment in the glycogen formation, even if it is not directly traceable to insulin deficiency. He investigated the glycogen formation in the musculature and liver after rabbits had been starved for twenty-four hours and then had been given 10 Gm. of dextrose for each kilogram of body weight. This quantity of dextrose was divided in half, and in order to insure a better resorption the second half was given two hours after the first half. The dextrose was given either alone or in combination with insulin. The glycogen content was tested five hours after the administration. Summarizing, he says that if 0.5 unit of insulin is administered for each gram of dextrose the glycogen content of the musculature is approximately 38 per cent greater and that of the liver is 20 per cent smaller than if the dextrose is given alone. If the insulin dose is reduced, the difference between the glycogen content of musculature and

liver is much less pronounced. If the quantity of insulin is reduced to 0.01 unit for each gram of dextrose, there is hardly any difference from the exclusive administration of dextrose. In the concentration in which the insulin still exerts an influence on the glycogen formation, it never increases but always decreases the glycogen storage in the liver.

Liver and Elimination of Vitamin A.—Thiele and Seedorf point out that studies on the elimination of vitamin A in the urine have demonstrated that the normal organism does not eliminate this vitamin in the urine and that the diseased organism does this only under certain conditions. After citing investigators who detected vitamin A in the urine of patients with cancer, tuberculosis, general infections, lobar pneumonia, renal disorders and particularly hepatic disturbances, the authors say that, in studies on the causes of the urinary elimination of vitamin A, liver and kidney have always been regarded as having an important part. It cannot be doubted that the liver is important in the vitamin A exchange, for in the healthy as well as in the diseased organism vitamin A is found chiefly in the liver. Although the results of some investigations have directed attention to the importance of the reticulo-endothelial system in the elimination of vitamin A, the authors decided to investigate, on clinical material, under what conditions the impaired liver causes the elimination of vitamin A in the urine and to what extent the elimination of vitamin A can be utilized diagnostically. In the search for a suitable test method they found that the Carr-Price reaction is the most reliable, provided sufficiently large quantities of urine are used. In single tests vitamin A often fails to appear in spite of the fact that there is occasional elimination. Surveying the results of their studies, the authors conclude that the elimination of vitamin A is not pathognomonic for hepatic disturbances as such, for it may occur even in the presence of an intact hepatic function. Thus conclusions regarding the condition of the liver cannot be drawn from the outcome of the vitamin A reaction in the urine. However, the authors point out that experimental studies on animals have directed attention to the reticulo-endothelial system and that their own clinical observations suggest that an impairment of the reticulo-endothelial system might be the cause of the elimination of vitamin A.

Zeitschrift für urologische Chirurgie, Berlin

44: 305-400 (Dec. 12) 1938

- Densely Disseminated Deposits of Calcium Salts in Indurated Scar Tissue in Tuberculosis of Renal Pelvis. J. Račić and B. Gruber.—p. 305.
Manometry of Urinary Bladder (Cystometry). H. Heusser.—p. 312.
Roentgenologic Visualization of Seminal Vesicles in the Living. M. Martini.—p. 326.
*Rehberg's Functional Test of Kidney. G. Klurfeld.—p. 340.
Role of Eosinophil Cells in Diseases of Prostate with Especial Consideration of Its Inflammatory Processes. N. Vondra.—p. 357.
Extravesical Orifice of Ureter. H. U. Gloor.—p. 363.

Rehberg's Functional Test of Kidneys.—Klurfeld directs attention to the functional test of the kidneys that was described by Rehberg in 1926. He reviews the filtration-reabsorption theory on which Rehberg based his functional test of the kidneys. According to this theory the glomeruli extract from the plasma by ultrafiltration a fluid which, with the exception of the plasma proteins, contains all substances in the same quantities as does the blood plasma. In the course of its passage through the tubules this preliminary urine undergoes essential changes which are the result of two functions of the cells of the tubules. 1. The cells of the tubules have an active resorptive capacity for substances that are vitally important for the organism; for instance, chlorides and dextrose. 2. Substances that are of less importance for the organism are diffused through the cells of the tubules. In Rehberg's functional test, creatinine is employed because it has the highest concentration index; that is, it is excreted by the kidneys in maximal quantities and apparently is not reabsorbed. The author shows that by determinations of the creatinine contents of the blood and urine and by measuring the quantity of urine it is possible to compute (1) the index of concentration, (2) the quantity of filtrate from the glomeruli and (3) the quantity of resorbent retained by the tubules. After discussing the technic of Rehberg's test, which is used for theoretical purposes, the author shows that for practical purposes the method can be somewhat simplified. The person whose

renal function is to be tested has to refrain from eating or drinking beginning with the evening of the day preceding the test. At 8 a. m. 2 Gm. of creatinine is given in 500 cc. of water. This comparatively large quantity of water is given in order to maintain an adequate diuresis. At 9 a. m. the bladder is evacuated either spontaneously or by catheterization and a specimen of blood is withdrawn. After another forty minutes has elapsed, the bladder is once more evacuated and blood is again withdrawn from the cubital vein. The quantity of urine is measured in order to determine the filtration per minute. After small quantities of potassium oxalate and of sodium fluoride have been added to both of the blood specimens, they are centrifuged and, of the quantities of plasma thus obtained, equal amounts are combined and mixed and then are examined for the creatinine, urea and sodium chloride content. The author is convinced that with Rehberg's functional test of the kidneys results can be obtained which cannot be realized by other means.

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In memory of Professor V. Bie

Fight Against Diphtheria and Ramon's Vaccination Against Diphtheria. K. Bøjlen.—p. 59.

*Vaccination of 1,000 Student Nurses Against Diphtheria with Investigation of Relation Between Antitoxin Content of Blood and Morbidity. P. Plum.—p. 67.

*Comparative Investigations on Primary Serous Meningitis and Paralytic Poliomyelitis. H. C. A. Lassen.—p. 73.

*Poliomyelitis in Denmark in 1937, with Special Regard to Epidemiologic Relation and Localization of Pareses. H. C. A. Lassen.—p. 80.

*Pfeiffer's Meningitis Treated with Sulfanilamide (Streptomycin). A. Eldahl.—p. 88.

Vaccinia Generalisata. A. Eldahl.—p. 89.

*Eosinophil Leukemia. S. Thomsen and P. Plum.—p. 90.

*Bunnell Reaction in Infectious Mononucleosis. S. Thomsen.—p. 98.

Pneumococcal Endocarditis (Three Cases, Two Localized Exclusively to Tricuspid Valves). H. C. A. Lassen.—p. 99.

Metabolism and Minute Volume in Normal Children and in Children with Diphtheria. P. Plum.—p. 104.

Vaccination of Nurses Against Diphtheria.—Plum says that in this vaccination at Blegdam Hospital the best method proved to be one subcutaneous injection of 1 cc. of purified anatoxin with the addition of 10 volumes per cent of aluminum hydroxide, containing from 35 to 50 precipitation units of anatoxin, followed four, five and six weeks after the injection by the application of five drops of purified anatoxin in each nostril, in all twenty-five precipitation units each time. A local reaction was absent in 8 per cent, slight or moderate in 66 per cent and marked in 26 per cent. A general reaction was absent in 64 per cent, slight or moderate in 20 per cent and marked in 16 per cent. The more antitoxin in the blood before vaccination, the more marked the local and general reactions. Of 603 not vaccinated student nurses, 57 per cent had no diphtheria antitoxin in the blood, 23 per cent had between 0.0005 and 0.10 unit per cubic centimeter and 20 per cent had 0.10 unit or more per cubic centimeter. The antitoxin content of the blood before vaccination was 0.10 unit or more per cubic centimeter in 12 per cent of 160 students; after vaccination the blood contained this amount or more in 91 per cent of the number and more than 1 unit per cubic centimeter in 58 per cent. In the six year period before vaccination was introduced eighty-four student nurses had diphtheria, with a total of 2,698 days of illness; sixteen cases were grave, one of these fatal. In the subsequent six year period, after vaccination, only eighteen cases of diphtheria occurred, with a total of 566 days of illness; four cases were grave but without noteworthy complications. The author considers the antitoxin titer a measure of immunity; in his opinion an antitoxin content in the blood of 0.1 unit per cubic centimeter probably protects against diphtheria.

Primary Serous Meningitis and Paralytic Poliomyelitis.—Lassen finds that endemic clinical paralytic poliomyelitis agrees with endemic primary serous meningitis in the apportionment as to age, sex and the different social classes and most of the symptoms and objective signs before and during hospitalization. While no certain differences between the two groups appear, the endemic cases of poliomyelitis are more seasonal than the primary serous meningitides and have an average higher cell count in the spinal fluid at the clinical start of the disease, with even decrease of the cell count from this time. In the primary serous meningitis the cell count does not reach its maximum until from the seventh to the ninth day. There

is a greater tendency in the paralytic cases to increased albumin globulin and sugar values in the spinal fluid. The majority of primary serous meningitides in Denmark are at present regarded as most probably of poliomyelitic etiology.

Poliomyelitis in Denmark in 1937.—Lassen states that the highest incidence of poliomyelitis to date in Copenhagen was in 1937. The disease was not endemic in the schools. On hundred and twenty-six paralytic cases and sixty cases of primary serous meningitis, believed to be of poliomyelitic origin were treated at Blegdam Hospital. In at least 80 per cent of the patients with pareses the first signs of certain pareses occurred within the first six days of the disease. If after the first indications of paresis there is an interval of two or three days without progression, extension of the paresis is unlikely. About half of the paralytic patients showed symptoms of disorder of the bulbopontile portion of the central nervous system 44 per cent had paralysis of a nerve of the brain, in two thirds of these there was disorder of the facial nerve and in one sixth of the abducent nerve, and about one fourth of the patients had respiratory difficulty. Nineteen of these were treated in the respirator and two with artificial manual respiration. In two fifths of the cases there was complete restitution on discharge or complete restitution later was probable, in one fifth restitution was doubtful and in one fifth it was considered improbable. After examination a year later in the main confirmed the prognosis. One fifth of the paralytic patients died, the highest mortality being in the age group over 20. In eighteen cases death was due to respiratory paresis with complications, in seven to hyperpyrexia or bulbar paresis with respiratory difficulty. In twenty-one cases death occurred before the tenth day. In all the fatal cases bulbar symptoms were more or less prominent. Of the nineteen patients given respirator treatment six survived. The real field for the respirator, the author says, is for patients with spinal respiratory paralysis without bulbar symptoms. Most of the patients who died in the respirator showed increasing cyanosis without definite signs of circulatory insufficiency and in spite of apparently sufficient ventilation. It is suggested that in cases in which swallowing or coughing is impossible the respirator by its inspiration suction aspirates secretion from the upper respiratory passages into the smaller bronchi, thus compromising the arterial oxygen saturation.

Pfeiffer's Meningitis Treated with Sulfanilamide.—Eldahl reports that from 1920 to 1938 there were twenty-eight cases of meningitis due to Pfeiffer's bacillus, all in children, at Blegdam Hospital. In 1920 one patient recovered spontaneously; from 1921 to 1937 the mortality was 100 per cent. Of the four cases in 1938 three were treated with sulfanilamide, with recovery in two of these and transient effect in the third, fatal, case, in which the inflammation was particularly violent.

Eosinophil Leukemia.—Thomsen and Plum consider the case here reported of special interest because of the transition from typical eosinophil leukemia to a pure myeloblast leukemia, which, they say, supports the conception of this symptom complex as a special form of myeloid leukemia, and because of the microscopic establishment in the bone marrow of a cell type not described in the cases previously published. The nucleus is relatively small with sharply defined boundary, the structure close, often vacuolized and without nuclei, the protoplasm colorless or faintly blue, with a peripheral zone containing fine blue-green kernels. In some of the cells there were also eosinophil kernels like those seen in the eosinophil leukocytes in the peripheral blood. The cells in question constituted 40 per cent of the bone marrow cells on the first sternal puncture. The authors are inclined to consider them the parent cells of the abnormal eosinophil cells in the blood. Some eosinophil cells of normal structure were found in the blood and corresponding to them a number of normal eosinophil myelocytes in the bone marrow. The normal eosinophil cells are believed not to be included in the leukemic changes. Several cases of eosinophil leukemia are cited from the literature.

Bunnell Reaction in Infectious Mononucleosis.—Thomsen finds that the Bunnell reaction is a useful aid in the diagnosis of infectious mononucleosis, especially when combined with absorption according to Davidsohn, but that it fails in a not inconsiderable number of cases and a negative reaction therefore does not exclude infectious mononucleosis.

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THE CAUSE OF CHILLS FOLLOWING INTRAVENOUS THERAPY

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In the field of therapy there are at present no more valuable agents than those administered intravenously. Physiologic solution of sodium chloride, dextrose, arsphenamine and countless others are given daily in every hospital in the country. From the time these agents were first introduced, reactions consisting usually of fever and chills have followed their use. The cause of these reactions has been sought assiduously and every possible factor has been suspected. Extensive experiments have been carried out which resulted in the discovery of the cause and the elimination—in the laboratory—of these reactions. These results, unfortunately, have uniformly been published in journals dealing with the preclinical phases of medicine and have escaped the attention of the majority of those using intravenous medications in their daily practice. I believe that these results should be brought to the attention of the therapist, and accordingly I plan to summarize the results of others and to add further proof of a clinical nature to what is already proved in the laboratory.

The factors most generally considered to be the cause of reactions are (1) extremes in the temperature of the solution, (2) the amount of solution, (3) the rate of flow, (4) the concentration of the solution, (5) the glass and tubing used, (6) the p_H and (7) the water used in the preparation of the solution. Countless other possibilities have been mentioned, but those cited are held to be the usual offenders.

The first five of these factors were eliminated as a cause of chills in the following experiment: During the three and one-half month period from Sept. 15, 1935, to Jan. 1, 1936, a record was kept of every venoclysis given in the Hospital Division of the Medical College of Virginia, the record including the temperature of the solution taken by a thermometer at the wrist through which the solution flowed, the amount of solution, the rate of flow, the gage of the needle, the concentration of the solution, and the presence or absence of chill. The tubing used was pure gum rubber prepared by soaking in 4 per cent sodium hydroxide for six hours, then scrubbing and rinsing with green soap and water which was, in addition, passed through the tubing by syringes. The tubing was then boiled for ten minutes

and tap water was run through it for twenty-four hours. Following this, distilled water was run through it three times and finally it was allowed to dry. The flasks used were hard glass thoroughly washed prior to autoclaving.

During this period a total of 680 venoclyses were given with eighty-two chills occurring either during or immediately after administration of the fluid, an incidence of approximately 12 per cent. The results are given in the accompanying table.

From these figures it will be seen that our percentage of chills was reduced from 28 to less than 3 during the period under consideration. Yet no one of the factors mentioned showed a consistent change. The method of preparation of the flasks and tubing had not been changed. Physiologic solution of sodium chloride or 5 per cent, 10 per cent or 15 per cent dextrose in either distilled water or physiologic solution of sodium chloride was still being used. The rates of flow still varied from 250 to 3,000 cc. an hour, the needles ranged from gage 18 to 22 and the temperature varied from 85 to 122 F. Tremendous amounts of fluids given rapidly would produce no chill, yet the following day, under the same conditions and with the same type of fluid, a small amount would cause an intense reaction.

Since there was no consistent change in any of these factors, although the percentage of chills decreased from 28 to less than 3 during this period, and since a careful check of the record of each chill revealed that no one factor or combination of factors was uniformly present when a chill occurred, it appears that they can be ruled out. This does not eliminate entirely the possibility that the glass and tubing used were the cause of occasional chills, since our records did not show which venoclysis set was employed when chills occurred, but it does rule out the possibility that they were the cause of the majority of the reactions.

With regard to the p_H , experiments have been performed on rabbits in which the p_H was varied from 4.6 to 8.0 without any reaction. This work was first done in 1923 by Seibert¹ and was repeated in 1934 by Banks.² It had been previously stated by Williams and Swett³ that saline and dextrose solutions with a p_H of less than 6.5 produced chill and prostration. Our work neither refutes nor confirms this, since the p_H of our solutions was not determined. However, if we accept the rabbit as a suitable experimental animal, there can be no doubt from the work cited that the p_H is not a causative factor. That the rabbit is a suitable animal was shown both by Seibert and by Banks. The rabbit's normal range of temperature is known and also the usual fluctuations caused by environmental changes or by handling. Anaphylactic reactions are difficult to

This work would have been impossible without the active cooperation received from the administrative department of the hospital group of the Medical College of Virginia and from the Department of Physiology, and especially from Mr. George Snyder of the Department of Bacteriology.

1. Seibert, Florence B.: *Am. J. Physiol.* 67: 90-104 (Dec.) 1923.
2. Banks, H. M.: *Am. J. Clin. Path.* 4: 260-291 (May) 1934.
3. Williams, J. R., and Swett, Madeleine: *Hydrogen Ion Concentration Studies*, J. A. M. A. 78: 1024 (April 8) 1922.

produce. In addition, the reaction of chill-producing solutions is constant, consisting of a marked abrupt rise in temperature which usually persists from three to four hours. Unfortunately chills are not produced; but solutions that cause chills in human beings give this

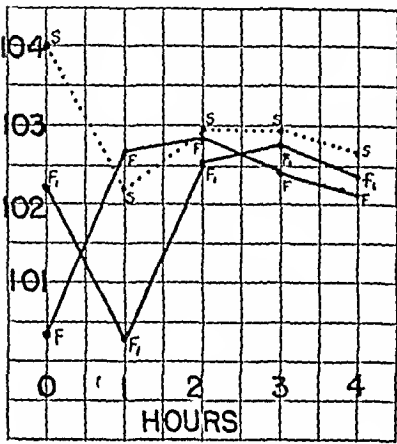


Chart 1.—This is self explanatory. It shows merely that the solutions used are nonreactive and that old saline solution is nonreactive if the proper precautions are taken. It also shows the normal temperature range of the rabbit. F and F₁ indicate fresh physiologic solution of sodium chloride. S indicates the solution 5 days old, autoclaved one hour after distillation.

This narrows the elimination down to the water used in preparing the solutions. During the period in which our percentage of chills was so abruptly reduced, only one factor of all those mentioned was changed. A new still was installed the latter part of October. As the table shows, two weeks later our percentage of chills was 3.3. It can be reasonably inferred that the majority of the chills were caused by distilled water either improperly distilled or contaminated after distillation.

Three and One-Half Month Record of Venoclyses Given in the Hospital Division of the Medical College of Virginia

Date	Venoclyses	Chills	Per Cent
Sept. 16-30	128	36	28.0
Oct. 1-15	121	19	15.0
Oct. 16-31	77	12	16.0
Nov. 1-15	86	8	9.0
Nov. 16-30	119	4	3.3
Dec. 1-15	71	1	1.4
Dec. 16-31	78	2	2.6

In an effort to determine the time of contamination, a series of 120 hypodermoclyses was run. Hypodermoclyses were chosen for several reasons; the type of reaction was familiar, the dextrose factor could be eliminated, reactions were more constant and less awe inspiring than with venoclyses, and the experiments could be readily controlled. Physiologic solution of sodium chloride was used in each instance and two different saline solutions were used, the first being the saline solution ordinarily sent down from the operating room and the second being a special saline solution made from water taken directly from the still, carried to the operating room, filtered, and immediately autoclaved. The method of preparing the ordinary saline solution was as follows: To water taken directly from the still sufficient chemically pure sodium chloride was added to make a physiologic solution. This solution was taken to the operating room and stored in a 5 gallon bottle from which, as needed, it was decanted, filtered into 1,500 cc. flasks and autoclaved. The bottle usually had to be replenished at the end of from forty-eight to seventy-two hours.

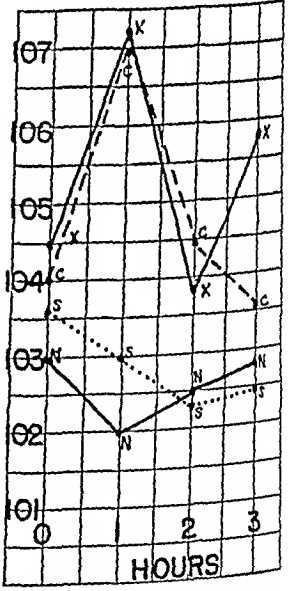
febrile reaction, and solutions giving this febrile reaction produce chills in human beings.

In addition to eliminating the possibility of the p_H as a factor, Seibert at the same time showed that hemolysis, the absorption of atmospheric gases and the preponderance of various ions—potassium, sodium and the like—could be of no importance; the reader is referred to her articles for complete details.

In this experiment 750 cc. of each solution, the special and the ordinary, was given on the lateral aspect of each thigh, the solutions being run in through different sets and with different tubing. The sets were taken at random from the hospital supply and consisted of one 1,000 cc. flask, a length of rubber tubing, an adapter and a needle. No effort was made to keep separate those used for the special saline solution. Twenty-four hours after the hypodermoclysis was administered the thighs were compared both subjectively and objectively. In 93 per cent of the cases the thigh receiving the ordinary saline solution showed a local reaction consisting of tenderness, redness, swelling and local heat, while the opposite thigh showed no reaction other than an occasional slight tenderness. The reactions suggested a severe, acute, superficial infection but in no case was there any formation of pus or any true cellulitis.

From this experiment it becomes apparent that saline solution freshly distilled and autoclaved is nonreactive, while a reactive factor develops in that allowed to stand without autoclaving. That it is not aging of the saline solution alone which produces the factor was proved by the special saline solution being allowed to stand for as long as five days after autoclaving and then being administered without causing a reaction. Supplementary proof is also obtained that the sets are not the cause of reaction, since we had no reactions with the special saline solution although the sets were chosen at random from the hospital supply.

Since immediate autoclaving prevents reactions, it follows that growth of some type must be occurring in and contaminating the ordinary saline solution. Accordingly, cultures were taken from the bottle from the operating room and the following organisms were found: *Escherichia coli* communior, *Bacillus alcaligenes faecalis* and *Monilia albicans*. We had previously considered algae as a possible contaminant, but these were ruled out by the discovery that water from the storage tank of the still was reactive while that taken directly from the still was not. No sunlight, necessary to the growth of algae, reached the storage tank.



It was thought probable that these organisms or their growth products were the cause of the chills and, in order to prove this, experiments were performed on rabbits. The following technique was used: Hundred cc. flasks were carefully washed with tap water, rinsed with freshly distilled water, partially filled with water taken directly from the still, taken to the operating room and autoclaved immediately. These flasks were then seeded with the organisms by removing a loopful of growth from the

Chart 2.—The result of seeding distilled water with reactive organism and allowing growth to occur at room temperature for thirty six hours before autoclaving. One animal is included in which no injection was made, to show the curve produced by handling alone. X indicates *B. alcaligenes faecalis*; S, *Escherichia communior*; N, physiologic solution of sodium chloride, and N, no injection.

agar slant and washing it in the flask. Broth cultures could not be used because of the possibility that the broth itself contained a reactive factor. The flasks were then recapped and allowed to stand at room temperature for periods varying from one to seven days, when they were again autoclaved. Not all the flasks were seeded, some being used for controls. Sufficient chemically pure sodium chloride was added to 10 cc. from each flask to make a physiologic solution and these solutions were injected into the ear veins of rabbits, separate syringes and needles being used for each solution. The temperature of the rabbits was taken at hourly intervals and graphs were made from these readings. A few of the graphs are shown here.

From these graphs and from others not included here it can be seen that on intravenous administration *B. alcaligenes faecalis* always produces fever and that *Monilia albicans* and uncontaminated saline solution never produce fever. It is also shown that the same contaminated water which produces fever in rabbits causes chills and fever in human beings.

Escherichia coli communior was included in only one study, because it was shown in 1911 by Hort and Penfold⁴ that this organism

—*B. coli* at that time—when injected into rabbits produces a febrile reaction. In their paper, one of the earliest on febrile reactions, they also include as reactors *Bacillus typhosus*, *B. pyocyaneus*, *B. subtilis*, *Brucella melitensis*, *Bacillus pestis*, *Micrococcus catarrhalis*, *Staphylococcus albus* and *citreus*, *B. influenzae*, the gonococcus, *Corynebacterium acnes*, the cholera vibrio and mallein. As nonreactors they list *Staphylococcus aureus*, pneumococci, streptococci, *B. diphtheriae*, *B. anthracis*, *B. tetanus* and tubercle bacilli. Seibert⁵ in her later work added many other organisms to both groups. She divided them into four chief divisions: those which cause no reaction, those which cause only a slight elevation of temperature, those which cause a marked elevation of temperature—with this group she produced chills in human beings—and those which cause immediate prostration and death. The last group is quite possibly the cause of the terrific reactions which occasionally follow venoclyses and which are referred to in the literature as "speed shock."⁶ To the already imposing list of reactors Banks added *Pseudomonas scissa* and *Pseudomonas ureae*, chromogenic bacteria common to most water supplies. Banks goes so far as to claim that the *Pseudomonas* organisms are the only producers of reactions as seen in venoclyses, basing his conclusions on the type of temperature curve seen in rabbits. He states that both pathogenic and other nonpathogenic organisms produce reactions, but they are delayed in appearance and with them the animal is much more

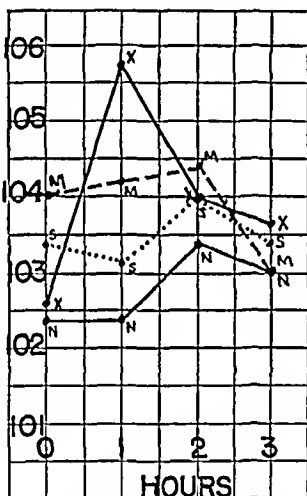


Chart 3.—Showing that a thirty-six hour culture of *Monilia albicans* is nonreactive. X indicates *B. alcaligenes faecalis*; M, *Monilia albicans*; S, physiologic solution of sodium chloride, and N, no injection.

prostrated than with the abrupt rise and fall of temperature seen in reactions produced by water seeded with *Pseudomonas* organisms. It seems to me that there is no necessity to limit these reactions to the activity of one group of organisms, since in our hands *B. alcaligenes faecalis* produces almost identical temperature graphs with those shown in Banks's paper and, in addition, I have shown that this organism will cause chills in human beings. Any organism which is capable of elaborating a pyrogenic substance which thrives at room temperature and which is a common contaminant may be the offender. No organism will ever be the offender if the distilled water is taken directly from the still—most storage tanks are contaminated by backflow of air when the still cools—and autoclaved immediately. Nor will chills occur except in isolated instances, and these not the result of venoclyses.

It may be well at this point to summarize the known characteristics of the reaction-producing substance.

1. The substance is a product of bacterial growth.⁷ It is not due entirely to the bacterial bodies themselves, since filtration through a Berkefeld filter does not render a reactive water nonreactive.⁸

2. It is heat labile. Boiling for six hours will produce a nonreactive water. Autoclaving, if sufficiently prolonged (from three to four hours) will also destroy the factor. The usual period of sterilization however tends to increase its activity.⁸

3. It is water soluble. A nonreactive solution placed in a dry sterile flask which has contained pyrogenic water and which has not been thoroughly washed will become reactive.¹ To digress for a moment, it is for this reason that the tubing and flasks may occasionally

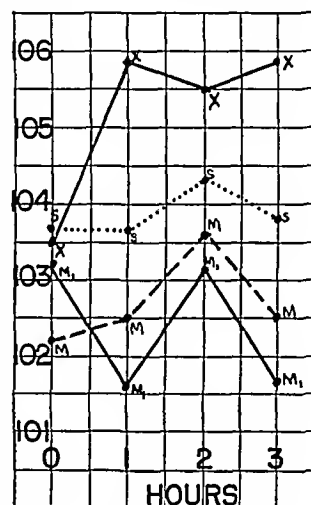


Chart 4.—Showing that a seven day culture of *Monilia albicans* in which the growth was so profuse that the water was turbid is also nonreactive. X indicates *B. alcaligenes faecalis*; M and M₁, *Monilia albicans*, and S, physiologic solution of sodium chloride.

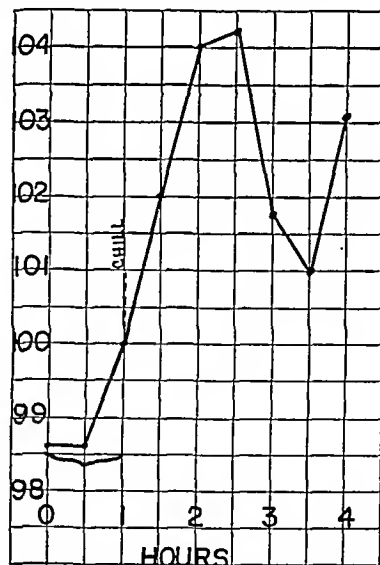


Chart 5.—The temperature of a patient with dementia paralytica who was given a solution of 5 per cent dextrose in distilled water. The dextrose was the 50 cc. ampule of 50 per cent dextrose offered for sale by almost all drug houses. The water was freshly distilled and autoclaved immediately, seeded with *B. alcaligenes faecalis* and allowed to stand at room temperature for twenty-four hours, when it was again autoclaved. Five hundred cc. was used.

4. Hort, E. C., and Penfold, W. J.: *J. Hyg.* 12: 361, 1912.

5. Seibert, Florence B.: *Am. J. Physiol.* 71: 621-631 (Feb.) 1924.

6. Milbert, A. H.: *Am. J. Surg.* 23: 479-485 (Dec.) 1934.

7. Hort, E. C., and Penfold, W. J.: *Proc. Roy. Soc. Med. (Path. Sec.)* 5: 131, 1912. Seibert.¹ Banks.²

8. Seibert.¹ Banks.²

be the cause of reactions, the pyrogenic substance being picked up as the solution passes through the set. If the tubing is prepared according to the method outlined earlier in this paper and any nonreactive water, distilled or otherwise, is passed through it three times prior to immediate autoclaving, this tubing will be non-reactive. Similar care must be exercised in the preparation of the flasks, funnels and storage bottles.

4. The substance is particulate in nature. It is held back by the pores of a 200 second Zsigmondy ultra-filter and passes through those of a 42 second filter.⁹

SUMMARY

Certain factors commonly thought to be influential in producing reactions to venoclysis are eliminated.

Another organism, *B. alealigenes faecalis*, is added to the list of those known to cause reactions. At the same time *Monilia albicans* is eliminated.

Reactions to hypodermoclysis have value as a simple means of determining the presence or absence of pyrogen in the ordinary saline solution used in hospitals.

Further proof is added in support of the already proved statement that reactions to venoclysis are the result of bacterial contamination of the distilled water used in the preparation of the solutions.

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THE FATE OF CHILDREN WITH PRIMARY TUBERCULOSIS

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It was unfortunate that the discovery of the tubercle bacillus occurred during an era in which the causative organisms of so many other diseases and, even more important, so many preventive measures came to light. Thus tuberculosis, as soon as it was found to be due to a bacillus, was relegated to the general category of "infectious diseases." For many of the other infectious diseases, a vaccine or an antitoxin was found within a few years after the causative organism was discovered. Hence the unceasing effort toward finding an antidote or an immunizing substance overwhelmed the minds of the medical scientists from the tuberculin of Koch in 1890 to Calmette's BCG. Tubercle bacilli in various forms, types of products and amounts were tried with varying results.

Naegeli in 1900 found that the majority of people have traces of tuberculous infection in their bodies. Von Behring in 1903 showed that tuberculous infection in childhood is followed by a recrudescence of lesions in adult life. In 1907, with a tuberculin test that was an improvement on Koch's, Pirquet found that tuberculous infection is very prevalent. Subsequent work by other investigators showed that the higher the incidence of infection the higher also are the morbidity and mortality rates for the community, which fact in itself shows that an infection not only is not a protection from tuberculous disease but is a liability.

Much effort and work have been devoted to proving the immunizing property of the tubercle bacillus. It

seems true that this bacillus does produce a certain amount of immunity. It also seems indubitable that primary infection, dormant for a time, can and does give rise to the so-called reinfection type of lesion in later life. Thus Rieh and McCordock showed that

TABLE 1.—Age Distribution

Age, Years	Positive Reactors	Negative Reactors
0-1.....	9	26
1.....	14	32
2.....	26	57
3.....	37	61
4.....	44	61
5.....	55	59
6.....	62	83
7.....	56	84
8.....	46	75
9.....	26	47
10.....	23	52
11.....	18	44
12.....	17	22
13.....	13	23
14.....	14	16
15.....	7	15
16.....	5	3
17.....	2	1
18.....	0	1
19.....	2	0
Total Years	3,122	446
Positive reactors.....	3,122	446
Negative reactors.....	5,091	772
Average Age		7
		6.6

tuberculous meningitis in the majority of cases originated from old foci of infection in or adjacent to the central nervous system. In the prevention of tuberculosis the question, then, is Which of the two factors is more preponderant, the immunity that a tuberculous infection produces or the subsequent hazard from such an infection?

One proposition is universally accepted: Without tubercle bacilli there can be no tuberculosis.

The history of the eradication of bovine tuberculosis is instructive. In one country all obviously diseased cattle were condemned; in another all infected cattle, those with a positive reaction to tuberculin were condemned. In the former country the number of tuber-

TABLE 2.—Length of Follow-Up

Years of Follow-Up	Positive Reactors	Negative Reactors
0-1.....	1	..
1.....	3	..
2.....	2	..
3.....	2	..
4.....	1	..
5.....	1	..
6.....	3	..
7.....	1	..
8.....	3	..
9.....	6	4
10.....	146	241
11.....	94	232
12.....	68	95
13.....	62	36
14.....	30	24
15.....	18	14
16.....	4	3
17.....	1	..
Total Length of Follow-Up, Years	5,024	446
Total Number of Children	5,450	772
Average Length of Follow-Up, Years		11.3
		10.93

culous cattle was not appreciably reduced in ten years, while in the latter it was reduced to one tenth of the original figure.

This communication deals with a ten year follow-up of 446 children with positive reactions to tuberculin and 772 children with negative reactions. These children are from those observed in the first eight years (1921-1928) at the Lymanhurst Health Center, of

9. Co Tui; McCluskey, K. L.; Schmitt, M. H., and Yates, A. L.: *Proc. Soc. Exper. Biol. & Med.* 35: 297-300 (Nov.) 1936.
From the Department of Hygiene and Public Health, Union Medical College, Peiping, China, and the Lymanhurst Health Center, Minneapolis.

whom the total number was just under 6,000. No selection was made. If a patient was followed up for ten years or more he was included. Naturally those in whom tuberculosis developed at any time during the survey were included. Those who came with well developed tuberculosis, in some of whom the condition was proved by later examinations, were excluded; there were twenty-six of these. The majority of the children were either suspected of having tuberculosis or had been in contact with tuberculous patients, living or dead. In most cases the tuberculous patient was removed from the home as soon as was feasible after he was recognized as such. The sanatorium facilities are good in the community. This does not necessarily mean, however, that the contact was severed, as many of the sanatoriums allow their patients out for short intervals and all of them allow visitors over 14 years of age without giving them special care. Some patients refused to go to a sanatorium or remained there for only a short period. The exact amount of exposure is impossible to estimate, but the general impression is that there is no material difference between the two groups.

TABLE 3.—Results of Survey for the Positive Reactors *

	Primary Lesions				Reinfection Lesions				Total
	Lesion Improved or Disappeared	No Change	Calcification in Lungs	Ghon's Lesion	Fibrosis	Pleural Change	Pulmonary	Extra-pulmonary	
Normal.....	157	24	34	1	6	14	2	3	242
Primary lesion.....	2	..	25	8	..	3	..	1	40
Hilar changes.....	9	14	16	10	..	6	..	5	65
Ghon's lesion.....	61	..	..	..	..	13	4	1	78
Fibrosis.....	4	..	..	..	..	2	..	..	6
Pleural effusion.....	..	..	1	..	..	3	..	2	6
Pleural changes.....	4	..	3	..	..	1	..	1	9
Total.....	11	240	49	73	9	6	42	15	446

* Two patients with pleural effusion, one with Ghon's lesion and one with "marked calcification" had negative Pirquet reactions at first, but as their reactions soon became positive and they had such definite x-ray evidence it is considered justifiable to include them in the group with initial positive reactions.

All the tuberculin tests were done by the Pirquet technic except the follow-up tests done since 1930. When a test was recorded as "slightly positive" or the wheal described as one-sixteenth or one thirty-second inch in diameter it was judged by the results of subsequent tests. Early and subsequent roentgenograms were likewise correlated before a definite diagnosis was made.

The age distribution of the children is shown in table 1.

The positive reactors were regularly followed up; for most of them roentgenograms were taken at intervals of six months to a year and, when clinical tuberculosis was suspected, every one or two months. Of the 772 negative reactors 412 were located in a survey by the public health nurses, who saw the child if possible or else obtained information from such reliable persons as the parents, the family physician or the school teacher. The remaining 360 children were examined in the center by tuberculin testing or roentgenograms or both. The length of follow-up is shown in table 2.

The twenty-three positive reactors followed up less than ten years are those in whom the disease developed; of these twenty-one have died and two have been institutionalized or have disappeared. The four negative reactors are in sanatoriums.

COMMENT

It is evident from the figures in the tables that the infected children had roughly nine times the chance of getting clinical tuberculosis within ten years as did the originally noninfected children. With 15 per cent of the children who reacted positively to the tuberculin test and

TABLE 4.—Results of Survey for Negative Reactors *

Case Number	First Examination		Roentgenogram	Year of Last Negative Reaction	Year of First Positive Reaction	Year of Lesion Discovered	Extra-pulmonary Lesion	Pulmonary Lesion	Year Last Seen
	Year	Age							
1	1922	12	Normal	?	?	1929	..	..	1934†
2	1922	4	Normal	?	1926	1927	+	..	1934
3	1922	13	None	1924	?	1932	..	+	1932
4	1922	11	None	?	?	1934	..	+	1934
5	1922	12	Normal	1924	?	1937	..	+	1934
6	1923	7	Normal	?	?	1933	..	+	1933
7	1923	13	Normal	?	?	1934	..	+	1934
8	1924	4	Normal	?	1932	1936	..	+	1935
9	1925	2	Normal	1931	?	1937	..	+	1937
10	1925	7	Normal	?	?	1934	..	+	1934
11	1925	8	Normal	?	1929	1934	..	+	1935
12	1928	9	Normal	?	1933	1934	..	+	1937
13	1928	9	Normal	?	1934	1936	..	+	1937
Total.....							1	11	

* Most of the patients were institutionalized when it was discovered that they had the disease. Patient 8 was given pneumothorax treatment. † Died.

had no other clinical evidence of disease falling ill within approximately the next ten years, it is obvious that a tuberculin reaction in a child is of far more significance than was formerly believed. If the morbidity and mortality rates continue for these children throughout life as they have begun, clinical tuberculosis will be as frequent among them as tertiary syphilis among persons with positive Wassermann reactions. This would seem to be sufficient evidence to dispel any great enthusiasm for immunity produced by the primary tuberculosis complex. Indeed, by the old criteria these are the persons who should have been immunized by reason of infections in childhood. One might maintain that the remaining 85 per cent have been immunized, but any argument in this direction at present would be nothing more than speculation; only time will tell, and since no such observations have previously been made it would be futile to venture an opinion. Suffice it to say that 15 per cent is a large toll to be exacted in so short a time.

TABLE 5.—Summary of Survey

	Total Number of Cases	Reinfection Type of Disease				Total	Per- centage
		Patient Died					
		Pulmo- nary	Extra- pulmo- nary	Pulmo- nary	Extra- pulmo- nary		
Positive reactors	446	42	3	15	7	67	15.02
Negative reactors	772	11	1	1	0	13	1.68

Another useful fact obtained from these observations is that clinical pulmonary tuberculosis rarely appears until adult life. The average age at which these persons were first found to have the primary tuberculosis complex, as manifested by the reaction to tuberculin, was 7 years, but the average age at which they were found to have clinical tuberculosis was 18.9 years. Treatment of children with the primary complex has not been found to afford any more protection against

the clinical type of tuberculosis in adult life than similar treatment would be expected to provide against tertiary syphilis years later for persons with primary syphilis.

As there is no method of destroying tubercle bacilli once foci are set up in the human body, no method of artificial immunization has proved effective, and since years or decades after the initial attack lesions may become communicable, one is forced to use a method of control based on prevention of the initial infection. After all, this is fundamental.

SUMMARY

Four hundred and forty-six children with positive reactions to tuberculin but without clinical pulmonary lesions and 772 children with negative reactions were followed up for ten years. The average age at the first examination for the former was 7 years and for the latter 6.6 years. The average number of years of follow-up for the former was 11.3 and for the latter 10.95. At the end of the follow-up period it was found that sixty-seven of the positive reactors (15.02 per cent) were sick with the reinfection type of disease, while of the negative reactors only thirteen (1.68 per cent) were sick. Thus there were nine cases of tuberculosis in the positive reactors to one in the negative reactors. The ratio between the mortality for the positive reactors and that for negative reactors is 38 to 1.

VITAMIN A DEFICIENCY IN NORMAL AND TUBERCULOUS PERSONS

AS INDICATED BY THE BIOPHOTOMETER

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Löhr's¹ investigations of the wound-healing properties of cod liver oil have stimulated many clinical studies. Of special interest is the work of Banyai,² who successfully treated lupus with topical applications of cod liver oil. In our laboratory the healing effect of cod liver oil applied topically to experimental tuberculous ulcers of the skin of guinea pigs has been demonstrated, and similar favorable results with certain fractions, obtained in the attempt to isolate the active substance, have been reported by Getz.³ Since the fractions most active in the healing of tuberculous lesions are those containing the greatest amounts of vitamin A, the queries arise: Are tuberculous individuals deficient in vitamin A? Will tuberculous human beings respond favorably to increased amounts of vitamin A? Are "normal" persons deficient in vitamin A? To answer these questions, the study here reported was conceived.

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Part of this work was submitted as a thesis for the M.S. degree by Mr. Hildebrand and part as a thesis for the M.D. degree by Dr. Finn.

1. Löhr, Wilhelm: Wundheilung, Leipzig, Johann Ambrosius Barth, 1937.

2. Banyai, Andrew L.: Personal communication to the authors in 1935; Topical Application of Cod Liver Oil in Tuberculosis, *Am. Rev. Tuberc.* 36: 250 (Aug.) 1937.

3. Getz, Horace R.: Cod Liver Oil Therapy in Experimental Tuberculosis, *Proc. Soc. Exper. Biol. & Med.* 38: 543 (May) 1938.

The work of Jeans, Blanchard and Zentmire⁴ and later that of Jeghers⁵ suggested the biophotometer⁶ as a satisfactory instrument for the measurement of vitamin A deficiency, although Palmer and Blumberg⁷ have disputed its value. Our study of several hundred normal persons was done preliminary to testing tuberculous subjects to note any changes when the vitamin A deficient persons were placed on an adequate vitamin A intake and to obtain a basis for comparison.

METHOD

The technic used was similar to that of Jeans.⁴ In all cases the subject was placed in a dark room and allowed to remain ten minutes with the eyes closed before beginning the test. After a reading of the minimum light threshold had been taken, the bright light was turned on for three minutes. The next reading was taken as near as possible to twenty seconds after the bright light was shut off. It was almost never taken as much as thirty seconds after the bright light was extinguished; if so, the time of the reading was recorded. In taking the reading, the rheostat was turned so that the test light was dimmer than that which the subject could see. Then it was turned back slowly to the end point, the point where the center dot in the quincunx was just visible. This technic was rigidly followed throughout the work. Both the reading after the bright light and the curve of regeneration of the visual purple made with the two subsequent readings were used to adjudge the status of the subject. The pathologically deficient group (as defined by Jeans) included those who had a minimum light threshold after the bright light above 1 millifootcandle and subsequent readings that were correspondingly high. The normal group included those who similarly had a minimum light threshold less than 0.6 millifootcandle and the lowest subsequent readings. The group classed as showing borderline deficiency gave readings between those obtained for the normal and the pathologically deficient group.

BIOPHOTOMETRIC RESULTS WITH NORMAL PERSONS

Of the 500 healthy persons tested, 300 were used as controls for comparison with tuberculous patients; 229 were medical students from all four classes and seventy-one were home economics juniors. The rest of the 500 were deemed unsuitable as a control group, since they had requested the test because of a suspected deficiency. The data for the control groups are presented in table 1.

A history was taken of each medical student before the test was made, and the significant data are presented in tables 2 and 3.

4. Jeans, P. C.: Vitamin Deficiency in Childhood, *Minnesota Med.* 16: 688 (Nov.) 1933. Jeans, P. C., and Zentmire, Zelmie: Prevalence of Vitamin A Deficiency Among Children in Iowa, *Am. J. Dis. Child.* 45: 928 (Oct.) 1934; A Clinical Method for Determining Moderate Degrees of Vitamin A Deficiency, *J. A. M. A.* 102: 892 (March 24) 1934. The Prevalence of Vitamin A Deficiency Among Iowa Children, *ibid.* 106: 996 (March 21) 1936. Jeans, P. C.; Blanchard, Evelyn, and Zentmire, Zelmie: Dark Adaptation and Vitamin A, *ibid.* 108: 451 (Feb. 6) 1937.

5. Jeghers, Harold: Night Blindness Due to Vitamin A Deficiency. A Consideration of Its Importance in Traffic Problems, *New England J. Med.* 216: 51 (Jan. 14) 1937; Night Blindness as a Criterion of Vitamin A Deficiency. Review of the Literature with Preliminary Observations of the Degree and Prevalence of Vitamin A Deficiency Among Adults in Both Health and Disease, *Ann. Int. Med.* 10: 1304 (March) 1937. The Degree and Prevalence of Vitamin A Deficiency in Adults with a Note on Its Experimental Production in Human Beings, *J. A. M. A.* 109: 756 (Sept. 4) 1937.

6. Manufactured by the Prober-Faybor Company, Cleveland.

7. Palmer, Carroll E., and Blumberg, Harold: The Use of a Dark Adaptation Technic (Biophotometer) in the Measurement of Vitamin A Deficiency in Children, *Pub. Health Rep.* 52: 1403 (Oct. 8) 1937.

RESULTS OF THERAPY

At first only persons with marked deficiency culled by the instrument were given treatment. Since 20,000 units of vitamin A per day in halibut liver oil⁸ produced little or no change in six persons in two or three weeks, the dose was raised to 90,000 units a day. Some persons showed prompt response to this dose but others

TABLE 1.—Results of Biophotometric Tests of Students

	Pathologically Deficient, %	Borderline Deficient, %	Normal, %
229 Medical Students (November 1937).....	6.55	12.22	81.22
71 Home Economics Juniors (February 1938).....	11.27	15.49	73.21

showed no change; 200,000 units of vitamin A daily in halibut liver oil did, however, initiate a response in fifty of the most deficient subjects in as short a period as two weeks. Usually the patients received this high dose until a favorable response was noted; then the dose was reduced to 100,000 units or less. All patients put on this treatment showed a reduction in their minimum light threshold, and only a few have failed to reach normal limits in two months.

In contrast, the response of five patients with borderline deficiency and two normal persons to 100,000 or more units of vitamin A was more prompt. In three weeks the minimum light threshold for all of these was reduced, and the persons with borderline deficiency had become normal. One of the persons showed, after the exposure to bright light, a reduction in his minimum light threshold from 0.36 to less than 0.05 millifoot-candles. This would indicate that the state of vitamin A nutrition of the biophotometrically normal persons can be improved. That this may be of physiologic significance is suggested by the results of tests done with Dr. R. C. Herrin of the physiology department. Two persons with normal biophotometric readings and one with borderline deficiency were given 100,000 or more units of vitamin A daily in halibut liver oil, and urea clearance was determined before and after several weeks of treatment. Herrin and his associates⁹ have reported that the urea clearance was almost doubled in these cases.

TABLE 2.—Significant Data from Histories of Medical Students at the Time of the Biophotometric Test

	Pathologically Deficient (15), %	Borderline Deficient (28), %	Normal (186), %
Frequent (more than 4 per year) or chronic colds.....	60.0	35.71	21.50
Postnasal drainage.....	53.3	39.29	25.27
Burning eyes.....	26.6	28.56	13.92
Ache.....	6.6	32.14	25.81
Dry skin.....	26.6	14.28	11.29
Early fatigue of eyes with night driving.....	33.3	35.71	16.66

The effect of single massive doses (2,000,000 units) on one normal person and on three with borderline deficiency are given in table 4. All subjects taking the massive doses of halibut liver oil experienced dull headaches but no other untoward symptoms.

All four subjects receiving the halibut liver oil showed a decrease in minimum light threshold, even subject 2

who had values consistently high in the normal range before the test. The peak was reached approximately four and one-half to five hours after consumption of the oil, and the next day the readings were back to the former level. Subject 5 was the same person as subject 4, tested five days later, when his readings had returned to the previous level. The change was so slight with carotene that it could well have been within the limits of normal daily variation, although this subject had never previously shown so large a change in one day.

RESULTS OF BIOPHOTOMETRIC TESTS OF
TUBERCULOUS PERSONS

One hundred and ninety-seven mostly fever-free and ambulatory tuberculous patients, comprising all the persons with minimal disease available for testing and a representative group of those with moderately advanced and far advanced tuberculosis in three sanatoriums¹⁰ in southern Wisconsin were tested during December 1937 and January 1938. Fifty-three per cent were found to be pathologically deficient (table 5). The stage of tuberculous involvement was not known to the biophotometric observer, but later the patients were grouped according to the standards of the National

TABLE 3.—Dietary Habits of Medical Students at the Time of Testing

	Pathologically Deficient (15), %	Borderline Deficient (28), %	Normal (186), %
Eat in restaurants.....	26.6	50.0	45.16
Cook and eat in living quarters.....	26.6	10.71	25.27
Eat in boarding house.....	46.6	39.29	29.57
Eat three complete meals per day....	46.6	39.29	51.61
Eat two complete meals per day....	26.6	39.29	36.02
Eat only one complete meal per day	26.6	21.42	12.37

Tuberculosis Association by the chief resident physician in each sanatorium. The biophotometric results in each group are given in table 6.

RESULTS

It is impossible to tell whether the difference (table 1) between the medical students and the home economics juniors was due to seasonal variation, age, sex or group selection, but seasonal variation seems the most probable since the latter series was tested in February. The medical students were almost all males, and the home economics juniors were all females. The number deficient in each group is higher than one would expect; only 53 per cent of the deficiencies could be explained on a dietary basis.

In comparing the data on the control groups with those for the tuberculous group one notes that 53 per cent of the latter group showed deficiency, as contrasted to 6.5 and 11 per cent of the normal controls. The tuberculous persons were somewhat older than the control subjects (table 5), although none were older than 50 and most of them were between 20 and 35. The number of persons with red hair was too small for the percentages to be of value, but the number of blonds may be sufficient. The fact that the percentage of blonds was twice as high in the deficient group as in the normal group seems important, since it is generally thought that they do not utilize carotene as effectively as do brunets. The favorable results obtained with

8. Supplied by Dr. Warren M. Cox Jr. of Mead Johnson & Co.
9. Herrin, R. C.; Nicholes, H. J., and Siebecker, K. L.: The Influence of Vitamin A upon Renal Clearance in Dog and Man, *Am. J. Physiol.* 123:98 (July) 1938.

10. Muirdale Sanatorium, Wauwatosa, Wis.; Lakeview Sanatorium, Madison, Wis., and Wisconsin State Sanatorium, Statesan, Wis.

heliotherapy may be partly accounted for by selection of subjects to receive the treatment. The very sick persons are not given radiation. The data on subjects treated by pneumothorax are not particularly important but are included to give an indication of the clinical history. The figures on subjects given apicolysis and thoracoplasty imply that the sickest persons are the

TABLE 4.—Effect of Massive Doses of Vitamin A

Subjects 1, 2, 3 and 4 received 50 cc. of halibut liver oil (2,000,000 or more units of vitamin A). Subject 5 (subject 4 retested) took 2,000,000 units of vitamin A as carotene.*
Millifootcandle readings after exposure to the bright light.

Time		Subject Number				
Hours	Minutes	1 (PG)	2 (MA)	3 (WS)	4 (HG)	5 (HG)
0	0	0.85	0.68	0.65	0.57	0.45
1	25	....	....	....	0.39	....
1	45	....	....	....	....	0.53
2	10	....	0.60	....	....	....
3	5	0.39	....	0.538	0.37	....
3	35	....	0.659	....	....	....
4	10	0.327	....	0.48	....	....
4	20	....	....	....	....	0.41
4	40	....	0.679	....	0.26	....
5	15	0.29	....	0.59	0.21	....
5	30	....	....	....	0.26	....
8	0	....	....	....	....	0.37
8	25	....	0.639	....	....	....
9	0	0.327	....	0.53	....	....
17	30	....	....	....	0.56	....
50	0	....	....	....	....	0.76

* Supplied by W. O. Frohling, S. M. A. Corporation, Cleveland.

most deficient, since the milder lesions are not treated by apicolysis and thoracoplasty.

Again, in table 6 the results indicate that the persons with far advanced disease are most apt to be deficient. The increase in percentage of deficiency seems to be parallel with the increase of the tuberculous involvement, except that the frequency in the group with minimal tuberculosis was much higher than in the group with moderately advanced disease. This may be due to the fact that because of the small number, every person with minimal involvement was tested, and we may have tested many that were more intoxicated by their infection than were the persons with moderately advanced disease. The fact that the percentage

TABLE 5.—Results of Biophotometric Tests of 197 Ambulatory Patients from Three Sanatoriums in Southern Wisconsin

	Pathologically Deficient (105)	Borderline Deficient (46)	Normal (46)
Percentage.....	53.2	23.35	23.35
Average age.....	28.4	26.73	25.04
Months of tuberculosis.....	50.5	44.04	50.73
Percentage of females.....	58.05	57.45	43.48
Color of Hair:			
Red.....	1.92%	2.12%	4.34%
Blond.....	15.38%	14.59%	8.69%
Brown and black.....	82.69%	82.97%	86.96%
Color of Skin:			
.....	6.65%	4.26%	25.26%
.....	54.81%	57.45%	43.48%
.....	18.27%	17.02%	10.87%
.....	5.77%	2.12%	0.99%
Thoracoplasty.....			
Apicolysis.....			

of borderline deficiency with minimal tuberculosis is correspondingly low would seem to justify this assumption (table 6). Of particular import is the decrease in the frequency of normal vitamin nutrition as the tuberculous involvement increases.

Whether the tuberculous persons are deficient because of their infection or whether chronic infections develop because they have less vitamin A is still unanswered. One can only imagine what the percentage of deficiency would be in association with very active infec-

tion, for most of the subjects tested were ambulatory, fever free and not confined to "bed rest." The diets of the subjects seemed to contain amounts of vitamin A adequate for healthy persons. Forty per cent received additional vitamin A in fish liver oil although none received more than 30,000 units a day. This amount as a therapeutic dose is insufficient, as judged by our tests on nontuberculous persons. A preliminary study of the response of tuberculous persons to adequate vitamin therapy is under way.

COMMENT

The exact merit and significance of the various methods for determining vitamin A deficiency are still undetermined. Some workers have adapted the original Jeans technic to suit themselves, and others¹¹ have advocated changing the interpretation of the minimum light threshold so that fewer persons would be considered deficient in vitamin A. From our results it is suggested that many in the borderline group might be benefited by therapy. What may be a nonpathologic level of vitamin A nutrition for one person may give rise to symptoms in another, depending on factors not understood at present. We have presented data to show that the minimum light threshold may be lowered

TABLE 6.—Patients Grouped According to Standards of National Tuberculosis Association as to Their Stage of Tuberculosis at the Time of the Test

	Number of Cases	Pathologic Deficiency, %	Borderline Deficiency, %	Normal Level, %
Primary.....	5	37.50	12.50	50.00
Mild.....	26	57.69	3.84	38.46
Moderately advanced.....	102	47.06	28.43	24.51
Far advanced.....	56	60.71	25.00	14.29

even in the so-called normal persons and that such a change affects the basic physiology of the kidney. Just what is the optimum amount of vitamin A for adults is unknown, but it would seem to be much more than has been previously recognized. The amount which was just sufficient to prevent xerophthalmia was once thought to be normal. Since the biophotometer has been developed it is recognized that a subclinical deficiency exists in many so-called normal persons. It is suggested that even normal persons according to the biophotometer might be benefited by more vitamin A. We must think of the optimum amount for the body and not the amount that will just prevent xerophthalmia or just prevent subclinical night blindness.

We have used the Jeans interpretation in spite of the fact that we have presented data to show that the normal level can be changed by intensive vitamin A treatment. The original interpretation must be adhered to in order that results obtained by different workers may be somewhat comparable. The whole curve of regeneration should be used to judge a person deficient and not merely the reading taken immediately after exposure to the bright light, since this reading is the hardest to take accurately.

The evaluation of the method should not be confused by the finding of vitamin A deficiency in what seems to be a perfectly normal person consuming a diet judged to be adequate. That individual differences in absorption, utilization and demand for the vitamin exist should

11. Corlette, Marvin B.; Youmans, John B.; Frank, Helen, and Corlette, Mildred G.: Photometric Studies of Visual Adaptation in Relation to Mild Vitamin A Deficiency in Adults, *Am. J. M. Sc.* 1935; 54 (Jan.) 1938.

be apparent. Furthermore, it is probable that some persons on a large intake of vitamin A may not use it economically and may store comparatively little; when these persons are forced suddenly to live on a diet much lower in vitamin A but adequate for normal persons they show a shift toward the deficient range and then gradually return to a more normal reading. We have noted this in four subjects receiving from 150,000 to 200,000 units of vitamin A daily in halibut liver oil. This agrees with the observations of Davies and Moore,¹² who fed cod liver oil to rats until the livers showed stores of vitamin A which should have been adequate to last them more than a hundred years, but when the animals were put on a vitamin A-free diet the vitamin A content of the liver dropped precipitously.

There is no reason to doubt that the minimum light threshold is intimately related to the state of vitamin A nutrition and can be lowered with vitamin A therapy. That the biophotometer does measure or indicate changes in the state of vitamin A nutrition is also apparent from our data. Some authors have failed to draw similar conclusions because of insufficient dosage and inadequate periods of treatment; others have become confused by the influence of learning factors and daily variations in the subject's response to the test. The poor or slow absorption of carotene may have contributed to the confusion. Our figures with carotene, while for only one subject, agree with those of Clausen¹³ and of Drummond, Bell and Palmer,¹⁴ who concluded that preformed vitamin A is absorbed more rapidly. Even with 200,000 units of vitamin A in halibut liver oil it takes almost two weeks to get a significant therapeutic response in some persons. We have noticed this especially in subjects who had a minimum light threshold above 3.98 millifoot-candles, the limit of our instrument. This immediately suggests the existence of other factors affecting the utilization.

CONCLUSIONS

1. The biophotometer gives an indication of the state of vitamin A nutrition of adults.

2. Normal healthy persons (college students) are not infrequently deficient in vitamin A. Pathologic deficiency on the basis of Jeans's interpretation of the biophotometric readings existed in 6.5 and 11 per cent of two control groups.

3. All persons with a high minimum light threshold adjudged deficient in vitamin A benefited from treatment with halibut liver oil in that their light threshold was lowered.

4. Previously advocated therapeutic doses of vitamin A in halibut liver oil were found grossly inadequate as judged by the response shown by the biophotometer. Larger doses (up to 200,000 units daily) gave a response reasonably prompt in pathologically deficient and very prompt in borderline subjects.

5. In 53 per cent of the tuberculous persons tested there was a deficiency in vitamin A.

6. The vitamin A deficiency paralleled the severity of the tuberculosis.

12. Davies, A. W., and Moore, Thomas: Vitamin A and Carotene: The Elimination of Vitamin A from the Livers of Rats Previously Given Massive Doses of Vitamin A Concentrate, *Biochem. J.* 29: 147, 1935.

13. Clausen, S. W.: Limits of the Anti-Infective Value of Provitamin A (Carotene), *J. A. M. A.* 101: 1384 (Oct. 28) 1933.

14. Drummond, J. C.; Bell, M. E., and Palmer, E. T.: Observations on the Absorption of Carotene and Vitamin A, *Brit. M. J.* 1: 1208 (June 15) 1935.

CONTRACEPTIVE METHODS

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Medical literature records that contraceptive methods have been used since about 2000 B. C.,¹ and evidence is at hand to the effect that even preliterate societies were familiar with such practices. The latter were confined chiefly to abortion and infanticide as a means of birth control, but magic rites were also performed by the medicine men. Primitive peoples also made tampons of roots, seaweed, rags or chopped grass and pills of tannic acid or opium, which they inserted as contraceptives; seed pods were used by them to serve as female condoms.

Among the earliest Egyptian records, notably in the Petri papyrus (1850 B. C.), prescriptions compounded as contraceptive aids contained "crocodile dung and ant paste, and honey." In the Ebers papyrus, prolonged lactation was encouraged for proper spacing, and the first reference to the use of a lint tampon for prevention of conception is to be found. A prescription for acacia tips, honey and lint to be inserted into the vulva is also recorded there.

Coitus interruptus and the use of sponge are referred to in Talmudic writings and in Aristotle's "Historia Animalium" (2 B. C.), the use of oil of cedar, ointment of lead or frankincense commingled with olive oil smeared on the cervix is described. Medicated pessaries of peppermint and honey inserted before coitus and pepper introduced afterward were methods advised by Dioscorides. Soft wool inserted into the cervical canal was one of many methods described by Soranos. Vinegar, one of the most widely used of the present day household remedies, was first mentioned in the literature of the sixth century in connection with astringent preparations such as alum, pomegranate and nutgall for prevention of conception.

Among the Chinese "Complete Collection of Valuable Prescriptions for Women," first published in 1237, quicksilver, gadfly and medicinal leeches taken internally were recommended both for contraception and for the production of abortion. A pill made of quicksilver fried a whole day in oil and taken on an empty stomach was said to result in permanent sterility without incurring bodily injury. A preparation of white lead was given prostitutes each month to suppress the menses and prevent impregnation.

In India a number of methods were used, varying from the practice of coitus obstructus to the drinking of sour rice water on certain days of the month and the precoital insertion of rock salt dipped in oil. There also one finds reference to the postmenstrual fumigation of the vagina with neemwood smoke to prevent pregnancy, and smearing it during menstruation with Palasha seeds mixed with honey and ghu.

Condoms probably had their origin in Japan, and examples of both hard and soft sheaths (tortoise, horn and thin leather) have been preserved to our day. Rubber condoms were introduced in Japan in 1871 after the process of the vulcanization of rubber became known. Women, chiefly prostitutes, inserted bamboo tissue paper tampons or disks of oiled paper into the vagina for contraception.

Islamic methods included along with many medicinal prescriptions for both male and female the practice of

1. Himes, N. E.: Medical History of Contraception, Baltimore, Williams & Wilkins Company, 1936; *J. Contraception* 2: 99 (May) 1937.

coitus interruptus (withdrawal) and also the use of the "safe period." The latter, however, was a reversal in time of the present day theory. The use of suppositories of doe rennet or of elephant dung and honey were also among their methods.

In all sections of the world during the Middle Ages, various magic methods were in practice, but Ilimes

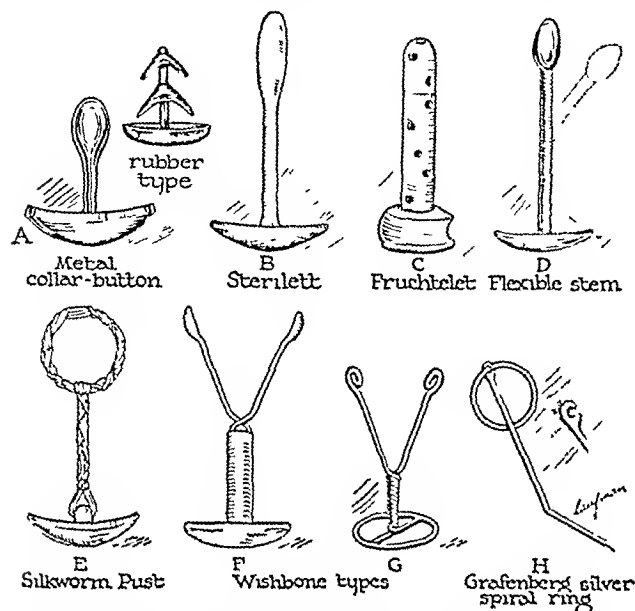


Fig 1—Various types of intracervical and intra-uterine contraceptive devices (adapted from Dickinson and Bryant and modified)

says that their effectiveness was probably very limited. It was a common belief that the seeds of fruitless trees, used medicinally, produced fruitlessness, the analogy being quite obvious.

In England, a year before the epochal essay of Malthus was published (1797), Bentham advised the use of the sponge tampon for contraception in order to reduce the British poor rates.

Many physicians feel that the present interest in contraception is either a temporary wave of reform or a social and economic problem peculiar to the tempo of modern times. But it is obvious from the foregoing that contraception was known and practiced by every race and civilization, from primitive savages who depended on tabus, magic and infanticide, down through the ages to the twentieth century. It now becomes our task to evaluate the methods which have persisted and those which have been evolved in our day. There is a definite need to inform the medical profession of the facts.

In this communication, purely physical methods will be considered. Various types of mechanical contraceptives have been developed. For intra-uterine use there are such devices as stems and rings, and as intracervical contraceptives there are buttons, stems and tubes, and combinations of rings and stems have been employed for many years. In addition, there are cervical caps and cups, vaginal occlusives, such as diaphragms, tampons and sponges, condoms or sheaths of both male and female types, and glans condoms. Some methods of contraception combine the use of some of the physical contrivances mentioned with chemical agents such as jellies, suppositories, tablets, powders and douches. The latter may also be used alone. For the purposes of this contribution, discussion will be limited to those methods which are to be condemned as contraceptives because of their possible harmful effects.

INTRACERVICAL AND INTRA-UTERINE DEVICES

Stem Pessaries.—Intracervical and intra-uterine stem pessaries used for contraceptive purposes claim the advantage of requiring but a single introduction by the physician and may be left for months or years. They are intended for long protection and do not require the cooperation of the patient. They need be removed only in case of bleeding or purulent discharge, pain or fever, and in the event of pregnancy.

The stem pessary had its origin in a device known as a "uterine elevator" (1863) for the correction of retroversion. This pessary was soon replaced, however, by a stem or tube calculated to facilitate conception by straightening the uterine canal and thus aiding the passage of spermatozoa to the fallopian tubes. Subsequently a split spring stem was developed for intra-uterine use in order to discourage implantation of the ovum. These contraptions, according to Dickinson,² while successful in skilled hands, resulted in many infections and in occasional deaths. The vaginal corrective pessary gradually replaced the "elevator" in the treatment of retroversion, and long uterine stems were shortened and modified in an attempt to obviate the inflammatory complications which attended their use.

Stem pessaries are made of heavy metal, such as gold and silver, and also of aluminum alloy, hard rubber, bone and even glass (Baldwin) and are chiefly employed by physicians for the treatment of sterility, dysmenorrhea, acute anteversion of the uterus and hypoplasia.

At first, stems were held in place by means of a vaginal pessary and later were attached to caps or buttons which fitted over the external os. Some stems were split into Y or V shapes so as to be more effectively retained. The types of stems in use are often designated as collar-button, mushroom, butterfly, wish-

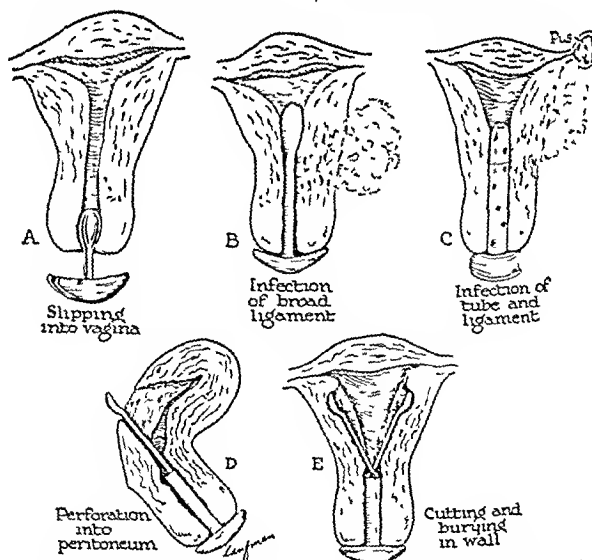


Fig 2—Complications incident to the use of stem pessaries (adapted from Dickinson and Bryant)

bone or Y-shaped stems, and specific instruments were known as the Sterilett, Fruchtelet and the Pust pessary; the latter consists of a ring of silk worm gut twisted into a stem which is attached to a glass button. The various types mentioned are illustrated in figures 1 and 2.

Although the use of the stem pessary has been largely discontinued by the medical profession because of

² Dickinson, R. L., and Bryant, L. K.: *Control of Conception*, Baltimore, Williams & Wilkins Company, 1931.

uterine injury and pelvic infection (7 per cent according to Rawls³), there still appear to be some champions of these devices. Weir,⁴ for example, reported recently a satisfactory experience of more than fifteen years' employment of the stem for the cure of dysmenorrhea. He did not use it as a contraceptive, however, as he believes that there are more satisfactory and less risky methods available. Weir inserted the stem pessary in 318 patients, in 91 per cent of whom the instrument was left for at least six months. While no complication appeared in the majority of cases, twenty-five patients had to have the pessary removed because of bleeding, cramps or both, one because of vaginal irritation and two for apparent pelvic infection. One of his patients became pregnant while wearing the stem and continued satisfactorily for two months after its removal, when abortion occurred after a fall. Kennedy, in discussing Weir's paper, stated that he has discontinued the use of the intra-uterine stems since he was obliged to operate on two patients for tubal infection following the insertion of the stem pessary for dysmenorrhea. Gellhorn⁵ stated that he had used intra-uterine stems in hundreds of cases for relief of obstructive dysmenorrhea and sterility, and also for infantilism, with good results. However, these reports are counterbalanced by an increasing number of histories of serious pelvic infection and quite a few deaths resulting from this practice. Robert Frank⁶ is of the opinion that carcinoma as well as uterine and cervical infection may be traced to the use of these devices and reports that Neugebauer collected reports of six cases in which neglected pessaries caused irritation on which cancer developed. Of course there is no proof that the pessary was the direct cause of the malignant condition.

In my own experience, operation was required in a patient for a unilateral tubo-ovarian abscess which resulted from the use of a Y-shaped silver stem inserted by a physician one year previously as a contraceptive. When bleeding and fever developed, the physician removed the stem. The pelvic inflammatory disease continued and an abscess formed, necessitating surgical intervention.

According to Curtis⁷ the metal cervix pessary causes endometritis and obstruction to drainage, resulting in widespread pelvic infection. He also states that pelvic cellulitis may develop from a lost stem, which frequently works its way upward into the uterus and produces a foreign body infection. Furthermore, stems may perforate the uterine wall or become embedded and so create a pathway for the ascent of bacteria into the uterus. Sussex⁸ reported a case in which hysterectomy was required because of perforation by a gold stem pessary. Cooper,⁹ after discussing the use of various intra-uterine stems and stating their disadvantages, warns that numerous infections and some deaths have been reported. Warner¹⁰ also stresses their dangers.

Pregnancy may occur in the presence of an intra-cervical pessary and, according to Norman Haire,¹¹ if

such a device remains longer than one month it is likely to cause abortion; such abortions are often accompanied by sepsis. He describes a variety of pessaries which are utilized for contraception and particularly condemns the use of the Fruchtelet. All these devices, he says, exert a centrifugal pressure on the uterine walls, which after some time produces necrosis and ulceration. He regards the stem as a dangerous instrument, for he has never seen a case in which its presence was not accompanied by a pathologic condition. Abscess of the uterus and tubes and fatal peritonitis have been observed. In a case in which the "gold pin" had ulcerated through the wall of the uterus, hysterectomy was required.

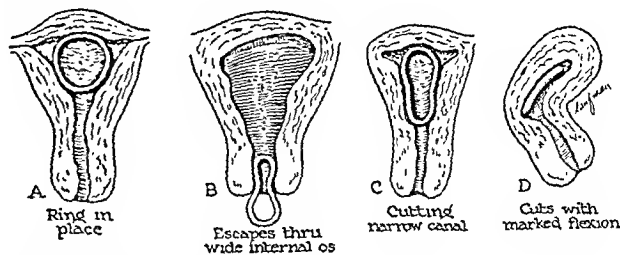


Fig. 3.—Gräfenberg intra-uterine contraceptive ring (adapted from Dickinson and Bryant).

Siddall¹² comments that it is not uncommon for a physician to be called to treat an illness resulting from the use of the intra-uterine pessary. He described a case in which he had difficulty in removing one of these pessaries because the cervical tissue had grown into the openings of the button. The patient was two weeks overdue when severe bleeding associated with high fever occurred. He mentions the cases reported by Rübsmen and Richter and by Royston, who removed pessaries during early pregnancy for like reasons, and states that in Kehler's opinion if a stem pessary is inserted (accidentally?) during early pregnancy and is left for one week it may cause endometritis, resulting in salpingitis, parametritis, pelvic peritonitis and even death.

According to Dickinson and Bryant,² the two types of stem pessary which are chiefly responsible for the inflammatory complications and deaths are the "Sterilett" and the "Fruchtelet." These authorities have collected statistics on the morbidity and mortality incident to the use of such devices and report that, among others, Gummert collected records of ninety-two pregnancies which supervened in spite of the presence of the stem. Abortion occurred in seventy-eight cases, 80 per cent of which were septic; there were thirty-seven cases of peritonitis and seven perforations. They also quote D. P. Smith, who recorded two deaths from general sepsis resulting within two weeks of the insertion of wishbone pessaries by a general practitioner. Reist collected reports of 381 cases in which there were seventeen deaths from general peritonitis or sepsis, eight of which, however, were from stems deliberately inserted to produce abortion. Among the complications noted were nine perforations, forty-four cases of peritonitis and sixty-two septic abortions.

Intra-Uterine Rings.—A type of intra-uterine device, known as the Gräfenberg ring (fig. 3), has been extensively employed abroad for a number of years as a contraceptive. Three types of rings were utilized—a star of silkworm gut, a circle of silkworm gut and, finally, a spiral silver ring. The ring is inserted into

3. Rawls, R. M.: *Am. J. Obst. & Gynec.* 1: 499 (Feb.) 1921.
4. Weir, W. H.: *Am. J. Obst. & Gynec.* 33: 291 (Feb.) 1937.
5. Gellhorn, George: *Gynecological and Obstetrical Monographs*, New York, Appleton-Century Company, Inc. 14, 1931.
6. Frank, Robert: *Gynecological and Obstetrical Monographs* 12: 128, 1931.
7. Curtis, A. H.: *Textbook of Gynecology*, Philadelphia, W. B. Saunders Company, 1930, pp. 52, 293; *Obstetrics and Gynecology*, W. B. Saunders Company 2: 550, 1933.
8. Sussex, L. T.: *Penetration of the Uterus by Gold Stem Pessary*, J. A. M. 100: 1490 (May 13) 1933.
9. Cooper, J. F.: *Technique of Contraception*, Day-Nichols, 1928.
10. Warner, M. P.: *Dangers of Gold Stem Pessaries*, M. Rec. 142: 69 (July 17) 1935.
11. Haire, Norman: *Birth Control Methods*, London, George Allen & Unwin, Ltd., 1936.

12. Siddall, R. S.: *Am. J. Obst. & Gynec.* 8: 76 (July) 1924.

the uterine cavity after dilation of the cervix to number 5 or 6 Hegar, and the presence and location of the ring must be checked up from time to time by means of the uterine sound or by x-ray examination. The occurrence of bleeding or pain necessitates removal of the ring, a procedure more difficult than its introduction. On the other hand, the ring may slip out accidentally and unobserved by the patient, thus entirely defeating its purpose. It may become displaced. In its presence normal pregnancy rarely occurs, but ectopic pregnancy is in no way prevented by the ring.

According to Robert Meyer, who examined the endometrium of fifteen patients who wore the ring one year or longer, no inflammatory change is produced by its presence. Stefko and Lurié¹³ have shown that when pregnancy does occur with the ring in the uterus the embryo may be injured, resulting in deformed children. Leimbach¹⁴ of Copenhagen at first reported favorably on the use of the silver Gräfenberg ring but in 1930 withdrew his endorsement. In 12 per cent of his patients, bleeding and pain required its removal.

Gräfenberg,¹⁵ the originator of the ring, who has used it for many years, had ninety-nine bad results in 1,081 cases, but less in the case of the silver ring than when silkworm gut was used. Thirty-one pregnancies occurred in his series, four of which took place while the ring was in the uterus and twenty-seven after the ring had been lost. Thus failures occur in about 3 per cent of patients. Inflammation occurred in seventeen patients; furthermore, replacements had to be made in 408 cases from one to eight times, a total of 1,390 instances. No mention is made in the literature of malignant conditions resulting from the use of these intra-uterine devices. In cases in which inflammation occurs, one would expect sterility as a sequel.

Green-Armytage¹⁶ reported a case in which pregnancy took place in the presence of the ring, which had been inserted six months previously; the ring became embedded in the chorion, causing pain, discharge and fever. Cregan¹⁷ observed a patient who became pregnant while wearing a Gräfenberg ring; septicemia developed following otitis media, and abortion ensued. Andrews,¹⁸ in an article entitled "Migrating Gräfenberg Ring," was required to perform vaginal hysterotomy when the patient was four months pregnant for removal of the ring, which had become embedded in the wall of the cervix beneath the bladder reflection. Murphy¹⁹ found a Gräfenberg ring in the broad ligament during laparotomy; a normal pregnancy was present at the time. Carleton and Phelps²⁰ experimented with Gräfenberg rings on rabbits and concluded that the devices should be made of gold rather than of silver, since the latter become brittle and are liable to break owing to the slow formation of silver sulfide. They observed no hypertrophy or inflammatory changes in the endometrium due to the presence of the ring but they did note flattening and irregularity in the shape of the cells in the grooves in which the ring lay, accompanied by pressure atrophy of the adjacent glands.

The Gräfenberg ring has not enjoyed extensive popularity in this country, and Dickinson has shown that in order to use such a device intelligently one must first have an accurate picture of the uterine cavity such

as may be obtained by x-ray examination after instillation of iodized oil or other contrast mediums, for there are many variations in size and shape of the uterine cavity in the normal individual.

There are very few justifiable uses for the stem pessary at the present time, one of these being its insertion following cervical amputation, to prevent stricture. In this instance, however, the necessity for its use is limited to but a few weeks. In spite of the satisfactory experiences of Weir, Gellhorn and others, its use for other conditions, such as dysmenorrhea, has been largely discontinued by gynecologists. The use of intra-uterine and intracervical stem pessaries for contraceptive purposes is to be condemned, since it has been shown by the numerous reports quoted that not only do failures occur but serious damage frequently results to the pelvic organs. Cases of endometritis, parametritis, salpingitis, perforation and peritonitis are cited, and even deaths have occurred.

In the case of the intra-uterine ring complications are less likely to occur, but repeated observations are required to ascertain the proper location of the ring, either by means of x-ray examination or by intra-uterine instrumentation. Pregnancy has occurred in its presence and complications have been reported from this source. Bleeding and cramps may require removal, which at times is somewhat difficult owing to the flexibility of the device.

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INTRAVESICAL ROENTGEN THERAPY OF CANCER OF THE URINARY BLADDER

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During the past decade, x-ray therapists in this country have been especially interested in the development of supervoltage roentgen therapy. In Germany, however, where the cost of radium is prohibitive, physicists and radiologists have devoted some attention to the construction of low voltage x-ray machines for therapy in attempts to approximate the same conditions obtained in radium treatment. The superior value of radium as it is generally used in the treatment of cancer cannot be attributed to a more selective action of the gamma rays than of x-rays on cancer cells but rather to the fact that the radium-skin distance is short and that most of the energy is absorbed in the tumor and tumor bed. Radium has given excellent results in the treatment of superficial cancers because of this characteristic distribution of the dose in tissues. The effect obtained from interstitially placed radium element needles or radon seeds in proper dosage has approached the ideal requirement, namely the destruction of all cancer cells with the least destruction of the normal surrounding tissues. With interstitial radium or radon seeds the source of the radiation is in the tumor itself, and because of the inverse square law there is a rapid

From the Josephine Lendrum Tumor Clinic, Paterson General Hospital, Paterson, N. J.

13. Cited by Dickinson and Bryant.²
14. Green-Armytage, V. B.: *Brit. M. J.* 1: 13 (Jan. 2) 1932.
15. Cregan, G. T.: *Brit. M. J.* 1: 237 (Feb. 6) 1932.
16. Andrews, C. J.: *Migrating Gräfenberg Contraception Ring*, *J. A. M. A.* 107: 279 (July 23) 1936.
17. Murphy, Margaret C.: *Lancet* 2: 1369 (Dec. 16) 1933.
18. Carleton, H. M., and Phelps, H. J.: *J. Obst. & Gynaec. Brit. Emp.* 40: 81 (Feb.) 1933.

decline in the effect of the dose, and the surrounding tissues are damaged only slightly. The use of radium, however, involves expense and complicated technic in application and presents some difficulties in the protection of surrounding normal tissues. These disadvantages have stimulated the attempts to find an x-ray

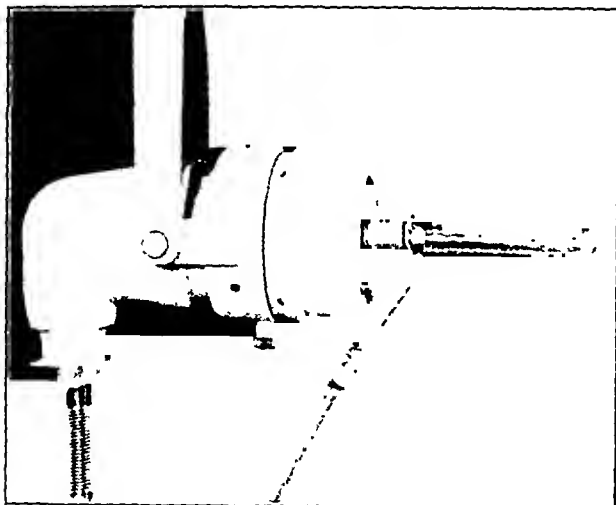


Fig. 1.—Chaoul x-ray tube for low voltage contact or short distance roentgen therapy.

tube which would combine the advantages of radium dose distribution and the economy, efficacy and convenience of the x-rays.

DESCRIPTION OF CHAUL ROENTGEN APPARATUS

Special x-ray tubes furnishing a dose distribution similar to radium were designed many years ago and then abandoned because of technical difficulties concerned with the prevention of shock to the patient. These difficulties were subsequently overcome and the short distance or contact x-ray method was developed.

Schaefer and Witte of Göttingen, Germany, experimented in 1929, using a Lenard tube and cathode rays only; they later added a metal filter over the tube opening which did not permit the emergence of the cathode beam and served as the anode. They were interested in the radiation therapy of gynecologic neoplasms, which are usually situated deeply, so they designed an apparatus operating with 90 to 100 kilovolts and 4 milliamperes. The thin copper filter or transmission anode was plane, planoconcave or planoconvex to modify the shape and focal sharpness of the emergent beam.

Chaoul of the Charité surgical clinic, Berlin, designed an apparatus for low voltage, short distance or contact roentgen therapy. This apparatus is essentially limited to a voltage range of 50 to 60 kilovolts with a filtration of 0.2 mm. of copper. The anode is so placed that the tube operates at contact or at from 3 to 5 cm. target-skin distance. It has applicators or cones of various sizes and shapes to place against the cancers to be treated. These attachable cones are small and can therefore be placed in the various cavities of the body. The Chaoul x-ray machine is necessarily shock proof.

PRINCIPLES OF CONTACT OR SHORT DISTANCE ROENTGEN THERAPY

The short distance or contact x-ray treatments make possible the delivery of doses to the tumor sufficient to disintegrate tumor cells and yet spare the healthy surrounding tumor bed by using small fields sharply local-

ized about the tumor. It furnishes limitation of depth effect by producing a steep energy gradient. The latter is obtained by decreasing the target-skin distance and the voltage delivered to the tube. With this apparatus a soft x-ray beam is utilized, and these rays are absorbed in the superficial tissues. For contact application the dosage rate is approximately 800 roentgens per minute; for a target-skin distance of 3 cm. it is approximately 88 roentgens per minute, and for a target-skin distance of 5 cm. it is approximately 36 roentgens per minute. The intracavitary beam of low voltage x-radiation is restricted to the desired areas with an accuracy that is not possible even with radium. It obviates the necessity of all the unsatisfactory protective devices necessary when radium is used. This apparatus, of course, does not take the place of radium for all types of applications. It has only a specialized usefulness. Chaoul recommends contact therapy for any superficial tumor. The use of this method has been extended to include all tumors that could be made accessible by a surgical procedure.

PRINCIPLES OF INTRAVESICAL ROENTGEN THERAPY (AUTHORS' METHOD)

Heretofore the routine method in the treatment of carcinoma of the bladder has been cystotomy, endotherm excision with a snare of the tumor if it is papillary and interstitial implantation of radon seeds into the base of the cancer. This was followed usually by external high voltage roentgen therapy.

The authors conceived the idea that this scheme of treating bladder carcinomas might be improved on by making the cancer of the bladder accessible not for a short time but over an extended period and by treating the cancer thus exposed by repeated fractionated doses

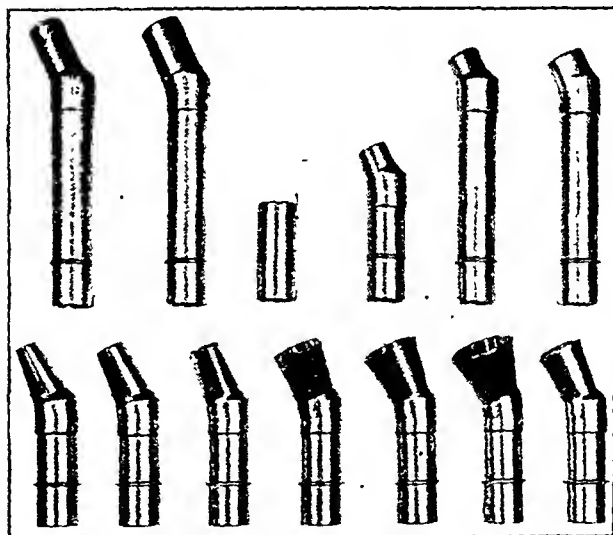


Fig. 2.—Cone attachments showing ports of various sizes and shapes. These cones may be sterilized and placed in position before the x-ray tube is inserted.

of low voltage x-rays applied at short distances. By use of the Chaoul low voltage x-ray outfit, a maximum amount of radiant energy is delivered directly to the cancer with the least amount of injury to the adjacent healthy bladder. This method further obviates the intense reaction and damage to the skin which results from the use of external high voltage x-rays. The method of treatment devised by us consists of (a) marsupialization of the bladder, (b) endotherm excision

of the bulk of the cancer when possible and (c) maintenance of an opening into the bladder so that the low voltage Chaoul tube may be repeatedly inserted against the cancer at the base of the bladder. Our brief experience with this method has convinced us that it has many advantages and no apparent contraindications or disadvantages.

ADVANTAGES OF INTRAVESICAL ROENTGEN THERAPY IN CANCER OF THE BLADDER

The advantages of intravesical roentgen therapy in cancer of the bladder are the following:

1. Ease and accuracy of application.
2. That the dosage delivered is almost the amount of dosage received by the tumor itself, in contradistinction to other methods of irradiation.
3. Sharp limitation of radiation effect to the cancer.
4. Minimum damage to surrounding healthy tissues.
5. That accessibility of the cancer can be maintained for an indefinite time, thereby allowing constant observation of the cancer and the degree of regression, permitting changes in the upper limits of dosage.
6. Freedom from radiation sickness.
7. Quicker and more comfortable convalescence.
8. Reduction of incidence of bladder infection and, because of the exposure, more satisfactory treatment of the infected bladder.

TECHNIC OF MARSUPIALIZATION OF THE URINARY BLADDER

The technic of marsupializing the bladder is as follows: A midline incision, starting about one-half inch above the symphysis pubis and extending for about



Fig. 3.—X-ray tube in position in urinary bladder through a marsupialized cystostomy.

4 inches toward the umbilicus, is made through the skin and fascia. The rectus muscles and fascia are separated in the midline and the bladder, which has previously been distended with water, is approached. The peritoneum is reflected by means of the index finger of the right hand, covered with wet gauze, from

its lowermost attachment up to the highest point possible in the front of the bladder. The peritoneum and prevesical space as well as the sides are covered with moist laparotomy pads and retractors placed over them, giving a good exposure of the bladder. The bladder wall is grasped by two Allis clamps at a point just below the reflected peritoneum. A trocar is then intro-

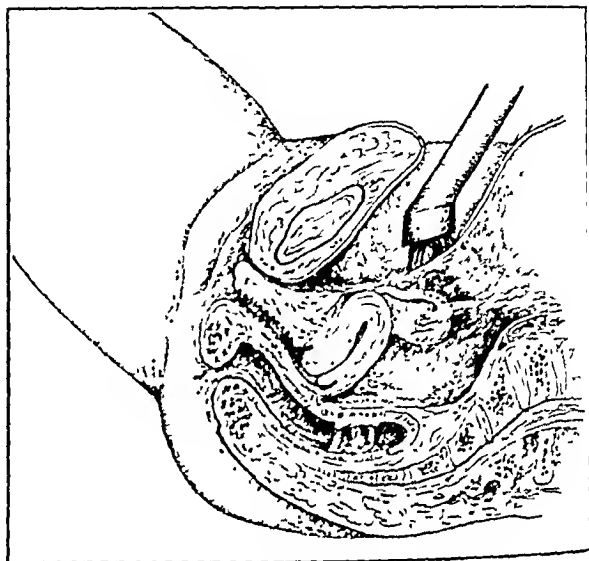


Fig. 4.—Diagrammatic sagittal view of x-ray cone in position

duced into the distended bladder and most of the contained fluid drained. The edges of the opening made by the trocar are now grasped by Allis clamps, which hold the mucosa as well as the muscle. An aspirating tube is then introduced through the cystostomy opening to withdraw the remaining fluid in the bladder. The opening in the bladder is now enlarged downward and wire retractors are inserted so that the interior of the bladder can be well visualized. At this time, if it is possible and the tumor is bulky, it is excised at its base by the cutting current of an endotherm snare. The bleeding is stopped by bipolar endotherm coagulation. The edges of the opening in the bladder are now sewn to the skin and rectus fascia by chromic catgut sutures. A large Marion drain 28 mm. in diameter, about which is wrapped sterile gauze moistened with sterile olive oil, is left in the marsupialized bladder. A thick dressing is then applied to the wound to absorb any excessive moisture. Petrolatum gauze is placed around the wound to protect the skin. The Marion drain is then connected with a rubber tube leading to a sterile bottle attached to the bed.

Four or five days is now allowed to elapse to insure a definite anchoring of the bladder wall to the abdominal wall. The patient is now ready for the intravesical insertion of the Chaoul x-ray tube.

TECHNIC AND DOSAGE OF INTRAVESICAL ROENTGEN THERAPY

The patient is given one-fourth grain (0.015 Gm.) of morphine sulfate one hour before the treatment is begun. For the first few treatments until the wound is well healed this narcosis may be supplemented by small doses of sodium evipal or avertin with amylene hydrate administered rectally. The wound on the abdominal wall is draped, and sterile precautions are taken. The Marion drain is now removed. Sterile gloved fingers are then inserted into the bladder and the cancer is

carefully palpated. A cone is chosen which will adequately cover the entire cancer. The cones to be attached to the Chaoul tube permit a target-skin distance of from 3 to 5 cm.; the selection of one or the other depends on the thickness of the cancer. It should be remembered here that not only the attached cones are within the bladder cavity but also the x-ray tube itself; the roentgen rays in fact are generated in the tube within the bladder at a distance of only 3 to 5 cm. from the cancer. The cone is placed in the desired position and the tube stand is manipulated so that the anode end of the tube can be slipped into the open end of the cone. The treatment is now ready to begin. The optimal fractional doses have not yet been found, but 2,500 roentgens have been given every other day. The bladder is kept open and the cancer is palpated at the time of each treatment in order to determine the degree of regression. It has been found that nine or ten treatments over a period of eighteen or twenty days for a total dosage of 22,500 or 25,000 roentgens has caused satisfactory regression. The total dose will naturally depend on the degree of regression observed.

At the conclusion of the roentgen treatments the marsupialization is maintained for frequent palpation of the bladder wall. When it is definitely decided that sufficient radiation has been delivered to the tumor area and the patient's condition warrants it, a secondary operation is performed for the replacing of the bladder in its normal position and closure of the wound of the abdominal wall.

The technic for this secondary operation is as follows: The marsupialized bladder is separated from the skin and rectus fascia and dropped down into the pelvis. The bladder wound is sewn about a mushroom catheter. The abdominal wall is now repaired as for a hernia. The suprapubic tube is left in the bladder until the patient voids. After the eighth day the suprapubic tube is clamped; after the patient voids for twenty-four hours with the tube clamped, the tube is removed.

REPORT OF ILLUSTRATIVE CASE

A woman aged 67 came to the clinic complaining of hematuria of several weeks' duration. A cystoscopy was done and a specimen for biopsy was obtained. Pathologic examination of the tissue removed revealed epidermoid carcinoma, grade 3. A granular, friable, fungating tumor was found on the left side of the bladder wall near the trigon. It measured about 2 by 2 cm. in diameter. Shortly after cystoscopy the bladder was marsupialized and the fungating bulk of the tumor was removed by an endotherm snare. After adequate anchorage of the bladder wall, intravesical roentgen therapy was begun. The low voltage roentgen treatments were given every other day with a target-skin distance of 3 cm., 0.2 mm. copper filtration, and 60 kilovolts. Twenty-five hundred roentgens was given with each treatment. The time for each of these treatments was twenty-nine minutes. Nine such treatments were administered for a total dosage of 22,500 roentgens. The induration of the bladder wall subsided steadily and at the time of the secondary closure of the bladder, two months after the first operative procedure, no evidence of the tumor could be found. The patient has since been kept under careful supervision and is symptom free except for slight frequency of urination.

SUMMARY

In recent years Schaefer,¹ Witte and Chaoul² have developed efficient shock-proof apparatus for low voltage roentgen therapy which can be given at the relatively short target-skin distances of 3 and 5 cm. or, if

desired, by actual contact of the tumor with the anode or target that transmits the beam. Chaoul has extended the applicability of this method from accessible cancers, e. g. the oral cavity, the skin and cervix uteri, to cancers of the rectum made accessible by surgical procedures. One of us (G. T. P.) conceived the idea of applying this principle to the treatment of carcinomas of the bladder. The principle of marsupialization of the bladder over an extended time to permit fractionated doses of low voltage x-rays to be applied through intravesical cones is new. Although the experience with this method is necessarily limited and the time after treatment is too short to evaluate its curative value, it seems at this time to offer a distinct improvement over the previous methods of treating carcinomas of the bladder.

CEREBRAL COMPLICATIONS FOLLOWING LIGATION OF THE CAROTID ARTERY

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AND

W. H. PRITCHARD, M.D.

CLEVELAND

Ligation of the carotid artery has been used over a considerable period as a therapeutic measure for a variety of serious craniocerebral conditions. Originally it was used as an emergency measure in an effort to control severe hemorrhage following lacerations of the great vessels of the neck and head (Pilcher and Thuss¹). During the middle years of the nineteenth century it was attempted for the purpose of relieving the then incurable cerebral disorders, as for example intense trifacial neuralgia and chronic epilepsy. However, the mortality was high and the permanent residual symptoms of recovered patients serious. Consequently the operation was discarded.

In the past thirty years, with the increasing safety of surgical measures, the procedure has been reintroduced, particularly in the treatment of arteriovenous aneurysms, either anomalous or traumatic (Campbell and Martin,² Gutmann³). In certain instances ligation of the vessels has been carried out for peritonsillar (Greenfield⁴) and nasal hemorrhage. Frequent cranial trauma leads to occasional arteriovenous communication between the external carotid artery and the cavernous sinus, and the resulting pulsating exophthalmos becomes the most common indication for carotid ligation (Kolodny⁵).

The seriousness of carotid ligation was stressed by Pilcher and Thuss, who concluded from their extensive review of the literature that in from 20 to 25 per cent of patients who survive the operation cerebral complications develop. Matas⁶ found but 11 per cent

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A preliminary report of this paper was read before the Cleveland Neurologic Society, Wednesday, March 17, 1937.

1. Pilcher, Cobb, and Thuss, Charles: Cerebral Blood Flow: Cerebral Effects of Occlusion of the Common and Internal Carotid Arteries, *Arch. Surg.* 29: 1024 (Dec.) 1934.

2. Campbell, J. L., and Martin, J. D.: Pulsating Exophthalmos: Treatment by Partial Ligation of Internal Carotid, *J. A. M. A.* 99: 1683 (Nov. 12) 1932.

3. Gutmann, J. H.: Surgical Aspects of Pulsating Exophthalmos, *Internat. J. Med. & Surg.* 48: 259 (July-Aug.) 1935.

4. Greenfield, S. D.: Ligation of the External Carotid Artery for Peritonsillar Hemorrhage, *Laryngoscope* 43: 929 (Nov.) 1932.

5. Kolodny, Anatole: Pulsating Exophthalmos, *Am. J. Ophth.* 15: 327 (April) 1932.

6. Matas, Rudolph, in discussion of Dandy.⁷

1. Schaefer, Walter: *Zentralbl. f. Gynak.* 61: 22-24 (Jan. 2) 1937.

2. Chaoul, Henri: *Strahlentherapie* 53: 202 (June 29) 1935.

showing serious cerebral sequelae. Dandy⁷ urges caution in this procedure with any patient over 30 years of age.

Recently we have had the opportunity of studying the neurologic complications following such ligation, to observe the clinical course and ultimately to examine the brain post mortem. Our data may be of interest.

REPORT OF CASE

History.—K. L., a man aged 37, was admitted to the wards of Lakeside Hospital in November 1936, because of right hemiplegia of three months' duration. In 1924 he had undergone appendectomy for a gangrenous appendix. At that time also he had had several inches of his ileum removed because of tuberculous enteritis.

The present illness occurred abruptly in February 1936 when a profuse nasal hemorrhage from his left nostril developed during shaving. No known cause for the bleeding could be found. Despite intranasal packing and local applications, the bleeding continued. He was hospitalized, and although he received five transfusions in seven days the hemorrhage continued and his condition became critical. When all other measures had failed and the red blood cell count had fallen to 1,300,000, both the external and the internal carotid arteries on the left side were ligated. Two and a half hours after this procedure flaccid right hemiplegia with difficulty of speech and swallowing was noted.

The clinical course thereafter was that of chronic disease. He was unable to use his arm or leg, he could not express himself, and three months later convulsions developed.

Examination.—At the time of his first admission the patient appeared poorly nourished and apathetic looking. The significant abnormalities were entirely neurologic. There was complete right hemiplegia, with marked spasticity, muscular atrophy and hyperactive reflexes and associated confirmatory signs of involvement of the pyramidal tract. Sensory tests revealed diminution in pain, in temperature and in touch, with astereognosis on the right. There was marked aphasia. The blood pressure was 114 systolic and 64 diastolic, and laboratory tests, including a platelet count and determination of bleeding and of clotting time, gave normal results. Spinal puncture revealed normal fluid with an initial pressure of 120 mm. of water and a total protein value of 23 mg. per hundred cubic centimeters. The visual fields showed partial right homonymous hemianopsia, affecting chiefly the lower quadrant.

It was felt that the patient had diffuse left cortical atrophy subsequent to his operation. His treatment was symptomatic, with physical therapy to the affected parts.

He was readmitted to Lakeside Hospital Sept. 13, 1937, because of weakness and loss of weight of four months' duration. He had had no return of function in his extremities, and atrophy of the muscles of the right shoulder girdle had developed. His speech, however, had improved somewhat and his convulsions became less frequent. The physical status on this admission was unchanged, with the exception of observations consistent with general loss of weight. All studies of the blood again gave normal results.

Encephalographic study performed at this admission by Dr. Claude Beck was recorded as follows by Dr. Eugene Freedman: "The roentgenograms show a tremendous dilatation of the left lateral ventricle, which is approximately four or five times normal" (figs. 1 and 2). The diagnosis was marked atrophy of the left side of the cranium.

A battery of intelligence tests were given by our psychologist, Margaret R. Barnes. The results were as follows:

"Arthur point performance scale: chronologic age adult; mental age 8 years; intelligence quotient 53. Achievement Tests: (1) Metropolitan achievement test (primary I, form A grade equivalent): Word picture 2.1, word recognition 1.5, number concept 2.7. (2) Stanford achievement test (advanced examination form A): arithmetic: computation, educational age 9 years 5 months; grade placement 3.6.

"Comments: The Arthur scale rates the patient as having a low moron grade of feeble-minded intelligence. He is handicapped on this test to the extent that some patients speed up their time scores by using both hands. Also he now uses his left hand, whereas he is normally right handed. However he has been using his left hand for about two years and should have reached maximum efficiency by this time.

"The school achievement tests were attempted for some indication of how much of his old learning he had retained. His ability to manipulate verbal concepts is decidedly limited. The word picture test asks that the patient connect the printed word with a picture. This he can do as well as a beginning second grader. The word recognition tests require that the patient pick out from several words very much alike one which is presented orally. This he does as well as a child beginning 1A grade. The third verbal test requires that he underline all the words among several which belong to a given category. He did not fail in this because he did not understand the direction as the trial tests were worked out correctly although with much more difficulty than is ever experienced with the normal first grade child. During the actual test he failed completely. It is interesting to note that with the ascent of probable abstractness of the task the patient failed progressively. The same tendency showed itself in the test of number concepts, although his retention has been better in this than in the verbal field.

"The Stanford achievement test was given first, and it was found that the patient has lost all memory of what the conventional symbols mean. When they were explained, he did computational problems as well as a child beginning 3A grade.

In considering the serious intellectual impairment which this test revealed, it is important to remember that prior to the ligation this patient had been a keen, active, successful business man of at least average intelligence.

Course.—Several months later a serious intestinal ailment developed, characterized by nausea, hiccups and diarrhea. The roentgenograms revealed a granulomatous lesion in the colon proved after resection to be tuberculous. He died on his second postoperative day of this condition, which was independent of the major neurologic disorder.

Postmortem Examination (performed by Dr. C. H. Evans of the Institute of Pathology of Western Reserve University, with neuropathologic study by Dr. A. T. Steegman).—The cause of death as revealed by the autopsy was generalized acute peritonitis, with tuberculous foci in the peritoneum and lungs.

The brain weighed 1,400 Gm. Over the left frontal and parietal lobes an indentation in the cerebral cortex extended 11.5 cm. and averaged 2.5 cm. in width, running parallel and superior to the sylvian fissure and extending anteriorly to a point 3.5 cm. from the median longitudinal fissure. Over the indentation a cystic structure fluctuated with any motion of the organ. Transverse coronal section of the fixed brain (fig. 3) showed the ventricles to be uniformly dilated, but the left lateral ventricle was much larger than the right. An area of necrosis in the distribution of the left external portion of the sylvian artery extended forward almost to the left frontal lobe and involved three frontal convolutions; posteriorly it extended to the occipital lobe. Both white and gray matter were destroyed, but the cystic structure had not ruptured into the lateral ventricles. The temporal lobe was spared. Part of the outer portion of the caudate nucleus had been destroyed with extension to the external capsule. Posteriorly the region of the supramarginal gyrus was involved, with extension to the intermedial lateral aspect of the occipital cortex.

Degeneration of the secondary nerve tract was evidenced by marked reduction of the superior lateral aspect of the thalamus, the left side of the left peduncle and pons, the left inferior portion of the medulla and the right lateral columns of the upper cervical segment of the cord (fig. 4). In the circle of Willis, the left posterior communicating artery was entirely absent. The right posterior communicating artery was less than 1 mm. in diameter. The vertebral arteries were dilated, and a few atheromatous plaques were present over the intima. The lumen of the left internal carotid artery had been obliterated. The stump of the right showed moderate arteriosclerosis (fig. 5).

⁷ Dandy, W. E.: The Treatment of Carotid Cavernous Arteriovenous Aneurysms, *Ann. Surg.* 102:916 (Nov.) 1935.

COMMENT ON THE OUTSTANDING CLINICAL SYMPTOMS

Personality and Mental Status.—According to the available history the patient had previously been a successful, well adjusted business man, well liked socially and loved at home. After the catastrophe he became moody, morose and irritable. Everything in the household upset him; the playing of his children



Fig. 1—Anteroposterior encephalogram showing the tremendous dilatation of the left lateral ventricle, with slight displacement to the left. The picture shows clearly the "hydrocephalus ex vacuo."

disturbed him; situations in the home aroused him to outbursts of anger. On one occasion he made a gesture at suicide. In contrast to the difficult behavior at home, for the most part he smiled cheerfully at the hospital, cooperated well and acted pleased with his environment. He made friends with other patients and took cognizance of the activity in the ward. In the course of the neurologic examination he would observe keenly his reflex responses and the success or failure of various tests. At times he would make a gesture of disgust when he failed in certain performances. More frequently, however, he was inclined to ready laughter and appeared easily amused by certain remarks and procedures.

Though unable to express himself, inner thinking appeared to harmonize with the situation. His mimicry and gestures were consonant with his apparent understanding of success and failure.

This general behavior would indicate a better mental capacity than was revealed by the intelligence tests. It is likely that these tests, which are dependent on verbalization, yielded a result lower than the deportment and conduct would indicate; also it is possible that emotional responses and cooperation may take place even with serious intellectual impairment.

The contrast between the serious personality disorder manifest at home and the apparently winsome personality in the hospital indicates the profound influence of the environment on behavior. It shows also that the deficit in what is expected may decide the behavior response. At home the patient, though an invalid, was still the head of the house; he could see difficulties and problems, or they were brought to his

notice. As head of the house, he was expected to correct and supervise. Unable to perform this function, he would express disgust and explode angrily at the children. Such outbursts were the external evidence of being exasperated with his own helplessness. In the hospital his maximum duty was to take orders and cooperate. As he could perform this duty well, he was looked on as an ideal patient. His ability to perform what was expected evoked self satisfaction and made him a contented patient.

The rather free emotional display referred to as hyperpathy by Schilder⁸ has been ascribed to a lesion in the pathways between the frontal lobe and the supramarginal gyrus.

The serious loss of intelligence revealed by the psychology tests is explained by the total amount of brain tissue damaged plus the fact that the atrophy was in the dominant left hemisphere. As Weisenburg⁹ has pointed out, patients who have had cerebral vascular accidents in the left hemisphere show more intellectual loss than those who have suffered a corresponding lesion in the right hemisphere. Apparently that portion of the brain entrusted with the responsibility of speech control has developed a more important intellectual function.

Many of the symptoms of this patient were similar to those in a case reported by Wortis.¹⁰ However, his patient was confused and disoriented.

The Aphasia.—The most serious handicap which this patient presented was his inability to use language as a tool of thought. He would attempt to express himself in response to a question, but at first he would emit a sound which might be translated as "petee peton—petee, peton." Whatever he had intended to say was expressed only by the constant repetition of the words "petee, peton." The exact meaning of these sounds



Fig. 2.—Lateral encephalogram. The markedly dilated left ventricle can be seen superimposed on the smaller right ventricle.

never came to light. The difficulty was not only with speaking; there was a corresponding inability to read and write; for example, if a simple command was written on a card, such as "raise your hand," he would

8. Schilder, Paul: Localization of the Body Image, A. Research Nerv. & Ment. Dis., Proc. 13: 466, 1932.

9. Weisenburg, T. H.: The Study of Aphasia, Arch. Neurol. & Psychiat. 31: 1 (Jan.) 1934.

10. Wortis, Herman: Ligation of the Common Carotid Artery, Arch. Neurol. & Psychiat. 26: 894 (Oct.) 1936.

glance at the letters, run his fingers across them, smile and perhaps utter his usual "petee, peton" but would not understand the order. He was able to see, and did not show a primary visual defect, for he could recognize familiar objects; for example, if he was shown a picture of a street scene or instructed to point to an automobile, a tree or a child, he would do so promptly,



Fig. 3.—Coronal section of the brain, showing severe atrophy of the left half with compensatory dilatation of the left lateral ventricle. Severe necrosis can be seen in the lower portion of the cortex at the island of Reil.

correctly and with a joyous expression at his successful performance. Writing was markedly restricted. He was able to write only his own name and a few numbers. Although he showed this serious expressive impairment, the receptive side of speech was better preserved. If he was asked a simple question, he would understand it and reply with a gesture of his head. If a written command, such as "raise your hand," was ignored and then spoken, he would respond quickly.

The preservation of the understanding of the spoken word has an anatomic basis, as can be seen in figure 3. The temporal lobe is little affected. The first temporal convolution (Heschl) is the center for the understanding of the spoken word. The intactness of this convolution in our case may be ascribed to the fact that some blood, sufficient to supply the superior temporal convolution, had reached this region by way of the anterior communicating artery to the middle cerebral artery. Also, as pointed out by Davison, Goodhart and Needles,¹¹ the function of the temporal convolution may have been maintained through an adequate collateral blood supply by the anastomotic branch of the posterior cerebral artery. Apparently the blood supply to this region was sufficient. The serious loss of the ability to read (alexia) is ascribed to damage of the angular gyrus. The agraphia was probably due to the general cerebral damage.

It may be interesting to point out that though the patient had marked difficulty in understanding words he seemed to enjoy melodies. His chief activity was to listen to the radio, and he would show by gestures that he enjoyed certain familiar arias.

Another explanation for the striking difference between his ability to understand the spoken word and

his utter failure to comprehend the written word may be on a learning basis. A child learns the meaning of spoken words early, whereas it is not until the age of 6 years or later that he begins to read. Apparently learning to read is a more complex mechanism and requires a more developed cortex than is present at the age of 1 or 2 years. On the basis of the development, it would be logical to expect that certain damage to the brain may cause alexia without producing sensory aphasia. This theory may be appropriate for our problem, though the observation is not uniform in other cases of aphasia. This view is explained in the thesis of Weisenburg¹² "In some patients the relatively simple expressive mechanism or receptive function seemed to be more disturbed than the higher and more complicated aspects of the language process." The problem is as to whether the difference in the understanding of the written and the spoken word is due to a focal or a mass lesion is reflected in the literature on the subject. The opinion was expressed by Orton¹² that the entire brain is concerned in the production of speech, and he discouraged the tendency to exact localization. This concept was well explained by Schilder, who emphasized the view that function may be the result of the total action of the brain, whereas a loss of function may result from a single focal lesion. A homely and simple parallel may be offered in a study of the function of a chain. Obviously the actual pulling power of a chain is dependent on the total action of all the links. Yet the loss of a single link may completely disturb the entire function.

The attempt was made to improve the patient's speech through training, and some progress was made. In the course of months the patient learned to count 1, 2, 3, to pronounce the vowels a, e, i, o, u and to say O. K. However, after having reached this stage in the first six months, he did not achieve further advances. Apparently the amount of brain substance lost could not be compensated for.



Fig. 4.—Section through the brain stem at the level of the aqueduct of Sylvius. Note the marked asymmetry of the cerebral peduncle secondary to the brain lesion.

The Convulsions.—A third serious symptom was epilepsy. The patient had never suffered attacks prior to the ligation but had some six convulsive seizures afterward. As well as one could determine these were generalized, and the patient gave no sign to indicate an aura nor was there a typical sequence, as occurs in jacksonian epilepsy. After treatment was started the patient was given phenobarbital, with a reduction in

11. Davison, Charles; Goodhart, S. P., and Needles, William: Cerebral Localization in Cerebrovascular Disease, *A. Research Nerv. & Ment. Dis.*, Proc. 13: 435, 1932.

12. Orton, S. T.: Some Studies in Language Function, *A. Research Nerv. & Ment. Dis.*, Proc. 13: 614, 1932.

the number of seizures. The occurrence of epilepsy shows that not one focus but a mass lesion may serve as a trigger area for attacks.

MECHANISM RESPONSIBLE FOR THE CEREBRAL SYMPTOMS

The clinical symptoms are the result of a loss of function of the left cerebral hemisphere, particularly the frontal and parietal lobes, with serious damage to the precentral and postcentral gyri. The involved area receives its blood supply from the middle cerebral artery entirely. We may reasonably conclude that a sudden loss of circulation resulted in cerebral anemia and subsequent encephalomalacia.

Dorrance,¹³ in a comprehensive report dealing with ligation of the great vessels of the neck, mentions four possible mechanisms to explain cerebral catastrophes following the procedure:

1. *Anomalies and Variation in the Circle of Willis.*—The occurrence of cerebral anemia from an occlusion of a large vessel raises the question of the integrity of the anastomotic pathways of the circle of Willis. Theoretically one might postulate that, were the collateral blood supply adequate, no such anemia should result. There are many reports in the literature on the frequency of the peculiarities in the makeup of the blood vessel branches that compose this circle. Among 700 cases, Fawcett and Blackford¹⁴ found a complete symmetrical circle in seventy-three, a complete but asymmetrical circle in thirteen and an incomplete circle in four. Windle,¹⁵ among 200 cases, found a complete circle in eighty-three and an incomplete distribution in seventeen. Busse,¹⁶ in the examination of 400 brains, found no instance in which the anterior communicating artery was missing and stated that when the posterior communicating artery was absent it was usually compensated for by other anastomoses. Homans¹⁷ was unable to find in the literature any instance of death following ligation of the carotid artery in which an anomaly of the circle of Willis was present.

Animal experiments tend to show fairly free anastomosis in the brain. Friedemann and Elkeles¹⁸ perfused dye materials through each of four nutrient arteries of the dog's brain while three others were tied and found all parts of the brain uniformly stained. Pilcher and Thuss used differences in arteriovenous oxygen tension to determine the effect of ligation of the great vessels on the cerebral flow of blood in dogs. They found no great differences until both carotid arteries were nearly occluded.

With reference to the intactness of the circle of Willis, it may be stated that the branches are of markedly different size. Whereas there is anatomic continuity between the vessels, the marked angularity and the different caliber of the vessels may be responsible for a reduced flow of blood in certain fractions of the brain; for example, the lumen of the middle cerebral artery appears as a direct continuation of the internal carotid artery. The posterior communicating artery is frequently a narrow vessel joining the middle cerebral

artery at right angles. The amount of blood which could enter the large middle cerebral artery may be inadequate, particularly in a person whose effective blood volume has already been seriously reduced by hemorrhage. The volume which could enter the cortical substance, therefore, by a collateral route may not be sufficient, as the circle of Willis resembles a hexagon of vessels of different caliber.

2. *Thrombosis and Embolism.*—Retrograde thrombosis or embolism from the side of ligation is another possibility which has been mentioned. In certain cases



Fig. 5.—The dissected circle of Willis, showing the obliterated lumen of the left internal carotid artery, the thickening of the right internal carotid artery and particularly the absence of the left posterior communicating artery. The basilar artery is larger than usual (compensation).

a progressive advance of a clot along the occluding vessel may be responsible for anemia of the cortex.

3. *Stimulation of the Cervical Sympathetic Trunks.*—Ligation of the common carotid artery necessarily causes stimulation of the vasoconstrictor fibers accompanying this vessel. The possibility also exists that a sudden vasospasm results in cerebral anemia.

4. *Stimulation of the Carotid Sinus.*—Another contributing factor is the disorder resulting from stimulation of the carotid sinus. This area in the bifurcation of the common carotid artery is extremely sensitive to intravascular pressure. Compression of the sinus or a rise in intravascular tension causes vagal impulses which reflexly may produce slowing of the heart rate, fall in blood pressure or direct sinocerebral impulses leading to a reduction in the cortical flow of blood. Stimulation of the carotid sinus in the normal person often leads to sudden syncope (Weiss and Baker¹⁹).

In our case many factors were present, any one or a combination of which may have contributed to the

13. Dorrance, G. M.: Ligation of the Great Vessels of the Neck. *Ann. Surg.* 99: 721 (May) 1934. (The article contains a comprehensive review of the literature.)

14. Fawcett, E., and Blackford, J. V.: The Circle of Willis, *J. Anat. & Physiol.* 40: 65, 1905-1906.

15. Windle, B. C. A.: On the Arteries Forming the Circle of Willis, *J. Anat. & Physiol.* 22: 289, 1887.

16. Busse, O.: *Virchows Arch. f. path. Anat.* 229: 178, 1921, cited by Dorrance.¹³

17. Homans, J.: Accidents and Precautions in Ligation of the Common Carotid Artery, *Ann. Surg.* 71: 707 (June) 1920.

18. Friedemann, U. S., and Elkeles, A.: Experimental Interruption of Blood Circulation in the Brain, *Klin. Wehnschr.* 10: 2249 (Dec. 5) 1931.

19. Weiss, Soma, and Baker, J. P.: The Carotid Sinus Reflex in Health and Disease, *Medicine* 12: 297 (Sept.) 1933.

serious sequelae of the ligation. These factors include the severe anemia resulting from sustained hemorrhage, the low blood pressure with mild shock prior to operation, the lack of time to perform preoperative compression of the carotid arteries, the absence of the posterior communicating artery on the affected side and the mild arteriosclerosis of the larger cerebral vessels. It is our opinion that the loss of cerebral function resulted from sudden anemia due to tying of the artery, with two causes responsible for the insufficient anastomotic blood supply. The basic defect was structural—the general arteriosclerosis with narrowing of the lumen and the absence of the posterior communicating artery—the contributing physiologic factors were the severe anemia and the low generalized blood pressure.

PRACTICAL SUGGESTIONS

In view of the high immediate mortality and the possibility of serious cerebral complications subsequently, ligation of the carotid arteries constitutes a most hazardous procedure even in the severest forms of nasal hemorrhage. From a neurologic point of view we would emphatically endorse the practice recommended by Johnson and Foster²⁰ and by Strauss,²¹ of ligation of the external carotid artery only. They based their procedure in the control of severe intractable nasal hemorrhages on the fact that the major blood supply to the nose comes only from branches of that artery. The small anterior and posterior ethmoid branches of the ophthalmic vessels and perhaps a few slight twigs perforating the cribriform plate come from the internal carotid artery. Thus, from the theoretical standpoint as well as from the neurologic aspect such a procedure promises best results with a minimum of danger. That this point of view is sound may be inferred from Jackson's²² report of ligation of the external carotid artery in thirty-eight cases, with effective control of hemorrhage and without cerebral complication. In cases of intracranial arteriovenous aneurysm Dorrance and Houdenslager²³ recommended tying of the common carotid artery as a better procedure than ligating the internal. They pointed out that there ultimately may be a collateral supply from the external carotid artery.

CONCLUSIONS

Following ligation of the left external and internal carotid arteries the major symptoms were hemiplegia, hemianesthesia, aphasia, convulsions and impairment of intelligence. The anatomic basis for the symptoms was marked atrophy of the left hemisphere, particularly in the parietal areas and the structures supplied by the middle cerebral artery. For the physiopathologic basis of the cerebral lesion several factors were found, including arteriosclerosis, absence of the posterior communicating artery and severe general anemia prior to ligation.

This case offers strong support to the practical suggestion that in cases of intractable nasal hemorrhage otherwise uncontrollable only the external carotid artery be ligated.

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20. Johnson, M. C., and Foster, M. E.: Ligation of the External Carotid Artery for Traumatic Nasal Hemorrhage, *Ann. Otol., Rhin. & Laryng.* 42: 588 (June) 1933.

21. Strauss, Abraham: Epistaxis in Pregnancy Requiring Ligation of the External Carotid: Review and Case Report, *Ann. Otol., Rhin. & Laryng.* 42: 230 (March) 1933.

22. Jackson, Chevalier, cited by Strauss²¹

23. Dorrance, G. M., and Houdenslager, P. E.: The Physiological Considerations in the Treatment of Pulsating Exophthalmos, *Am. J. Ophth.* 17: 1099 (Dec.) 1934

THE CEMENT BURN

ITS ETIOLOGY, PATHOLOGY AND TREATMENT

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AND

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In the past few years the importance of the subject of cement burn has again been forcibly brought to attention as a result of the vast building enterprises that have been undertaken.

In projects that involve the use of large quantities of concrete the medical profession, the employer and the employee are constantly confronted with the problem of the cement or concrete burn.

The lesion is an important one because of the economic loss to the employer and the employee. The literature contains but meager information concerning this type of burn. This is true not only as to its etiology and pathology but likewise as to its treatment, which in some instances is predicated on hazy or even erroneous fundamental chemical principles.

The composition of Portland cement and of concrete is shown in table 1.

It is shown that, in these percentage compositions of cement and concrete, calcium oxide or lime forms by far the major portion of cement, and it is this substance with which we are primarily concerned. When cement is mixed with sand, gravel and water to form concrete, the alkaline reaction is diluted only by the bulk of the other relatively inert substances. As determined colori-

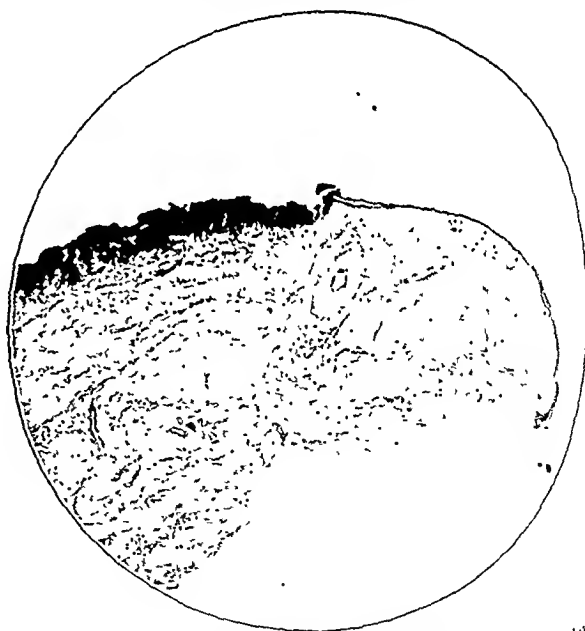


Fig. 1.—Human skin twelve hours after exposure to cement. Slightly reduced from a photomicrograph with a magnification of 7 diameter.

metrically,¹ the p_H of these samples of cement in solution varies between 11.5 and 12, which is well on the alkaline side.

PATHOLOGIC CHANGES

In general, in the action of corrosives² destruction of tissue is preceded by an inflammatory reaction. Pathologically, chemical cauterization shows three distinct

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1. Determinations were made by Maurice Tainter, Department of Pharmacology, Stanford University School of Medicine.

2. Sollmann, Torald: A Manual of Pharmacology, ed. 4, Philadelphia W. B. Saunders Company, 1932, pp. 186-187.

areas: (1) an area of inflammation and hyperemia at the periphery and in the depth of the involved tissue; (2) a layer of necrosis which follows the inflammatory action; (3) a layer, in which the chemical canterization results in a solution of the cells already killed by the inflammatory process. These three—hyperemia,



Fig. 2.—Human skin twelve hours after exposure to cement. Slightly reduced from a photomicrograph with a magnification of 80 diameters.

inflammatory necrosis and chemical solution—are to be considered as successive stages of the same action.

A scab is formed after corrosion by the coagulation of the inflammatory exudate and by the chemical products (mostly albuminates) resulting from the interaction of the corrosive agent with this exudate and with killed cells. Alkaline corrosives combine with the tissues to form chiefly alkaline albuminates or with fats to form soaps and in this way produce tissue destruction. These corrosives are very hygroscopic and withdraw water from the cells. This further contributes to the necrosis.

Peculiar to alkalis the scab formed is soft, since the resulting compounds are soluble and thus the chemical readily further penetrates into the tissues, spreading and extending deeply.

In the case of cement we are dealing with five definite factors in the production of the burn:

1. Abrasive action of the concrete.
2. Friction made by wearing apparel and the rubbing of contiguous anatomic parts.
3. Heat of solution while slaking, which, however, is a minor factor.
4. The hygroscopic action of lime with its consequent cellular destruction.
5. Its corrosive action as an alkali. Since the alkaline albuminates are soluble in the alkalis, they are redissolved and reprecipitated so that destruction continues until the alkali is dissipated. In contradistinction, acid burns are practically self limiting, since the acid albuminates formed are insoluble in acids.

The pathologic picture of the cement or concrete burn is clearly shown in the accompanying illustrations. These biopsies were made at intervals of approximately twelve, forty-eight and seventy-two hours after the patient had been burned with concrete.

In figure 1, twelve hours after exposure to concrete, one sees a loss of epithelium down to the corium with some edema of the subcutaneous fibrous tissue. A portion of normal skin is also shown.

Figure 2, a higher magnification of figure 1, shows the marked cellular infiltration about a sweat gland. Note the extent of the subcutaneous edema even after

TABLE 1.—Definitions or Composition of Portland Cement and of Concrete

Portland cement:	
Silica (SiO_2)	22 %
Alumina (Al_2O_3)	7½ %
Iron oxide (Fe_2O_3)	2½ %
Lime (CaO)	62 %
Magnesia (MgO)	2½ %
Sulfur trioxide	1½ %
Loss on ignition	2 %
Concrete (all proportions are by weight):	
Sand	29 %
Gravel	55 %
Water	8 %
Cement	8 %

so short a time. There is one area of round cells around a hair follicle, but most of the infiltration follows along the sweat glands to their bases.

The epithelium, which has been destroyed down to the corium, has been replaced by a pseudodiphtheritic membrane in which are found inclusions of amorphous substances, supposedly calcium.

Figure 3 is a still higher magnification of figure 1, showing the necrotic pseudomembrane with amorphous

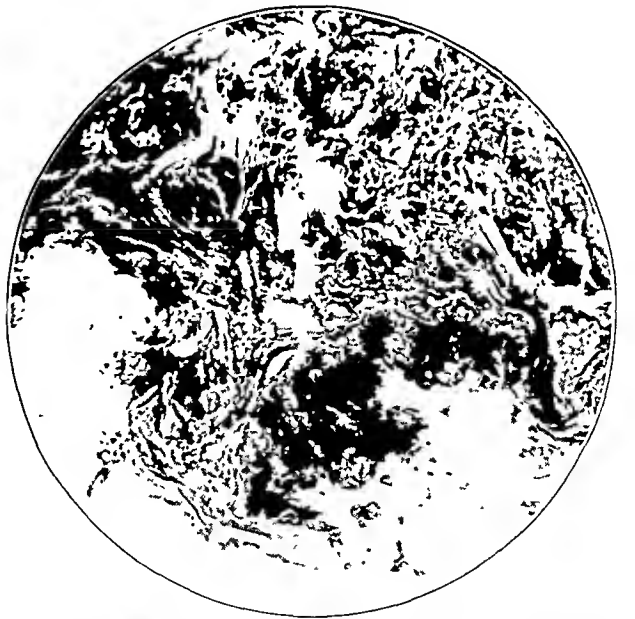


Fig. 3.—Human skin twelve hours after exposure to cement. Slightly reduced from a photomicrograph with a magnification of 450 diameters.

material on the surface and needle-like crystals extending into the necrotic tissue.

Figure 4 shows the formation of a bleb beneath the pseudodiphtheritic membrane, approximately two days after exposure to concrete. The necrosis is extending deeper into the corium and there is a small abscess about a sweat gland.

Figure 5 shows the effect of concrete on human skin three days after exposure. Note how the necrosis has spread so that it now extends into the subcutaneous tissue. The black isolated and conglomerate areas to

the left are calcium deposits. Note the depth at which these lie and the halos of necrosis about them. To the right the calcium deposits with their areas of necrosis can be seen extending into the subcutaneous tissues.

Figure 6 is a higher magnification of a portion of figure 5, showing these amorphous calcium deposits surrounded by necrosing round cell infiltration. We



Fig. 4.—Human skin two days after exposure to cement. Slightly reduced from a photomicrograph with a magnification of 15 diameters.

believe from their location and configuration that these deposits are probably in the sweat glands.

Figure 7 is an oil immersion view of the calcium deposits deep in the tissues.

ANALYSIS OF CASES

In a period of approximately a year and a half sixty cement burns have come under our care. These cases are analyzed in table 2.

It is seen that a relatively long interval elapses between the onset of symptoms and the time of application for medical treatment. The symptom that eventually brings patients with this condition to the doctor's office is pain. This latent period in the manifestation of pain is typical of burns even from concentrated alkalis. Once the caustic action has begun, the persistence of pain is likewise typical of these burns.

The usual site of such cement burns is the dorsum of the feet, the malleoli, the popliteal spaces, the wrists, the hands and the contiguous surfaces of the fingers. Since cement workers usually wear high boots and gloves, such burns occur most frequently at the sites of friction, proving that the abrasive action of the concrete is by no means a negligible factor in the production of the lime burn.

Attention is called to the relatively high incidence of infections (20 per cent) complicating cement burns. The time that elapses between the onset of symptoms and the application for treatment apparently plays no part in deciding ultimately whether infection will take place or not.

It is a well known fact that a common cause of disability among cement workers is furunculosis, far outranking all the other disabling cutaneous diseases in

this industry. Such infections are caused primarily by a clogging of the sweat glands with lime. Dust, body debris and bacteria are then rubbed into the sweat glands, secondarily producing an infection. An ideal culture medium for such bacteria located deep within the sweat glands is furnished by the products resulting from the corrosive action.

As a result of the warmth furnished by the bandaging of such burned areas and as a result of the sweating that takes place beneath these bandages, it is not unusual to have furuncles develop in neighboring hair

TABLE 2.—Analysis of Sixty Cases

Number of cases.....	60
Average interval between onset of symptoms and application for medical treatment (longest interval 7 days, shortest 8 hours).....	3 days
Disability.....	642 days
Average per case.....	10 days
Treatment period.....	857 days
Average per case.....	14 days
Number of cases requiring hospitalization.....	7
Average stay in hospital per case.....	8 days
Percentage of total cases requiring hospitalization....	11
Number hospitalized due to infection.....	6
Number of cases infected.....	13
Percentage of total cases infected.....	20

follicles while the patient is under treatment. Particularly is this true when the bandage is held in place by the ill advised use of adhesive plaster against the skin in the dressing of such wounds.

TREATMENT

Such burns are preventable, but it is difficult to preach prophylaxis to employers other than on a dollars



Fig. 5.—Human skin three days after exposure to cement. Slightly reduced from a photomicrograph with a magnification of 15 diameters.

and cents basis. The sixty cement burns that we have treated in the past year and a half involved a total loss of time of 642 working days with an average disability of ten days per case. The average total cost per case approximated \$50.

Smearing of the parts most frequently exposed with petrolatum has been shown by experience to be somewhat unpractical though effective. It is especially effective when the dry cement is being handled. Clean

dry boots and gloves, frequently changed, reduce considerably the morbidity caused by these lesions.

The installation of showers and compulsory bathing by men coming off a shift would be most desirable. Such lavage would abort many of the cases entirely, and in those cases in which corrosion has already started it would greatly decrease the depth and extent

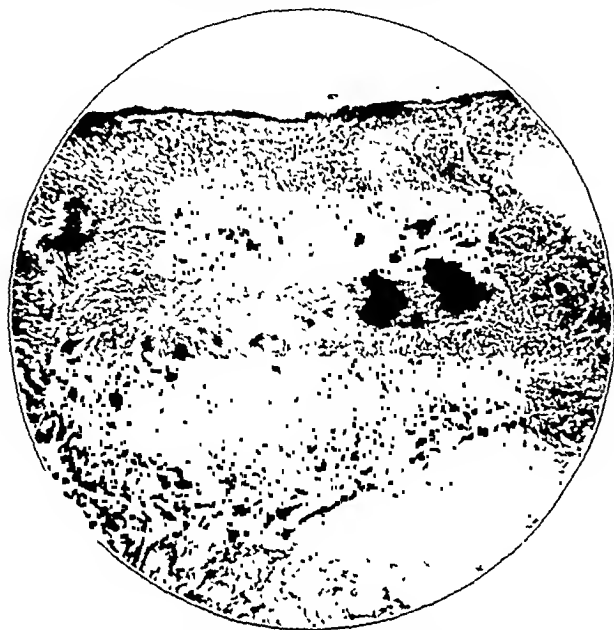


Fig. 6.—Human skin three days after exposure to cement. Slightly reduced from a photomicrograph with a magnification of 80 diameters

of the burn and probably call the lesion immediately to the patient's attention.

After the symptoms have begun to manifest themselves one would imagine the ideal immediate treatment to be the chemical neutralization of the offending agent. Ample proof to the contrary is furnished by the experimental work of Davidson.³

One lower extremity of a group of rats was exposed to both strong acids and strong alkalis. In control rats untreated after exposure typical corrosive burns shortly developed at the exposed site, with loss of function of the extremity, and the rats died. Others treated by chemical neutralization shared the same fate, the clinical picture and course of the burn differing only slightly from those which were untreated. Possibly the heat of chemical neutralization is as damaging to the tissues as is the irritant action of the offending agent.

A third group of rats similarly exposed to acids and alkalis were simply treated by thorough lavage with water. These animals showed a minimum of gross pathologic changes. No disability of the extremity ensued and all survived.

The first requisite for immediate treatment then is lavage with water. Practically, however, this principle is not applicable except prophylactically. By the time these patients present themselves to the surgeon an elastic grayish brown crust has already formed, covering an ulceration varying in extent and depth depending on the quantity of cement to which the skin has been exposed. By the third day, when these cases are usually first seen, this scab is extremely tenacious and firmly adherent to the underlying tissue.

Even after an elapsed interval of three days, necrosis undoubtedly continues further, as shown in figure 5. Theoretically it would be desirable to cleanse the burned areas by vigorous scrubbing in order to remove the collection of cellular debris, coagulated serum and cement which constitute the scab. This is not practical since the necrosed areas, though isolated and usually not covering an area greater in size than 2 square inches, are in most cases multiple. Such mechanical scrubbing, however desirable, would require general anesthesia even in the case of small single burns, since infiltration with a local anesthetic in such potentially infected areas is contraindicated. We have tried topical application of procaine hydrochloride, cocaine and the like but have found them ineffective, since these solutions do not penetrate the scab.

These lesions are not amenable to the tannic acid, gentian violet or silver nitrate treatment which has been so generally applied to the thermal burn. It would be undesirable to seal over such areas with a crust not only because of the danger of infection but also because the offending chemicals would be further sealed in the tissues. Serious toxic symptoms have not developed in our cases, since the burned areas, though multiple, did not cover large areas.

The application of a soothing ointment usually loosens the crusts within twenty-four hours, leaving a fairly clean, ragged ulcer. In truth, at the time that such cases come to our notice we are confronted not so much with a burn as we are with an acute ulcer.

Further treatment following removal of the scab then involves the treatment of a simple, acute ulcer, provided

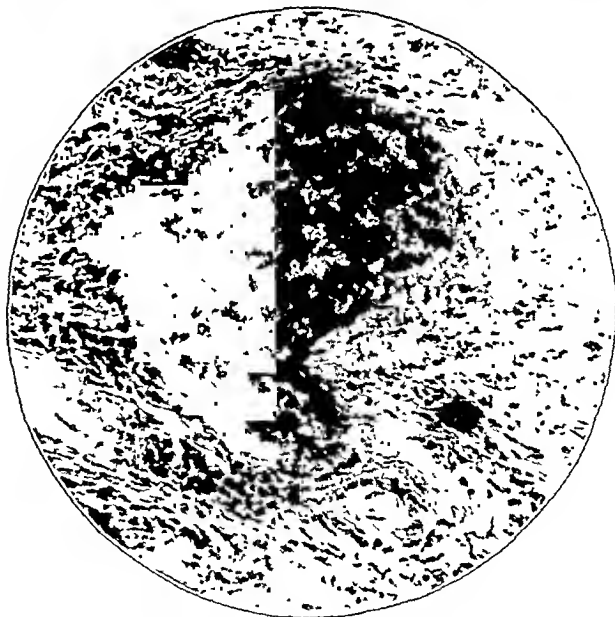


Fig. 7.—Human skin three days after exposure to cement. Slightly reduced from a photomicrograph with a magnification of 960 diameters.

infection does not supervene. Once clean granulations appear, the use of cod liver oil in an ointment has proved satisfactory.

CONCLUSIONS

1. Cement burns are theoretically preventable.
2. Sixty cement burns were treated in the past year and a half, resulting in a loss of 642 working days.
3. Cement burns differ markedly from thermal and acid burns from the standpoint of the symptoms,

3. Davidson, E. D.: The Treatment of Acid and Alkali Burns, *Ann Surg.* 85: 481 (April) 1927.

pathologic changes and treatment in that the alkaline albuminates are soluble in the alkalis and are thus redissolved and reprecipitated; the chemical meanwhile penetrates and extends deeply into the tissues until it is entirely dissipated.

4. In 20 per cent of our cases infection developed, showing a marked susceptibility to this complicating factor in such lesions.

5. After the removal of the thick, tenacious crust, further treatment involves the care of the resulting simple acute ulcer.

6. Prophylaxis consists in thorough lavage of the exposed parts with water immediately following exposure to cement or concrete and the smearing of the frequently involved parts with a heavy petrolatum ointment.

350 Post Street.

CYSTITIS FOLLICULARIS

WITH A DISCUSSION OF THE OTHER PROLIFERATIVE LESIONS OF THE BLADDER AND
REPORT OF FOUR CASES

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WASHINGTON, D. C.

Among the more rare types of inflammatory lesions in the chronic cystitis group is the proliferative lesion which presents sufficient vesical manifestation to warrant a careful report of the cystoscopic and microscopic observations. It is of general clinical interest, owing to the fact that hematuria is so outstanding.

CLASSIFICATION

In cystitis follicularis the mucosa of the bladder is studded with nodules of various sizes, containing lymph follicles with germinal centers. Hinman and his associates¹ gave an excellent description of these proliferative lesions and divided them into six groups: granular, glandular, follicular, cystic and emphysematous cystitis and bullous edema. Prior to this classification little attempt had been made to group properly these unusual lesions of the bladder. Livermore,² quoting White and Martin, classified these epithelial cysts clinically as large and small. He reported a case in which the cyst had assumed a rather large size. Despite Hinman's¹ broad classification, some present day writers are still prone to group these lesions under confusing headings. Redewill³ expressed the belief that many lesions formerly diagnosed as bullous edema and cystitis cystica were minute gas cysts, i. e. cystitis emphysematosa. Levin⁴ reported a case of gas cysts in the bladder resulting from *Bacillus welchii* in a diabetic patient. Sanes and Doroshov⁵ reported two cases of similar involvement, one that of a diabetic person. In all of these cases of gas cysts *Bacillus coli* was found, and Nowicki⁶ said this organism is the cause of cystitis emphysematosa. Paschakis⁷ was one of the first to point out that pyelitis

follicularis and pyelitis granulosa were separate disease entities. He described two types, the first containing actual lymph nodes with all their characteristics and the second showing aggregations of round cells of inflammatory origin. (Having made similar observations in two of my cases, I can substantiate this point.) Zuckerkandl⁸ also described a true and a false type. In the former the lymph follicles are rounded, the peripheral cells being closely crowded together in rows with typical germinal centers. The second form is cystitis pseudofollicularis, with no germinal centers and the cellular arrangement widely distributed and showing no palisading of cells at the periphery. Colonel Ash and I recently saw some specimens removed at biopsy in a case in which a diagnosis of malignant growth of the bladder had been made elsewhere, and our study showed a histologic picture not unlike that of cystitis pseudofollicularis. Several nodules were observed in the mucosa of the bladder and on biopsy were seen to contain a large number of lymphocytes, with no evidence of the typical cellular arrangement of cystitis follicularis or of germinal centers.

Another and more destructive form of cystitis is the gangrenous type, characterized by total destruction of the mucosa of the bladder. Two cases of this type were observed and reported by Hopkins and me⁹ in 1934.

This study comprises four cases of proliferative lesions of the bladder, in the first one of which there

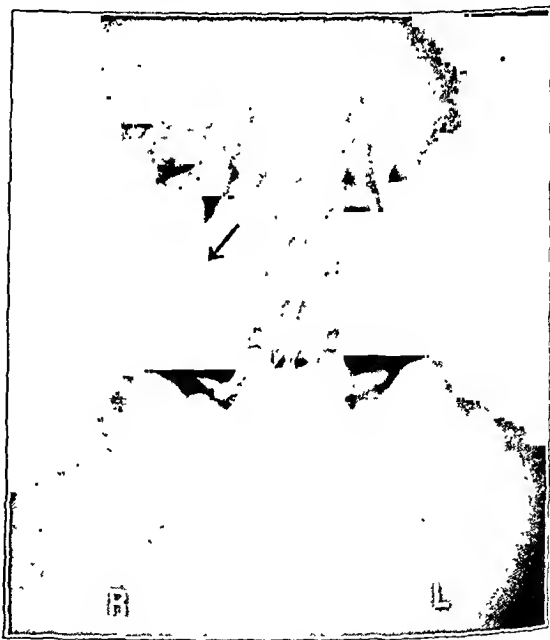


Fig. 1 (case 1).—Intravenous urogram showing a filling defect below the right ureteropelvic junction. This was a constant observation on every pyelogram. A nest of gallstones appears just above and lateral to the upper right calix.

was a unique histologic picture of cystitis follicularis, cystitis cystica and cystitis glandularis concomitant with pyelo-ureterocystitis follicularis. The second case was one of primary cystitis follicularis without apparent involvement of the kidneys or ureters. (These observations, to my mind, refute the statement of Baetzner¹⁰

Drs. Ash, Cajigas and Jarman gave valuable assistance in the study of the cases reported.

1. Hinman, Frank; Johnson, C. M., and McCorkle, J. H.: *Pyelitis and Ureteritis Cystica*, J. Urol. **35**: 174-189 (Feb.) 1936.

2. Livermore, G. R.: *Cyst of the Bladder*, Tr. Am. A. Genito-Urin. Surgeons **28**: 209-215, 1935.

3. Redewill, F. H.: *Cystitis Cystica Emphysematosa*, Urol. & Cutan. Rev. **38**: 537-543 (Aug.) 1934.

4. Levin, H. A.: *Gas Cysts of Urinary Bladder*, J. Urol. **39**: 45-52 (Jan.) 1938.

5. Sanes, S., and Doroshov, G. D.: *Cystitis Emphysematosa*, J. Urol. **22**: 278-286 (Sept.) 1934.

6. Nowicki, W.: *Ueber Hamblasenemphysem*, Arch. f. path. Anat. **205**: 126, 1914.

7. Paschakis, R.: *Beitrage zur Pathologie des Nierenbeckens*, Folia urolog. **7**: 55, 1912.

8. Zuckerkandl, O.: *Ueber die sog. Cystitis cystica und über einen Fall von cystischen Papillom der Harnblase*, Monatsb. f. urol. **7**: 521, 1902.

9. Stirling, W. Calhoun, and Hopkins, G. A.: *Gangrene of the Bladder: Report of Two Cases*, J. Urol. **31**: 517-525 (April) 1934.

10. Baetzner, W.: *Beitrag zur Kenntnis der Pyelitis granulosa*, Ztschr. f. urol. Chir. **1**: 285-294, 1913.

that the process is always initiated in the renal pelvis and extends downward through the ureters to the bladder.) The third case presents an interesting histologic study of lesions of the bladder, in that cystitis follicularis and cystitis glandularis were found present in the same specimen. The fourth was an instance of cystitis granulosa simulating a vesical neoplasm.



Fig. 2 (case 1). Cystoscopic appearance of the bladder, showing the distribution of the nodules in cystitis follicularis. Just below the left ureteral orifice is seen the larger nodule (A) representing cystitis cystica.

In 1913 Kretschmer¹¹ reported a case of pyelitis follicularis. Hundley and Carson¹² in 1929 reported three additional cases. In two of these the diagnosis was made after the kidneys had been removed for tuberculosis, and in the third it was made at necropsy. They mentioned prolonged intermittent hematuria as an outstanding symptom. I have reviewed the literature since that time and have found but ten cases, in all of which

diagnosis was made either after the kidney had been removed because of bleeding or at necropsy.

Before Hinman and Cordonnier¹³ presented their report in 1935, but little had been written on this subject. Since that time I have been unable to find any reports of similar involvement in the literature. A total of only eleven cases of pyelitis follicularis are on record. Loewenhardt¹¹ and Kretschmer¹¹ were the first to report single cases of cystitis follicularis. In 1935 Hinman and Cordonnier¹³ reported five cases in which the diagnosis was made from specimens removed for biopsy from the mucosa of the bladder. This made a total of eight cases of proved cystitis follicularis on record. In the cases reported by Loewenhardt,¹¹ Kretschmer¹¹ and Hundley and Carson,¹² in which the bladder was involved, similar lesions were seen also in the kidneys.

ETIOLOGY

The cause of this type of lymphoid hyperplasia of the bladder is still unknown, although it is probably the result of a long-standing infection. Loewenhardt¹⁴ mentioned syphilis as a factor, whereas Baetznar¹⁰ expressed the belief that typhoid is responsible in some cases. Von Frisch¹⁵ expressed the opinion that gonorrhea must be considered. Symmers¹⁶ described their formation as a response of the tissues to a toxic irritant and cited tuberculosis as a good example of toxic lymphoid hyperplasia. None of these diseases were present, however, in my four cases. The colon bacillus was found in urine from the bladder in all of the cases reported in the literature and was also present in my cases. Alexander¹⁷ mentioned cystitis resulting from

stone, from stricture and from tuberculosis as capable of producing lymphoid tissue in the bladder. Other observers have found similar lesions in the renal pelvis after the removal of a stone. Cystitis granulosa is seen more often than any other proliferative lesion and is the result of a long-standing irritation of the bladder.

SYMPTOMS

Disturbance of urination is the only characteristic symptom observed in this condition. Frequency, urgency or burning on urination is present, and pain over the bladder is constant. The vesical tenesmus is as severe as that seen in tuberculosis or interstitial cystitis. Massive hematuria has been a symptom in all but one of the cases of pyelitis follicularis, as well as in most of those of cystitis emphysematosa reported, but was present in only one of the cases of cystitis follicularis reported by Hinman.¹ It was present in but two of my cases, one in which the renal pelvis and ureters were involved and the other the case of cystitis granulosa which had become ulcerated.

Pain in the costovertebral angle and bilateral ureteral pain simulating the passage of blood clots was observed in one case. Women are more prone to this condition



Fig. 3 (case 1).—Bilateral retrograde pyelogram showing the same filling defect in the right ureter as seen in figure 1. These defects are indicated by the arrow. Other filling defects may be noted in the lower part of the right ureter, as indicated by the smaller arrows. Marked ureterectasis is present in the middle third.

than men (6 to 1), owing probably to the frequency of cystitis in women. It occurs during every decade, though most often during the fourth.

DIAGNOSIS

Cystitis follicularis cannot always be differentiated from the other proliferative types of cystitis clinically, and the possibility of two distinct lesions of a similar etiologic background in the same patient must always

11. Kretschmer, H. L.: Pyelitis Follicularis, Tr. Am. Urol. A. 7: 94-104, 1913.

12. Hundley, J. M., Jr., and Carson, W. J.: Pyelitis Follicularis, J. Urol. 21: 341-351 (March) 1929.

13. Hinman, Frank, and Cordonnier, Justin: Cystitis Follicularis, J. Urol. 34: 302-308 (Oct.) 1935.

14. Loewenhardt, F.: Cystitis Follicularis, Arch. f. Dermat. u. Syph. 84: 395, 1907.

15. von Frisch, A.: Kongress zu Berlin, Verhandl. d. Deutsch. Gesellsch. f. Urol., April 1909.

16. Symmers, Douglas: Relationship of Toxic Lymphoid Hyperplasias to Lymphosarcoma and Allied Diseases, Arch. Int. Med. 21: 236 (Feb.) 1918.

17. Alexander, S.: Some Observations Respecting Pathology and Pathological Anatomy of Nodular Cystitis, J. Urol. & Genito Urin. Dis. 11: 245, 1893.

be considered. Mills¹⁸ said: "Cystitis cystica and granulosa have been confused both clinically and as viewed through the cystoscope. Lantenschlager reported a case as cystitis emphysematosa which later proved to be cystitis granulosa at necropsy." Redewill³ said that air cystograms are helpful in detecting the presence of general emphysema of the wall of the bladder. The

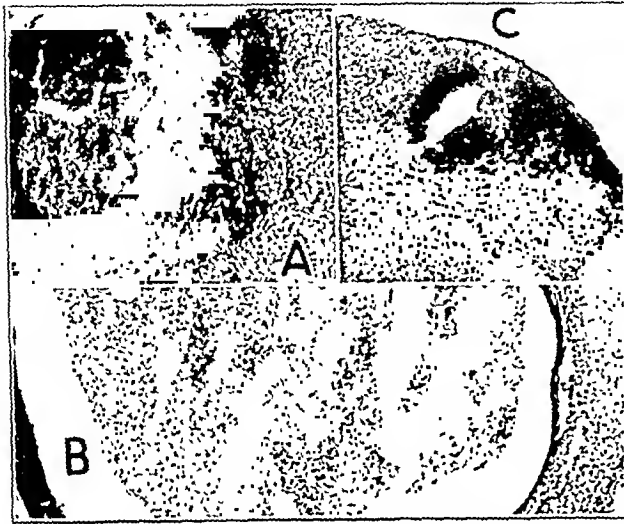


Fig. 4.—Sections showing cystitis follicularis (A), cystitis cystica (B) and cystitis glandularis (C) in the same biopsy specimen. This represents the atypical nodule (A) seen in figure 2 ($\times 70$).

final diagnosis must obviously rest on an examination of the specimen removed for biopsy. Cystoscopic examination in cystitis follicularis shows the mucosa of the bladder covered with nodules of varying size, rather closely packed together and of a red-grayish color. They are firm on pressure, whereas in cystitis cystica they are more uneven in size and appear translucent. Cystitis glandularis, on the other hand, rarely presents a distinct cystoscopic picture. The gas filled cysts in cystitis emphysematosa are more translucent than those filled with fluid, and the nodules can be seen best if the bladder is only partially filled with fluid, the nodules appearing in bas-relief. Cystitis granulosa and cystitis polyposa are more easily recognized, owing to the "cluster-like" arrangement of the granulation tissue. Ulceration may occur, as happened in my case, and thus simulate a new growth in the bladder. New-formed capillaries are prominent throughout the loose areolar tissue.

REPORT OF CASES

I wish to analyze briefly four of my cases:

CASE 1.—Mrs. W. D. H., 35 years of age, admitted to Garfield Hospital on June 1, 1937, complaining of intermittent hematuria and pain in the back, had had painless hematuria lasting one week fourteen years before. No further symptoms were noted until two years later, when a similar attack occurred. Since that time she had had intermittent attacks of pain and hematuria three or four times each year. May 31, 1937, the patient had a severe attack of bleeding, with pain on urination and passage of large clots of blood. She consulted her family physician at this time and was sent to the hospital, where she was seen by me for the first time.

A catheterized specimen of urine was grossly bloody, with a large number of clots. A complete study of the blood was done, revealing a moderate degree of anemia with a nonprotein nitrogen content of 65 mg. per hundred cubic centimeters of blood. No blood dyscrasia was present. After evacuation

of many blood clots, cystoscopic examination revealed blood coming from the right ureteral orifice. The capacity of the bladder was found to be 400 cc. Urine from the right kidney showed many red and a few white blood cells, and culture showed *Staphylococcus albus* anhaemolyticus and *Staphylococcus aureus* anhaemolyticus. The left kidney showed a few white blood cells and an occasional red blood cell. Culture revealed *Staphylococcus aureus* anhaemolyticus. Intravenously administered indigo carmine was recovered in normal concentration from both sides, with a slight delay on the right. A retrograde pyelogram of the right kidney showed none of the skioidan in the renal pelvis but did show marked dilatation of the upper part of the right ureter. Intravenous pyelographic study was done later and showed some filling defects in the wall of the upper part of the ureter on the right side. A nest of gallstones appeared just above the superior calyx (fig. 1). These stones produced so much biliary colic that a cholecystectomy became necessary and was successfully performed.

A second cystoscopic examination November 12 was more satisfactory, as the bleeding had stopped. The entire mucosa of the bladder (fig. 2) was covered by numerous nodules from 1 to 3 mm. in diameter. They were solid and more numerous on the posterior wall. The mucous membrane showed generalized capillary injection. About 1 cm. below and mesial to each ureteral orifice was a group of nodules, different in appearance from those previously described. These were larger, opaque and whitish. Cultures of material from each kidney were negative, although culture of material from the bladder revealed the colon bacillus. The nonprotein nitrogen content of the blood at this time was 45 mg. per hundred cubic centimeters. An intravenous test of renal function was done, with normal appearance time and output on both sides. A retrograde pyelogram (fig. 3) showed moderate pyelectasis on the right side, with marked dilatation and tortuosity of the right ureter. There was some kinking of the ureter just below the right ureteropelvic junction, with a constant filling defect in this area, suggestive of a solitary lymph follicle. Other filling defects were noted in the wall of the lower part of the right ureter. A pyelogram of the left side was normal. The upper part of the ureter, however, appeared slightly irregular.

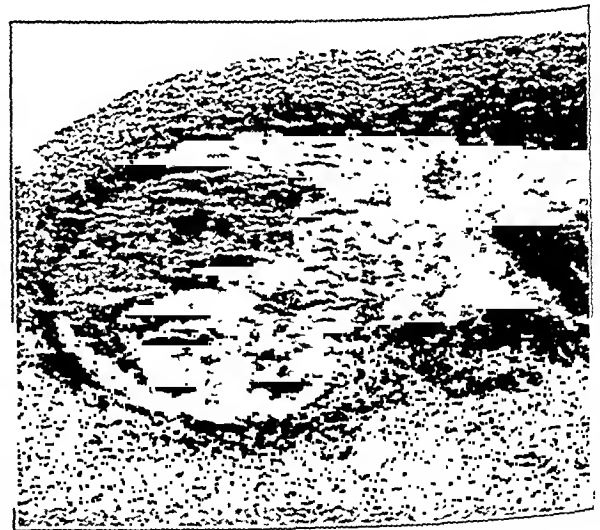


Fig. 5 (case 1).—Section of a typical nodule. This specimen contains four lymphoid follicles; $\times 75$.

The atypical nodule (fig. 4) located 1 cm. below and mesial to the left ureteral orifice revealed a large cystlike area covered with intact epithelium. Adjacent to the cyst were a solitary lymph follicle and a gland lined with columnar epithelium. The stroma was made up of densely packed deeply stained small lymphocytes. The center of the nodule appeared less densely packed, with much lighter staining young lymphocytes resembling the typical germinal center seen in the

18. Mills, R. G.: Cystitis Emphysematosa, *J. Urol.* 24: 217-231 (Sept.) 1930.

lymphatic structures. Examination of one of the typical nodules (fig. 5), which were numerous, revealed four distinct lymphoid follicles, all of which were covered by mucous membrane. None of these showed evidence of ulceration. The diagnosis was cystitis follicularis associated with cystitis cystica and cystitis glandularis (Col. J. E. Ash and Dr. Tomas Cajigas).

CASE 2.—Mrs. B. A., aged 40, first seen Dec. 21, 1937, complaining of frequency, urgency and burning on urination,

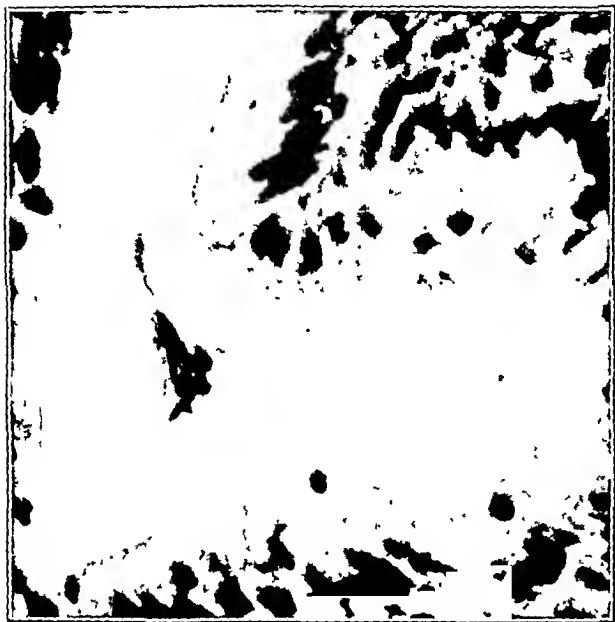


Fig. 6.—High power enlargement of a typical gland lined by columnar epithelium. The gland is filled with mucus and degenerated leukocytes.

had undergone myomectomy for uterine bleeding in October 1937. A month later she began having pain and burning on urination, which had continued to the time of examination. She had not passed any blood in the urine, had had no previous similar attacks and had entirely recovered from the operation. The menstrual history was normal, and she had never been pregnant. The past history was irrelevant. An excretory pyelogram showed a normal concentration of the dye in each kidney, with no abnormalities. The ureters were well outlined, and no cystic changes were seen in the walls of the ureters. The function of the kidneys was equal and within normal limits.

Complete study of the blood, including a Wassermann test and a determination of nonprotein nitrogen, showed no abnormality.

A catheterized specimen of urine showed *Bacillus coli* in pure culture, with an occasional pus or red blood cell. The capacity of the bladder was 360 cc.

Cystoscopic examination revealed several small cysts in the vesical orifice, extending well around the circumference. They appeared solid and reddish. They did not give the typical cystoscopic picture of cystitis cystica but did resemble the follicular lesions seen in the first case. The entire trigon was covered with a large number of small solid nodules. There was an area of leukoplakia just medial to the left ureteral orifice. The rest of the bladder was congested but showed no nodules. No evidence of bleeding or ulceration was noted. The clinical diagnosis was cystitis follicularis. Biopsy confirmed the cystoscopic diagnosis. The remaining nodules were destroyed by fulguration, including those situated in the vesical orifice. It was believed that all the cysts were thus destroyed.

A microscopic examination of the removed nodule showed it to be covered with transitional epithelium, under which there were two lymph follicles supported by loose connective

tissue of moderate vascularity. The germinal centers showed moderate hyperplasia. No evidence of malignancy was noted. The diagnosis was cystitis follicularis (Capt. Elbert DeCoursey).

CASE 3.—Mrs. N. B., aged 48, white, admitted to Georgetown Hospital Sept. 7, 1938, complained of severe pain in the region of the bladder, with frequency and urgency on urination. The present attack had begun about six weeks before, with severe pain over the region of the bladder at the end of urination. The symptoms increased in severity until she was voiding every thirty minutes during the twenty-four hours. No blood was passed and no previous similar attacks had been experienced. Her general health, weight and appetite were normal.

A catheterized specimen of urine contained many pus and a few red blood cells. Cultures showed *Bacillus coli* of the *Aerobacter* strain. A preliminary roentgenogram gave negative results, as did routine study of the blood. An intravenous pyelogram showed the upper part of the urinary tract to be normal. The cystogram showed many small, irregular defects along the superior margin of the bladder, suggestive of small papillomas (Dr. F. O. Coe).

A cystoscopic examination showed the trigon and posterior wall of the bladder to be covered by discrete rounded reddish nodules from 1 to 3 mm. in diameter. They appeared solid and were not ulcerated. A cystoscopic diagnosis of cystitis follicularis was made. Five nodules removed for microscopic study showed typical lymph follicles with germinal centers. One section of the specimen revealed the presence of two typical glands in addition to the lymph follicles (fig. 6). The diagnosis was cystitis follicularis and cystitis glandularis (Col. J. E. Ash).

CASE 4.—Mrs. L. H., aged 56, seen Nov. 16, 1938, complaining of hematuria and frequent and painful urination, stated that she had had pain in the region of the bladder with the passage of blood clots for four months. The pain was confined to this region and came on at the end of urination. She had nocturia (six or eight times). The bleeding usually

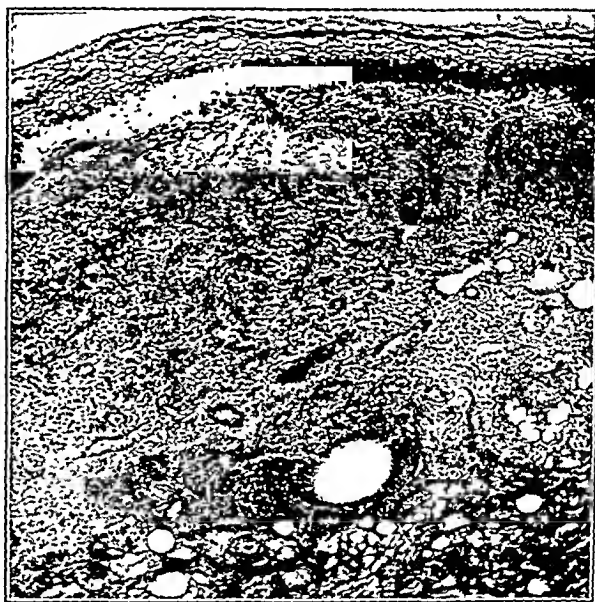


Fig. 7 (case 4)—Section showing cystitis granulosa. There is metaplasia of the vesical epithelium, and the lymph follicles are absent; X 70.

came on at the end of urination and was intermittent, though it had gradually increased in amount during the preceding week. She had not lost any weight and her general health had been excellent. Her past history revealed no similar attack, and aside from the usual diseases of childhood she had not had any severe illness. She had three children living and well and her menstrual history had been normal, including a normal menopause.

A catheterized specimen contained a large number of pus and red blood cells. Culture showed *Bacillus coli*. A preliminary roentgenogram was normal, as were the results of complete study of the blood. A cystoscopic examination under gas anesthesia on November 21 revealed a circumscribed group of polyps in the trigon; these were approximately 1 cm. in diameter. Ulceration was present and numerous small blood vessels could be seen, one of which was producing the bleeding. The remainder of the bladder was free from any similar lesions, though generalized cystitis was present. A biopsy specimen was taken from the granuloma and on microscopic examination showed metaplasia of the vesical epithelium. The underlying structures consisted of granulation tissue which was fairly vascular, with numerous typical fibroblasts. There was considerable infiltration with lymphoid and pus cells. There

months and the third is responding well to similar measures. The fourth patient has been seen recently and has had no recurrence of pain or bleeding. The frequency of urination has also lessened.

COMMENT ON CASES

Whether lymphoid tissue is a normal constituent of the mucosa of the urinary tract remains unsettled, though most writers agree that it may be found occasionally. Ash¹⁹ said "Lymphoid tissue may occasionally be present in the mucosa of the bladder, although it is very uncommon." Ewing²⁰ stated that "lymphoid tissue is very rare in the normal bladder, but as in all other mucous membranes, mild grades of chronic

Summary of Cases of Pyelitis Follicularis

Author	Age	Sex	Chief Complaint	Diagnosis	Cystoscopic Observations	Microscope Observations	Treatment	Result
1. von Frisch..... (1906)	36	♂	Profuse intermittent hematuria	Pyelitis follicularis	Not stated	Granular pyelitis, solitary follicles	Nephrectomy, left	Cured
2. von Frisch..... (1907)	30	♂	Gross bloody urine	Pyelitis follicularis	Not stated	Pyelonephritis, lymph follicles found in kidney	Nephrectomy, right	Cured
3. von Frisch..... (1907)	37	♀	Bleeding from kidneys	Pyelitis granulosa follicularis	Not stated	Entire kidney degenerated	Nephrectomy, right	Cured
4. Lowenhardt..... (1905)	33	♀	Strangury, hematuria, frequency	Pyelitis, cystitis follicularis	Bladder, nodular region, trigon	Nodules in bladder were lymph follicles	Nephrectomy, right	Cured for a time but recurred
5. Taddel..... (1907)	23	♀	Hematuria, four weeks' duration	Pyelitis follicularis	Blood coming from left kidney	Renal pelvis contained many lymph follicles	Nephrectomy, left	Cured
6. Soleri and Zanelli... (1905)	42	♀	Profuse hematuria, frequency, urgency	Pyelitis follicularis	Blood from left kidney, bladder normal	Pelvis filled with sandlike excrescences, lymph follicles	Nephrectomy, left, after cystotomy	Cured
7. Kretschmer..... (1912)	36	♀	Albuminuria, chills, fever, pyuria, frequency of urination	Pyelitis follicularis, pyonephrosis	Pus in right kidney, normal left; bladder normal	Renal pelvis showed lymph follicles with germinal centers	Nephrectomy, left	Cured
8. Stirling..... (1937)	33	♀	Gross hematuria, dysuria, pain, frequency of urination	Pyelo-ureterocystitis follicularis, cystitis cystica	Bladder studded with nodules and cysts	Large number of lymph follicles with germinal centers, also cysts of cystitis cystica	Renal lavage, dilatation of ureter, fulguration of bladder cysts	Improved
9. Baetzner..... (1913)	34	♂	Hematuria, pyuria, pain and burning urination	Pyelo-ureterocystitis follicularis	Many diffuse nodules covering trigon	Nodules containing lymph follicles with germinal centers	Nephrectomy, left	Cured
10. Hundley and Carson... (1923)	40	♀	Hematuria, pain in right side for many years	Pyelitis follicularis, hydronephrosis, hydro-ureter	Bladder inflamed and ulcerated	Lymphoid hyperplasia of pelvis	Ureteral dilation, renal lavage, nephrectomy on right	Cured
11. Hundley and Carson... (1923)	30	♀	Pain in left kidney, frequency, dysuria, hematuria for several months	Pyelitis follicularis, tuberculous of kidney suspected	Bladder normal x-ray showed calcareous renal deposit	Kidney contracted, contained many nodules of lymphoid cells	Nephrectomy on left for chronically infected functionless kidney	Cured
12. Hundley and Carson... (1923)	45	♂	Admitted unconscious; no history	Pyelitis, cystitis follicularis	Not performed	Diffuse lymphoid hyperplasia of kidneys, ureters, bladder	.....	Died

was no evidence of malignancy (fig. 7). The whole area was thoroughly fulgurated with a resectoscope. The patient had no further bleeding or pain other than that incidental to the vesical instrumentation. The diagnosis was cystitis granulosa (Drs. Cajigas and Ash).

TREATMENT

Eradication of the long-standing vesical infection, chiefly by the *Bacillus coli* group, should be attempted by elimination of any focus of infection, such as the teeth, tonsils, gallbladder, colon and rectal crypts. Oral therapy with either sulfanilamide or mandelic acid should be tried. Fulguration of individual nodules has been of value in some cases and was successful in all my cases. Ureteral dilation, renal lavage and the establishment of free drainage are essential. Nephrectomy is usually contraindicated in pyelitis follicularis, as the two renal pelvis are similarly affected. Two of my patients have now been symptom free for several

catarrhal inflammation are often associated with the development of small lymph cell collections. In such cases it is difficult to determine whether such bladders are normal or pathological." He concluded that "well formed lymph follicles with germinal centers are so very rare in the normal bladder that their presence would raise a suspicion of a pathological state." Chiari²¹ and Przewoski²² expressed the opinion that its presence in this location is pathologic. Stoerk²³ was unable to find it in the bladder of the newborn.

Cystitis emphysematosa, cystitis granularis and cystitis cystica, on the other hand, are seen and diagnosed

19. Ash, J. E.: Personal communication to the author, 1938.
20. Ewing, James: Personal communication to the author, 1938.
21. Chiari, H.: Ueber das Vorkommen lymphatischen Gewebes in der Schleimhaut des harnleitenden Apparates des Menschen, *Med. Jahrb.*, 1881, p. 9.
22. Przewoski, E.: Ueber noduläre oder folliculäre Entzündung der Schleimhaut der Harnwege, *Arch. f. path. Anat.* 116: 516, 1889.
23. Landsteiner, K., and Stoerk, O.: Beitr. z. path. Anat. u. z. allg. Path. 36: 131, 1904.

much more frequently than the follicular type, sixty cases of cystitis cystica having been reported by Morse.²¹

Strachstein²⁵ found the renal pelvis and ureters involved in two of 3,000 autopsies. It has been suggested that cystitis cystica represents a later stage of cystitis glandularis, owing to rupture and opening of the cysts, and thus accounts for mucus issuing from an organ without mucous glands (Hinman¹). Giani²⁶ reported the accidental production of cystitis cystica by introduction of gelatin-coated capsules containing tubercle bacillus into the bladder of rabbits. Other writers ascribed their presence to "cell nests," as described by von Brunn.²⁷

Aschoff,²⁸ Reisman²⁹ and other early writers said that true glands are not found in the bladder, whereas Zackerkandl,⁸ Ash¹⁰ and Cajigas³⁰ have found true glandular tissue in the normal bladder, especially in the region of the vesical outlet.

In reviewing the literature on these proliferative lesions, I have not found any mention of the concomitant presence of cystitis cystica, cystitis follicularis and cystitis glandularis. In Kretschmer's¹¹ case both cystitis follicularis and cystitis glandularis were present. Mills¹⁸ reported a case of cystitis cystica with cystitis emphysematosa. It would not be surprising, however, to find such an association, in view of their supposed common source.

In the first case the diagnosis of pyelo-ureterocystitis follicularis was based on the history of repeated attacks of bilateral renal bleeding, and urographic evidence of filling defects in the kidney and ureter. Cultures of material from both pelvises were positive. In the other three cases there was no evidence of renal involvement.

ANALYSIS OF CASES

A critical histologic study of the four cases reported herein as well as the ones reported by other recent writers discloses the fact that in few instances does cystitis present a pure type of lesion. Two or more proliferative lesions may be present simultaneously. Thus the diagnosis would rest on the predominance of a certain type of lesion.

CONCLUSIONS

Four cases of cystitis follicularis were observed. In the first the condition was associated with cystitis cystica and cystitis glandularis, with lesions in the kidneys and ureters. In the second case the picture was uncomplicated, in the third cystitis glandularis was present and in the fourth cystitis granulosa.

The treatment in general should be limited to eradication of foci, oral therapy and cystoscopic destruction of the local lesions. Nephrectomy is usually contraindicated, owing to bilateral involvement of the renal pelvises in the pyelitis group. In cases of unexplained hematuria a careful search should be made of the mucosa of the bladder as proliferative cystitis is not as rare as the scarcity of cases would seem to indicate. Biopsy of any suspicious lesion, followed by fulguration, should be the rule.

Clinical Notes, Suggestions and New Instruments

ECHINOCOCCUS CYSTS OF THE LIVER OF FIFTY-SIX YEARS' DURATION

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Although echinococcus cysts are not of common occurrence in the United States, they are of sufficient interest always to be considered in the differential diagnosis of tumors of the liver. They grow slowly, but it is not often known for exactly how many years a patient has harbored the parasite. Magnusen¹ has reported a case under observation for forty years, and Holmes² reported a case in which the parasite was present for forty-six years. It is rare that one has positive proof of the length of duration of the infestation, and when one has, the case is sufficiently interesting to be worthy of a report.

F. T., a man aged 67, an Englishman, was admitted to the Alameda County Hospital Aug. 2, 1937, complaining of an intermittent pain in the lower dorsal and upper lumbar part of the back and the upper part of the abdomen, which he had had since 1926. At that time he was hospitalized and his condition was attributed to a spinal disorder, and subsequent treatment proved ineffective. Two years before the pain had begun to be more severe in the abdomen than in the back, particularly over the right half of the upper part of the abdo-



Fig. 1.—The wound, with two small cysts which have just been extruded from the liver.

men, radiating into the right flank. This pain was sharp and stabbing, frequently lasting three or four days without remission, with a three or four month interval of complete relief between episodes. Such bouts were so severe that the patient was confined to bed and required from ten days to two weeks for recovery. The pain had no relation to food; he had had no hematemesis, bloody stools, jaundice, flatulence, nausea or vomiting. Constipation had always been troublesome. He had lost about 13 pounds (6 Kg.) in the last two years.

Prior to entry he had called in his physician, who thought the pain was possibly arising from the right kidney and referred him to a urologist. A pyelogram revealed a normal right kidney, but a mass in the right upper part of the abdomen was palpated and he was referred to the hospital.

The patient was born in England and was a storekeeper by trade. He used considerable alcohol in his youth. He mentioned that he used to swim a good deal in a farming district. In 1882, when he was 11 years old, his abdomen enlarged and he was admitted to St. Bartholemew's Hospital, London, where his abdomen was tapped and his condition diagnosed as "hydatid cyst" of the liver. The abdomen filled again in twenty-four hours, and the next day the cyst was removed surgically. He made a complete recovery. He left England when he was 13.

1. Magnusen, G.: Two Hundred and Fourteen Echinococcus Operations, Arch. f. klin. Chir. 100: 293, 1912.

2. Holmes, H. I.: Hydatid of the Liver of Many Years' Duration, M. J. Australia 1: 704 (May 25) 1929.

24. Morse, H. D.: The Etiology and Pathology of Pyelitis Cystica, Ureteritis Cystica and Cystitis Cystica, Am. J. Path. 4: 33-50 (Jan.) 1928.
25. Strachstein, Abraham: A Case of Pyelo-Uretero Cystitis Cystica, J. Urol. 36: 22-25 (July) 1936.
26. Giani, K.: Neuer Experimenteller Beitrag zur Entstehung der Cystitis Cystica, Zentralbl. f. allg. Path. u. path. Anat. 17: 900-902, 1906.
27. von Brunn, A.: Ueber drusenähnliche Bildungen in der Schleimhaut des Nierenbeckens der Ureters und der Harnblase beim Menschen, Arch. f. mikr. Anat. 41: 294-302, 1893.
28. Aschoff, Ludwig: Ein Beitrag zur normalen und pathologischen Anatomie der Schleimhaut der Harnwege und ihrer drüsigen Anhang, Arch. f. path. Anat. 138: 119-161, 1894.
29. Reisman, B.: American Text Book of Pathology, p. 994.
30. Cajigas, Tomas: Personal communication to the author, 1938.

Except for appendicitis, for which an appendectomy was performed in 1933, he had had no other complaints.

Examination showed that the patient was well developed and well nourished. He did not appear acutely ill. The teeth were in poor condition, with gingivitis present. The tonsils were mildly injected. The heart was enlarged and the apex beat palpable in the fifth interspace about 2 cm. outside the mid-clavicular line. There were occasional extrasystoles. The blood pressure was 128 systolic, 88 diastolic. A nonfixed, tender, discrete mass was felt in the abdomen, presumably the liver, four fingerbreadths below the right costal margin. Below this main mass two other masses were felt, one in the region of the gallbladder, measuring about 10 by 6 cm., and the other just to the left of the midline in the epigastrium, measuring about 6 by 4 cm. Postoperative scars were present in the right upper and the right lower part of the abdomen. The reflexes and the extremities were normal. Proctoscopic examination gave negative results. Examination of the blood showed 80 per cent hemoglobin, 4,420,000 red cells and 10,200 white cells, with 77 per cent polymorphonuclears, 18 per cent small lymphocytes, 1 per cent monocytes and 4 per cent eosinophils. A second count showed 1 per cent eosinophils. The Wassermann reaction was negative. The urine and feces were normal.

A plain roentgenogram of the abdomen showed evidence of an enlarged liver, with some flaky spots of calcification in the right upper quadrant in the region of the liver. Roentgen examination after a barium sulfate enema revealed no intrinsic lesion of the colon. The transverse colon was displaced downward by an enlarged liver. A gastrointestinal series showed the entire second portion of the duodenum to be pushed down and compressed by a large mass, which was palpable in that area and appeared to be continuous with the liver.

Intradermal injection of 0.7 cc. of echinococcus antigen produced an immediate wheal formation, which subsided in six hours.

The preoperative diagnosis was echinococcus cyst of the liver.

The operation was performed Aug. 27, 1937. With the patient under ether anesthesia, the abdomen was opened through an upper right rectus incision. The liver at first appeared to be enormously enlarged, but on closer inspection it was found that it contained a large cyst and that what was left of the liver was stretched tightly over this, the parenchyma being stretched to a thickness of about one-third inch around the circumference of the cyst. On palpation, hydatid fremitus was felt. A cystic

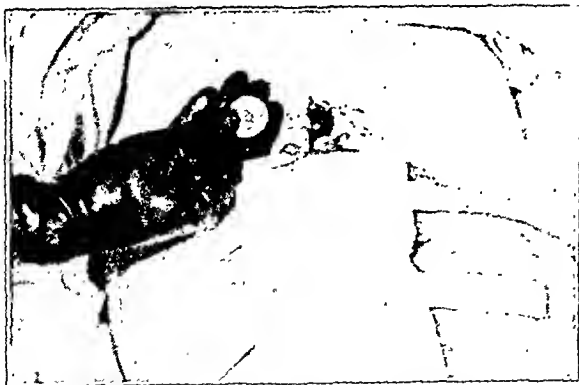


Fig. 2.—The wound, with several cysts being extruded.

mass hanging down from the lower border of the right lobe and a projection of the left lobe downward were the two masses palpated preoperatively. Obviously it was impossible to remove the entire cyst from within the liver. No free fluid was present. The intestine and colon were matted together with numerous though not dense adhesions, and interspersed between the coils were several cysts varying in size from 1 to 5 cm. in diameter. One of the larger of these cysts and the cystic mass attached to the right lobe of the liver were removed. It was impossible to open and drain the liver from its inferior border without spilling its contents within the peritoneal cavity, and, as numerous dense adhesions were felt between the superior-anterior aspect of the right lobe and the dome of the liver to the diaphragm and upper part of the peritoneum, it was

thought best to drain the cyst in this area, for it was already extraperitoneal. The peritoneum and fascia were closed, and a new 3 inch incision was made above this incision through the fascia until the dome of the liver was encountered. Two per cent solution of formaldehyde was injected into the hepatic cyst. With an electrocautery the liver shell was punctured through and the opening enlarged to about 3 cm. in diameter. Much clear fluid, numerous collapsed cyst walls and fewer intact cysts were removed. The wound was packed open with gauze, and the patient returned to his bed in good condition.

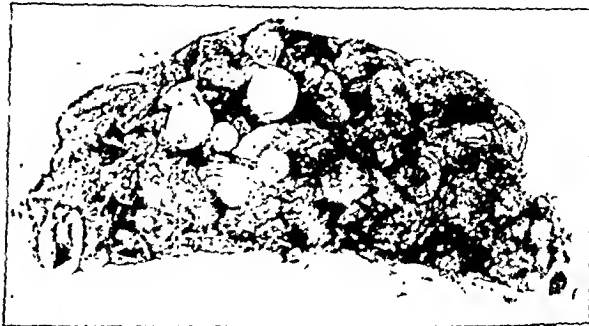


Fig. 3.—The cysts, some collapsed and others intact, immediately after the operation.

The marsupialized wound discharged many cysts and collapsed cyst walls daily. For three weeks the temperature was between 100 and 104 F. The patient appeared to be improving for one week after the operation; he then began to get listless, somnolent and mentally confused, with euphoria, had an increase in pulse rate with a drop in blood pressure, cold clammy sweating and moderate conjunctival icterus and appeared critically ill. A diagnosis of hepatic insufficiency was made, and fluids, including adequate amounts of dextrose and sodium chloride, administered intravenously, were given daily. The recovery thereafter was slow but steady. On the twenty-fifth postoperative day the patient was transferred to Fairmont Hospital for chronically ill patients. He continued to get stronger, ate well and improved. The drainage from the wound lessened, though there was a discharge of one or two cysts on the dressings daily for a month after his transfer, after which no more cysts were expelled and the wound began to granulate in. He left the hospital Thanksgiving day 1937. Subsequent to his return home he gained in weight and strength, was able to return to his occupation as a grocer and had no return of the severe abdominal pains previously complained of. In February 1938 his wound broke open and two cysts were discharged; after three days it healed again. At present he feels well and has no complaints. His incision is firm and nontender and the liver cannot be felt.

The future health of this patient is problematic. It would appear that, since he has harbored the parasite for fifty-six years, he has become partially immunized against it. As he has had time to establish a defensive reaction against the echinococcus he will no doubt continue to exercise it for years to come and will probably succumb to some other causative factor. Death from this parasite is not from a toxic reaction but from complications such as the growth and extension of the cysts into the vital parts of the body by pressure, rupture and secondary infection, with resultant toxemia. This patient has been fortunate in not having an infestation of a vital organ other than the liver, and the reparative powers of the liver are well known. At operation it was judged that only one fifth of the normal amount of hepatic tissue was present. The tissue has probably since regenerated to a greater amount, as evidenced by the clinical improvement to apparently normal health. Mann³ has shown experimentally, with dogs, that after removal of as much as 70 per cent of the liver the organ is repaired in twelve weeks not only by hypertrophy but by hyperplasia of the remaining hepatic cells. In man the regenerative capacity is probably the same when the cells are normal. The intra-hepatic pressure of the slowly enlarging cyst in this case was

3. Mann, Frank C.: The Effects of Complete and of Partial Removal of the Liver, *Medicine* 6: 419 (Dec.) 1927.

so great as to leave a shell of hepatic tissue averaging about one third inch, so that the hepatic cells could not have been functioning normally; consequently the regeneration must have been even slower than if they had been normal. The intra-hepatic and intracystic pressure gradually increased over a long period; hence the finding that the major portion of the contents of the cyst was ruptured walls of daughter cysts and only a comparatively small portion were intact daughter cysts. Lyon⁴ has shown that in cases of hepatic insufficiency, in addition to dextrose given intravenously, dehydrochloric acid given daily by the intravenous route furnishes a distinct support to the liver and hastens the reparative powers of the hepatic and especially of the Kupffer cells. Had it been available it would have been given in this case and no doubt would have hastened the recovery from hepatic insufficiency.

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TUBERCULOSIS OF THE MYOCARDIUM

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No organ of the body is safe from infection by tuberculosis, but the relative immunity of muscle tissue in general and heart muscle in particular excites interest and speculation. Although reports of myocardial tuberculosis have appeared in the literature with increasing frequency in recent years, positive proof of the causation is often lacking and the pathologic appearance varies greatly. In the case reported, tubercle bacilli were demonstrated in sufficient numbers to identify the lesion beyond question and the mode of entrance into the heart muscle was clearly not extension from the pericardium in the usual manner. The gross and histologic characteristics were definitely those of tuberculosis.

J. M., a white youth aged 19, was admitted March 3, 1937, to the White Haven Sanatorium in the service of Dr. Edward Bixby of Wilkes-Barre, Pa. Examination revealed extensive



Fig. 1.—Section through mass in wall of right ventricle, showing necrotic center with processes extending into the myocardium. Note that the epicardium and the heart wall just beneath are free from involvement.

bilateral pulmonary tuberculosis complicated by laryngeal tuberculosis. The patient's clinical course was one of continuous regression punctuated by two episodes of severe hemoptysis, the first shortly after admission and the second one month before death. No signs or symptoms of cardiac disease were manifest at any time.

4. Lyon, B. B. V.; Swalm, W. A.; Bartle, H. J., and Sterner, R. F.: The Therapeutic Effectiveness of Dehydrochloric Acid in Liver and Biliary Tract Disease, *M. Rec.* 139:123 (Feb. 7) 1934.
Read before the Laennec Society, Philadelphia, April 26, 1938.

At necropsy the body showed marked pallor and emaciation. There was edema of both ankles, especially the left. The pericardium held 25 cc. of straw-colored fluid containing two small flakes of fibrin. Its inner surface was smooth and glistening and presented no adhesions or other gross evidence of tuberculosis. The heart was normal in size and weighed 300 Gm. Its muscle was pale and soft. The left ventricle measured



Fig. 2.—Wedge-shaped area of exudate and hemorrhage extending into myocardium. Note the relatively normal muscle tissue immediately adjacent to the inflammation.

1.5 cm. and the right 1 cm. in thickness. The mitral valve was 9 cm. wide, the tricuspid 11 cm., the aortic 7 cm. and the pulmonie 8 cm. When the right ventricle was opened a large round mass, measuring 1.5 cm. across, was seen protruding into the chamber between the trabeculae near the apex (fig. 1). Adjacent to this were four smaller nodules. The large mass had a caseous center with processes extending into the surrounding heart muscle. None of these reached the epicardium, however. The endocardium over the nodules seemed to the naked eye to be intact, although antemortem thrombi were adherent to its surface near the interventricular septum and between the papillary muscles. There was no macroscopic evidence of tuberculosis of the coronary vessels, which were patulous and did not contain clots. No lesions were found elsewhere in the heart.

The pleura was thickened and adherent to the chest wall and diaphragm. On section both lungs showed extensive tuberculosis with cavitation and but slight attempt at fibrosis. There were anthracosis and tuberculosis of the hilar lymph glands but nothing to suggest that the myocardium was directly infected by the disease in the nodes.

Examination of the abdominal organs was not permitted.

Histologic examination revealed that in the center of each nodule was a mass of cellular detritus, and surrounding this area was a zone of small, round endothelial cells. No giant cells were seen. As many as three or four tubercle bacilli to a field were seen in sections from the caseous areas stained by the Ziehl-Neelsen method. The inflammation extended into the adjacent myocardium in the form of finger-like processes parallel to and separating muscle fibers into bundles. There was frequently seen in advance of the exudate a hemorrhagic area which appeared to produce pressure atrophy, and in places complete necrosis, of the muscle fibers. Thus weakened, the myocardial tissue apparently became more susceptible to the advancing disease (fig. 2). The pericardium and subpericardial tissues were normal. The endocardium was broken through by the infection in several places. The most likely portal of entry appeared to be the right coronary artery. Although there

were no tubercles in any of its branches, slight intimal thickening and perivascular infiltration were observed near the caseous masses.

In reviewing the literature we found that a total of sixty-four examples of tuberculosis of the myocardium were found in 14,493 tuberculous patients by different observers reporting large series of cases,¹ an incidence of 0.44 per cent. During the last nine years we have discovered the condition only once in 400 cases in which autopsy was performed. The reason for this relative immunity of the heart muscle remains problematic. The factors responsible in the present case are not clear unless it is assumed that the patient's existence for several weeks in a semioribund state so lowered his general resistance that the local resistance also was affected.

Clinically, tuberculosis of the myocardium has been diagnosed rarely, although it was suspected in several cases reported by Gouley, Bellet and McMillan² in which an ectopic rhythm appeared during the course of known tuberculous pericarditis. Prognostically it is unimportant, as it occurs only with far-advanced disease. There is of course no treatment.

COCCIDIOIDAL GRANULOMA SIMULATING BRAIN TUMOR IN A CHILD OF FOUR YEARS

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The following case report is of interest because of the relative rarity of coccidioidal granuloma and because it simulated brain tumor.

M. E. H., a girl aged 4 years, first seen Oct. 4, 1937, had been "losing ground" for six months and had had headaches for

unsteadiness of gait, with the child staggering to the left, had grown progressively worse. She had occasional pains in both legs. Mentally she had been alert.

At examination her height was found to be 40 inches (102 cm.) and her weight 31 pounds (14 Kg.). The frontal bosses were prominent and there was a high pitched percussion note over the calvarium. Moderate stiffness of the neck was



Fig. 2.—Coccidioidal tubercles.

present. The circumference of the head was 51 cm. There was marked choking of both optic disks. The Romberg sign was present. A roentgenogram of the skull revealed marked widening of all suture lines.

A blood count showed 80 per cent hemoglobin, 4,740,000 red cells and 10,400 white cells. A differential count showed 41 per cent polymorphonuclears, 35 per cent small lymphocytes, 8 per cent monocytes, 1 per cent eosinophils and 15 per cent stab cells. The Mantoux test with 0.1 cc. of a 1:1,000 solution injected intradermally was negative. The sedimentation rate was 48 mm. in sixty minutes. Kolmer and Kahn tests were

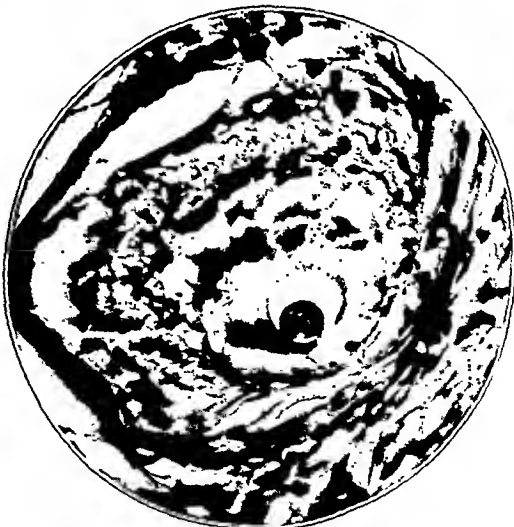


Fig. 3.—Coccidioides immitis in a giant cell.



Fig. 1.—Single coccidioidal lesion in right lung.

four months, nausea and vomiting for two months and an unsteady gait for one month. The family history was not important. She had measles at 2 years and a tonsillectomy at 3.

The headaches had been periodic and mostly frontal. The vomiting had been frequent, usually in the mornings. The

1. Norris, G. W.: *Am. J. M. Sc.* 128: 649, 1904.
Horn, Henry, and Saphir, Otto: *Am. Rev. Tuberc.* 32: 492 (Nov.) 1935.
Cited by Horn and Saphir:
Raviart, G.: *Arch. de méd. expér. et d'anat. path.* 18: 141, 1906.
Valentine, G.: *Thesis, Paris*, 1894, No. 46.
Willigk, G. A.: *Vrtilschr. f. d. prakt. Heilk.* 44: 86, 1854.
2. Gouley, B. A.; Bellet, Samuel, and McMillan, T. M.: *Tuberculosis of the Myocardium*, *Arch. Int. Med.* 51: 244 (Jan.) 1933.

negative. Examination of the urine and stools gave negative results. A tentative diagnosis of cerebellar tumor, probably a medulloblastoma, was made and the patient referred to Dr. C. W. Rand, Los Angeles.

An exploratory operation by Dr. Rand disclosed a large cyst in the cisterna magna, with thickened arachnoid. Dr. Rand stated that the picture was unusual. The posterior wall of the cisterna magna, which is ordinarily covered by arachnoid

of a spider web transparency, was covered by a white opaque membrane about 1 or 2 mm. thick. This entirely dammed back the spinal fluid and caused a large cyst.

Microscopic studies of the membrane by Dr. C. M. Hyland revealed lymphoid infiltration and numerous concentric masses of cells. The periphery of these concentric masses was composed of dense, almost hyalinized, fibrous tissue, and the center was occupied by a large foreign body giant cell or a group of epithelioid cells. Within the body of the giant cells and in the crevices of some of the epithelioid cells there were spherical bodies with a double contoured highly refractile capsule. The diagnosis was coccidioidal granuloma.

The child was somewhat better for several weeks after the operation. As sulfanilamide has been suggested as a possible cure for this condition, rather large doses were given subcutaneously and intravenously in 0.8 per cent physiologic solution of sodium chloride. However, the course of the disease continued to be hopeless, and the child died December 7.

An autopsy performed by Dr. Ludwig Lindberg revealed a recurrence of the membranous lesion at the base of the brain and the formation of fibrous adhesions to the brain substance. The cerebellum had been pushed down into the area surrounding the foramen magnum. The lower portion of the upper lobe of the right lung contained a small hard nodule consisting of caseous material and simulating a Ghon tubercle. This single, sharply circumscribed nodule, 1.5 cm. in diameter, was the only lesion in the lungs. Sections showed coccidioidal tubercles and *Coccidioides immitis*.

COMMENT

Coccidioidal granuloma was first described in this country by Rixford in 1895. Afterward many reports appeared, chiefly from California. Recently cases have been reported from other portions of the United States. In California, especially in the San Joaquin Valley, the disease is well known. Dickson¹ described a condition called valley fever and characterized by a cold or bronchopneumonia, often with a relatively high fever and the appearance of painful erythema nodosum. This he said was the primary acute infection with coccidioides. Many writers have stressed the similarity of the disease to tuberculosis. In this instance the similarity is consistent. The disease is rare in children. California² reported that since the initial case, in 1895, to July 1, 1936, a total of 450 cases with 224 deaths had occurred. Twenty patients were under 4 years of age and thirty-four under 10. Duckett and Fredeen³ reported an instance in which coccidioides infection in a boy aged 5 years probably precipitated hydrocephalus and at autopsy extensive meningeal involvement was seen. (This instance would bring the reported total to twenty-two patients under 5.) Rand⁴ reported two cases in which the condition in adults simulated tumor of the spinal cord. In one, operation proved beneficial. The treatment is unsatisfactory. Tomlinson and Bancroft⁵ expressed the opinion that the use of antimony and potassium tartrate in addition to roentgen therapy is of value. Jacobson⁶ emphasized colloidal copper. Surgical excision may prevent spread of the condition.

One wonders why this child should have had a coccidioidal infection. She had lived her entire life in Tucson, Ariz., and her case is the first reported in which the disease originated in this locality. It is of interest that her father maintains a cleaning and pressing establishment and the child frequently rode with him in the delivery wagon, using dirty clothes as a cushion. Mycotic diseases are said to be more common among workers engaged in this type of work.

4 East Congress Street.

1. Dickson, Ernest C.: "Valley Fever" of the San Joaquin Valley and Fungus Coccidioides, California & West. Med. 47:151 (Sept.) 1937.
2. California State Department of Public Health: Coccidioidal Granuloma in California in 1934-1935, California & West. Med. 46:282 (April) 1937.

3. Duckett, Thomas G., and Fredeen, Robert C.: Coccidioidal Granuloma, J. Kansas M. Soc. 38:111 (March) 1936.

4. Rand, Carl W.: Coccidioidal Granuloma: Report of Two Cases Simulating Tumor of the Spinal Cord, Arch. Neurol. & Psychiat. 23:502-511 (March) 1930.

5. Tomlinson, C. C., and Bancroft, Paul: Granuloma Coccidioides: Further Observations on the Use of Antimony and Potassium Tartrate and the Roentgen Rays in Treatment, J. A. M. A. 102:36 (Jan. 6) 1934.

6. Jacobson, H. P.: Coccidioidal Granuloma, California & West. Med. 29:392-396 (Dec.) 1928.

Special Article

CONFERENCES ON THERAPY

USE OF DRUGS IN THE TREATMENT OF ALLERGIC CONDITIONS

NOTE.—These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital, with the collaboration of other departments. The questions and discussions involve participation by members of the staff of the college and hospital, students and visitors.

DR. EUGENE F. DU BOIS: The problems connected with the treatment of allergic conditions are increasing in importance. The question arises whether the advances in therapy have kept pace with the increase in the number of patients. Dr. Gold will start the discussion with a brief outline of the objectives in the treatment of asthma and other allergic conditions.

DR. HARRY GOLD: The rational use of drugs in the treatment of allergic conditions requires that we not merely look at these conditions as clinical entities but focus our attention on the physiologic disturbances which are responsible for the symptoms. At least eight major abnormalities are encountered in cases of bronchial asthma: (1) spasm of the bronchial muscle, (2) hypersecretion of the glands, (3) capillary dilatation, (4) increased permeability of the capillary wall, (5) edema of the mucous membrane and possibly also of the muscle of the bronchi and the bronchioles in the more advanced stages, (6) diminished elasticity of the lungs, (7) emotional unrest, anxiety and nervousness, and (8) asphyxia.

Not all cases present these factors in the same proportions, and it has been doubted whether some of these factors are ever present in some cases. There is a view that bronchial spasm plays but a little role in human bronchial asthma, although in the anaphylaxis of the guinea pig that appears to be the chief factor. The consensus, however, is, I believe, that all these factors, or at least most of them, play some role in most cases of bronchial asthma.

The result of most of these factors is, first, to impair the movement of air through the pulmonary tree and, second, to interfere with the diffusion of gases.

The innervation of the bronchial tree is a matter of some importance and is probably well known to you. Both the vagus and the sympathetic exercise control. The vagus supplies the constrictor fibers to the bronchial muscles and also the secretory fibers to the glands, and the sympathetic supplies fibers which when stimulated relax the smooth muscle of the bronchioles. The sympathetic also supplies the vasoconstrictor fibers and possibly some vasodilator fibers to the blood vessels of the bronchi.

Here is a list of the drugs by classes that are generally employed in the treatment of patients with bronchial asthma as well as other forms of allergic disorders:

1. Epinephrine, ephedrine and other related amines, generally in the form of their salt.
2. Atropine; stramonium.
3. Theophylline preparations, papaverine, nitrites.
4. Calcium salts.

5. Barbitol and barbitol derivatives, morphine, codeine.
6. Helium.
7. Iodides.
8. Iodized oil.
9. Anesthetics: ether, avertin with amylene hydrate.

The sympathomimetic amines like epinephrine, ephedrine and other related compounds produce effects similar to stimulation of the sympathetics, causing relaxation of the bronchial musculature and constriction of the blood vessels. The members of the belladonna group, atropine and stramonium, block the parasympathetics and thereby reduce the secretions and relax bronchial muscle. Among the agents which act directly on smooth muscle to cause relaxation are theophylline, caffeine, papaverine and the nitrites. The calcium salts reduce capillary permeability. The actions of the general depressants, such as the barbitol derivatives, morphine and codeine, are well known. How some of these substances are best put to use in the treatment of bronchial asthma and other allergic conditions will be considered this morning. In the course of the discussions we hope that it may be possible to bring out some of the details of the pharmacologic actions of these compounds.

DR. HORACE S. BALDWIN: Bronchial asthma is primarily a functional disorder involving the bronchial tree. When the asthmatic paroxysm is over, the bronchi and lungs return to their previous state. With continued attacks, however, the asthmatic state becomes associated with definite pathologic changes such as emphysema, chronic bronchitis, bronchiectasis, pulmonary arterial hypertension and failure of the right side of the heart. I emphasize these points at the start because, whereas drugs in the treatment of bronchial asthma may for a time give spectacular relief, it is of paramount importance that the fundamental background of sensitivities, respiratory infection and neurogenic factors be carefully studied and adequately handled so that the use of drugs may not be necessary.

From the standpoint of the clinical use of the drugs which Dr. Gold has mentioned, I will proceed according to the outline he gave. Epinephrine, of course, is the drug that gives the most dramatic effect in asthma. It has no effect when given by mouth. When given subcutaneously its effect appears very quickly. I might state here that epinephrine does not usually need to be given in large doses. A dose of 0.25 or 0.5 cc. of a 1:1,000 solution of epinephrine hydrochloride is usually adequate. A dose of 1 cc. may often cause considerable tachycardia and nervousness, although it may not affect the asthmatic state any more favorably than 0.25 cc. The drug may be given three or four times a day, sometimes more often if necessary. Solution of epinephrine hydrochloride 1:100 may be given by a specially devised vaporizer and inhaled into the trachea. It has to some extent supplanted the administration of solution of epinephrine hydrochloride by hypodermic injection. It is very useful, but we have to beware of the possibility that so much epinephrine taken intratracheally may cause irritation.

DR. HENRY B. RICHARDSON: How long do they inhale it?

DR. BALDWIN: They inhale it until they get a therapeutic effect, which is usually a matter of fifteen or twenty seconds.

In the course of time epinephrine may lose its effect. That presents a problem in the treatment of status asthmaticus. I will attempt to touch on it later in the course of my brief remarks.

Ephedrine produces several effects similar to those of epinephrine, and it is potent when given by mouth. The dose of ephedrine is from 0.025 to 0.050 Gm. The effect of ephedrine is less intense and less dramatic than that of epinephrine, but it is very useful in the milder cases of asthma. It may also cause tachycardia, nervousness, insomnia and bladder disturbances. In view of this, ephedrine is best given in combination with a sedative, such as phenobarbital or amytal. A useful combination is ephedrine, 0.025 Gm. and phenobarbital 0.03 Gm. In that way the nervous effects of the ephedrine are reduced, whereas the therapeutic effect is not impaired.

We have not been greatly impressed with the value of atropine in asthma. I think the reason is that large doses are needed for therapeutic effect, and these cause disagreeable side effects, with dryness of the mouth, visual disturbances and other signs of atropine over dosage.

During the past year we have used theophyllin frequently and we have had some very interesting experiences with it. We give it in the form of aminophylline. We find that the ordinary oral doses of 0.1 to 0.2 Gm. are not very effective and also that its oral administration in adequate dosage is often complicated by gastrointestinal difficulties. However, when we give it intravenously in doses of from 0.25 to 0.5 Gm. the effects have been very satisfactory. Those individuals in whom epinephrine "fastness" has seemed to develop, those in whom epinephrine does not seem to be any longer effective, often secure satisfactory relief in an attack of asthma from aminophylline given intravenously.

The calcium salts have offered attractive theoretical possibilities for the treatment of allergic conditions but I have not been impressed with their value in asthma.

The barbitals find their greatest usefulness in the treatment of the nervous symptoms of the asthmatic patient and in the control of the nervousness caused by epinephrine or ephedrine.

Morphine deserves a very important place in a discussion of this sort. Morphine sulfate to an asthmatic patient in doses of one-eighth grain (0.008 Gm.) or even less by hypodermic injection may be useful. However, it is a very dangerous drug for a good many asthmatic patients. Morphine stimulates the parasympathetic system, and some asthmatic patients are apparently more easily so stimulated by morphine than others. A good many deaths have been due to the indiscriminate use of morphine. The effect of morphine, besides that on the parasympathetic, is to depress the respiratory center and to diminish the ciliary action of the tracheal and bronchial mucous membrane. With too frequent repetition of the dose the patient may drown in his own secretion. I want to emphasize the extreme caution that should be used with the administration of morphine in bronchial asthma. Added to that is the fact that morphine is a habit-producing drug, a real source of danger in the asthmatic patient whose condition tends to recur over a period of years.

Helium offers interesting possibilities, particularly in the treatment of status asthmaticus. A mixture of

nt 75 parts of helium and 25 parts of oxygen is ter than air, has a greater inherent motility and can be breathed with much less effort. It has been used a at deal in the Medical Center uptown by Dr. Barach. o developed it. It is particularly applicable in some the very severe cases of status asthmaticus. In this spital, however, where we see a good many cases of ere status asthmaticus, we have seldom felt it neces- y to resort to this method of therapy, which is so pensive. We do however use oxygen alone, pref- ably in the tent, in a good many of these cases. Its e is very important and may be life saving.

Iodides are a very important part of our drug arma- entarium in the treatment of chronic bronchial asthma. ie bronchial secretion is very tenacious in a great any asthmatic patients. We believe that the favorable fluence of the iodides consists in making the mucus ore liquid and thus facilitating its expectoration. any proprietary preparations depend for their effect i the iodides and ephedrine.

The instillation of "iodized oils" is a therapeutic pro- dure for asthma that is fast losing ground. The more e see it used the more impressed we are with its angers, namely localized lipoid pneumonia and the ionic irritation and chronic infection set up about the oint where the iodide in oil remains in the bronchial ee.

The various anesthetics, ether and avertin with mylene hydrate are not being used very much. In ere cases of status asthmaticus rectal instillation of qual parts of ether and olive oil, 3 cc. per kilogram of ody weight, or anesthesia by means of avertin with mylene hydrate, sometimes interrupts a vicious cycle. heir mechanism of action is not understood.

Dr. Du Bois asked me to say something about urti- aria, angioneurotic edema and serum sickness. The rug treatment for urticaria and angioneurotic edema esolves itself into first aid measures while attempts re being made to ascertain the etiology. As to these irst aid measures, epinephrine may be given subcu- aneously in the doses I have indicated. In my experi- ence it is much more effective than ephedrine given by outh. Calcium therapy given intravenously and by outh may also be helpful, and when there is low free hydrochloric acid in the stomach the administration of the dilute acid is particularly indicated.

Local measures, such as lukewarm baths of sodium bicarbonate or cornstarch, are also used with benefit.

With regard to serum reactions, one has two phases to consider: The first phase is the matter of anaphy- lactic shock due to the injection of a foreign protein to which the patient may be sensitive. Here prevention is certainly much better than cure, and if adequate cutaneous testing and conjunctival testing are done with the particular serum before it is given, the immediate anaphylactic type of reaction may be avoided. In any case, when a foreign serum is given it is wise to have epinephrine handy in a hypodermic syringe and give it promptly should the symptoms of acute anaphylaxis occur. The second phase is the matter of serum sick- ness occurring usually within ten days to two weeks after the administration of a foreign serum. It is con- trolled in large measure by the same means that we use for the treatment of urticaria and angioneurotic edema. Epinephrine may be given subcutaneously. Ephedrine may be used. Certain calcium compounds may be given

intravenously and by mouth. Cool compresses to the itching swollen areas are much better than hot ones.

DR. DU BOIS: How about the use of acetylsalicylic acid?

DR. BALDWIN: Acetylsalicylic acid is a two-edged sword. In serum sickness acetylsalicylic acid may be very useful. On the other hand, you must remember that one of the most common causes of hives and angio- neurotic edema that we generally encounter is acetyl- salicylic acid. If you are going to give it in acute serum sickness it is well not to continue it very long, parti- cularly if the patient continues to have urticaria during its use.

TREATMENT OF ALLERGIC CONDITIONS IN CHILDREN

DR. VERNON W. LIPPARD: We do not use a large number of drugs in treating allergic conditions in chil- dren, and we do not use any that have not been mentioned.

One or two points with regard to dosage might be emphasized. In children we use doses of epinephrine which closely approximate those used in older persons. An effective dose of solution of epinephrine hydro- chloride in an infant is seldom less than 0.1 cc. and most children of school age require doses in the range of 0.3 cc. in order to bring about any therapeutic effect in an asthmatic attack. The ordinary dose of ephedrine sulfate in children is 0.025 Gm. and, as Dr. Baldwin mentioned, we often give a sedative either in the same prescription or concurrently. The use of sedatives might be stressed a little more in relation to children than it has been in adults. Many children become frightened during an asthmatic attack. The attack is likely to subside more quickly if one allays the emotional excitement by liberal use of phenobarbital or other seda- tives in conjunction with epinephrine or ephedrine preparations. We do not use atropine very often because we find, as Dr. Baldwin said, that we cannot give enough atropine to produce therapeutic effects without creating the undesirable toxic effects which accompany large doses.

Of course, we attempt to discover the exciting factors. Since a great many allergic disorders are attributed to hypersensitivity to foods, pollens or inhalants it is often possible to remove the causative factors rather than merely to treat the symptoms. The use of drugs may often be confined to the period when one is study- ing the patient and trying to discover the offending antigens.

DISCUSSION

DR. DU BOIS: The subject is open to general dis- cussion. I hope that you may have many questions relating to the pharmacology and the uses of these drugs, their mode of action, and the relative merits of the different compounds and methods.

DR. MCKEEN CATTELL: I wonder whether Dr. Bald- win can throw any light on the mechanism of the apparent increase in tolerance to epinephrine which sometimes follows the repeated use of the drug. I do not think we observe anything of that sort experi- mentally, although in the case of ephedrine there is an effect we note with repeated administration, which might correspond to something of the sort.

DR. BALDWIN: It is not easy to answer this question. I presume the reason patients become epinephrine

"fast" is that the tissues affected by the epinephrine have become exhausted with continued stimulation.

DR. CATTELL: The definite impression is that it is related to the repeated dosage rather than to any change in the condition of the disease itself?

DR. BALDWIN: The repeated dosage seems to me to be the important thing.

DR. DU BOIS: If bronchial spasm is not an important factor in man, how would this act then?

DR. BALDWIN: Dr. Gold indicated that some observers think that bronchial spasm is not an important factor in the human being. On the other hand edema might well be affected by epinephrine without the effect on the bronchial musculature through the constrictive effect on the bronchial vascular bed.

DR. JANET TRAVELL: You spoke about giving solutions of epinephrine hydrochloride subcutaneously. We know that epinephrine is very poorly absorbed from the subcutaneous tissues, and I wondered whether you ever give the solution intramuscularly.

DR. BALDWIN: We do not usually give solution of epinephrine hydrochloride intramuscularly. We have been under the impression that the intramuscular injection gives too rapid absorption. In cases in which we had given it intramuscularly there occurred severe throbbing, headache and extreme nervousness, which made us reluctant to repeat it. However, I might say that in the treatment of status asthmaticus we do use very small amounts of epinephrine in a solution of dextrose by intravenous infusion, and it seems to be very effective used that way.

DR. GOLD: I wonder whether I may say something about these patients who become tolerant to epinephrine in the course of time and develop status asthmaticus in which epinephrine is no longer useful. When their protracted attack of asthma subsides, they sometimes regain their responsiveness to epinephrine, do they not?

DR. BALDWIN: Yes.

DR. GOLD: Wouldn't this argue against the view that their temporary failure to respond is due to frequent use of epinephrine? Then I should like to ask whether the tolerance may not really be due to the fact that the mechanism of the attack of asthma is different in the late stages of asthma when epinephrine is no longer effective from what it is in the early stages. By way of illustration, if in the early stages it is mainly a matter of bronchial spasm we can overcome it readily, but if in the late stages it becomes more a matter of edema, then epinephrine might readily fail to overcome it. If in the late stages it becomes more a matter of paralysis of the capillary wall, epinephrine would then have as little effect as it has in angioneurotic edema, in which epinephrine is not as effective as it is in asthma.

DR. BALDWIN: This may be true.

DR. GOLD: A change in the disease itself rather than a development of tolerance as the result of the protracted use of the drug would be the formulation that I would suggest to explain the poor response to epinephrine in the late stages of asthma.

DR. TRAVELL: I was going to ask whether there were any other means of prolonging the action of epinephrine besides putting it up in an oily solution?

DR. DU BOIS: Such as rubbing the spot?

DR. BALDWIN: Rubbing of the injected area in the arm with most asthmatic patients is really not very

effective. We find it rather a rarity when a patient comes in and says "I rubbed this area after I gave myself the injection and it worked." It is disappointing that it does not work more often.

DR. GOLD: The proposers claim that it works in about 20 per cent of the cases.

DR. BALDWIN: I would say that is liberal.

DR. DU BOIS: I have been disappointed in the method, hoping to demonstrate dramatic effects. I have almost always failed.

DR. ALICE BERNHEIM: Dr. Abramson at Mount Sinai has developed iontophoresis. He finds epinephrine used in that way very effective because that too prolongs the absorption.

DR. GOLD: Dr. Baldwin has spoken about slowing up the absorption of epinephrine by oily solutions in order to prolong the epinephrine action. Are we seeking to delay the absorption or exactly the opposite? When we give a dose of epinephrine subcutaneously for the treatment of asthma we can get effects within two or three minutes, which means that the drug enters the blood stream rapidly. Then, however, a marked local vasoconstriction takes place, which delays or prevents further absorption. An extract of the area of the skin made several hours later by Luckhardt and Koppányi still contained epinephrine. The problem that needs to be solved is not one of delaying absorption but of accelerating it. Epinephrine delays its own absorption too much. I can readily see how an oily medium might protect the local vessels against the strong constrictor action and in that way prolong absorption. There are other ways in which that might be done. If one irritates the tissues and produces dilatation of the capillaries or paralysis, then epinephrine may continue to be absorbed over a longer period of time. I wonder whether an irritant in the solution of epinephrine might not be a useful expedient. Somewhat more than the 0.1 per cent sodium sulfite used as a preservative might serve the purpose.

DR. LIPPARD: Will Dr. Baldwin please discuss his experience with x-ray therapy in asthma?

DR. BALDWIN: It is a comparatively new method, and it is much too early to attempt a final evaluation. There are some cases of asthma that are helped by exposure of the chest to x-rays, and we usually combine it with irradiation of the sinuses. Some very dramatic results are obtained, and it has seemed to me that the cases helped most often have been the chronic infectious types of asthma with considerable wheezy bronchitis. In others it appears to be of no value. At present we have no definite knowledge of what its effect is on the tissues histologically or what the results will be after five years or more.

DR. WALTER MODELL: If one wants to avoid an increase in blood pressure in the asthmatic patient with hypertension would one use epinephrine or ephedrine?

DR. BALDWIN: In my experience an asthmatic patient with hypertension having an acute attack of asthma may be given epinephrine in small doses. It produces the usual relief of the acute asthmatic attack and the blood pressure is very apt to fall after its administration rather than rise. My preference is to use aminophylline in these cases.

DR. MODELL: How would that compare with the action of ephedrine in the same situation?

DR. BALDWIN: The effect of ephedrine is, of course, slower, but I have not been impressed that the use of ephedrine or epinephrine is harmful to asthmatic patients with hypertension. I would be interested to know what Dr. Gold thinks about that.

DR. GOLD: I cannot say whether or not they would be harmful, but if I had a choice I should use epinephrine instead of ephedrine for the attack of asthma in which hypertension is also a problem. The reason is that ephedrine is rapidly absorbed and epinephrine poorly absorbed. A small part of the dose of epinephrine enters the circulation very quickly, but too little to raise the blood pressure. One way to reduce the vasopressor effect of ephedrine is to give it with epinephrine, because the epinephrine will delay the absorption of the ephedrine.

STUDENT: How do calcium compounds act in relieving the asthmatic attack?

DR. GOLD: I can just state what calcium does that might conceivably be beneficial. It relaxes smooth muscle. This may explain how it relieves renal colic and lead colic. It reduces permeability of capillaries. It also reduces neuromuscular irritability, which is one of the problems in bronchial asthma. It is possible that those three actions would occasionally prove valuable in bronchial asthma.

DR. DU BOIS: If given by mouth, would there be enough calcium to do that?

DR. GOLD: No, it would have to be given by vein, and then the problem of intravenous calcium is one that ought to be considered with circumspection. There is considerable danger in rapid intravenous injection of calcium. A gram or a gram and a half of calcium gluconate in about a 10 per cent solution, injected in a period of from five to ten minutes, not more quickly, may be used.

MR. T. P. ALMY (Student): Would any one comment on or criticize the use of pitressin and a low sodium diet in the treatment of bronchial asthma?

DR. BALDWIN: I have not had any experience with it.

DR. DU BOIS: Suppose you tell us about it.

MR. ALMY: Cook and Stoesser reported in June 1938 six cases in children with bronchial asthma whom they treated with pitressin, a low sodium diet and a high water intake. The use of pitressin was continued for about thirty-six hours. In most cases they obtained some relief, and in some cases it was complete. In one instance the symptoms of asthma returned after the ingestion of 4 Gm. of sodium chloride.

DR. DU BOIS: Are there any comments on that work?

DR. LIPPARD: This work was based on the original observation that diets high in salt increased asthmatic symptoms and that diets low in salt or artificial fever resulted in a decrease in asthma. Cook and Stoesser also studied the effect of potassium chloride, the ingestion of which failed to increase the severity of asthmatic attacks and in some instances seemed to bring about some alleviation. The effects of alterations in electrolyte balance cannot be considered, however, without also considering the water metabolism. It has been shown that administration of pitressin causes not only retention of body water but also an increase in output of sodium chloride. Since the administration of

pitressin was effective in decreasing the frequency of asthmatic attacks, despite retention of water, it appears that the loss of sodium chloride is the essential factor.

These studies are interesting from the theoretical point of view but the methods have not been used practically in a large group of patients. They should be of greatest value in diminishing the frequency and duration of attacks rather than in alleviating acute symptoms.

DR. BALDWIN: May I say something more about the use of these drugs we have discussed. We cannot emphasize too strongly that their use constitutes only a part of the treatment of the asthmatic. Those who see asthmatic patients frequently are greatly impressed with the importance of therapeutic measures other than drugs. If you go to the home of a patient who is having an attack of asthma, you should be on the alert for such factors as a feather pillow, a dog sitting on the bed, the cosmetics in use or a sinus infection complicating the asthma. The removal of those factors gives results often more dramatic than the administration of drugs.

DR. LIPPARD: For the benefit of students who have not seen many of these patients, the use of asthma powders should be mentioned. Seldom does one see a child with asthma who has not had some proprietary asthma powder burned in his room. I have been rather impressed with the possibility that the intensity of the attack may be increased by the use of these powders and have never been convinced that they produce relief. The air in a small room in which powders have been burned becomes practically suffocative after a few hours. I do not see how a healthy person could breathe very easily in such an atmosphere.

DR. ADE T. MILHORAT: I was wondering whether Dr. Lippard could tell us how he proceeds to give serum to a child who is sensitive. What precautions does he take?

DR. LIPPARD: Serum should be administered only with great caution to children who have histories of asthmatic attacks associated with exposure to animal danders or previous injections of serum. Most fatal reactions have occurred in this group. Both ocular and intracutaneous tests with diluted serum should be performed. If reactions are observed, a small amount of diluted serum may be given subcutaneously in the arm and absorption controlled if necessary by means of a tourniquet. If no generalized reaction occurs within thirty minutes, the remainder of the serum may be given slowly by intravenous injection, preferably diluted 1:10. Injection should be interrupted and epinephrine administered at the first sign of a generalized reaction.

DR. GOLD: I should like to ask one question of Dr. Baldwin: whether he feels quite convinced that potassium iodide would be more effective than a strong solution of sodium chloride in bronchial asthma. Is not the expectorant effect of the iodide merely a non-specific reflex effect of the strong salt?

DR. BALDWIN: I have never used a strong solution of sodium chloride in the treatment of bronchial asthma but I am convinced that either sodium iodide or potassium iodide is a very useful drug in the treatment of chronic bronchial asthma.

DR. GOLD: I do not doubt its being useful. I venture the suspicion, however, that a strong solution of ordinary table salt would be equally effective.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE BOARD OF TRUSTEES REQUESTED THE COUNCIL ON PHARMACY AND CHEMISTRY TO MAKE A STUDY OF THE PROMISCUOUS USE OF BARBITURATES, PARTICULARLY WITH REFERENCE TO THE DANGEROUS USE OF THESE PRODUCTS BY THE PUBLIC. THE COUNCIL INVITED DR. W. E. HAMBOURGER OF WESTERN RESERVE UNIVERSITY TO DRAW UP A REPORT. THE COUNCIL CONSIDERED THIS REPORT AND AUTHORIZED ITS PUBLICATION, EXPRESSING APPRECIATION OF DR. HAMBOURGER'S EXCELLENT WORK. THIS REPORT WILL BE FOLLOWED BY ANOTHER ONE AT A LATER DATE.

PAUL NICHOLAS LEECH, Secretary.

A STUDY OF THE PROMISCUOUS USE OF THE BARBITURATES

THEIR USE IN SUICIDES

W. E. HAMBOURGER, PH.D.

CLEVELAND

At a meeting of the American Medical Association in June 1937 a resolution was introduced on the "Evils from Promiscuous Use of Barbituric Acid and Derivative Drugs," in which was included the following statement: "The evils of these drugs include habit formations, toxic cumulative action, their substitution for alcoholic beverages for drunken episodes, their use for successful as well as unsuccessful suicidal attempts, their improper use being a recognized causative factor in many motor accidents and their improper use being a recognized etiologic factor in some criminal assaults."

The widespread use of barbiturates is illustrated in table 1 by statistics of the manufacture and sale of the drugs in this country for 1936 compiled by the United States Tariff Commission. These figures were made available through President H. G. Bertram of the Winthrop Chemical Company, in whose opinion, because of the high United States duty, "sales" may be considered practically equivalent to consumption in the United States.

If the average therapeutic hypnotic dose for all the drugs in table 1 is taken as $1\frac{1}{2}$ grains (0.1 Gm.), then the United States sales represent more than 810,000,000 doses a year, which is more than 2,200,000 doses a day. A large part of these drugs undoubtedly were used under medical supervision, often in much larger dosage (for instance, by psychotic patients and for basal anesthesia). What part was used without prescription or medical supervision is difficult to evaluate.

The problem of investigating the promiscuous use of the barbiturates divides itself conveniently into four headings: (1) the incidence of successful suicides by barbiturates, (2) the incidence of nonfatal poisoning, (3) chronic usage and (4) involvement in motor accidents and criminal offenses.

The present report is concerned with the incidence of accomplished suicides. A study of the other aspects is being made and will be reported on at a later date.

SOURCES OF INFORMATION

The data considered in this report come from two general sources: (1) medical literature and (2) vital statistics. The latter were obtained from United States census reports and from data solicited of the Metropolitan Life Insurance Company and medical examiners and coroners of several large cities.

LITERATURE ON SUICIDES AND ACUTE POISONING

The available medical literature on the barbiturates, largely as listed in the *Quarterly Cumulative Index Medicus*, has been examined from January 1926 to July 1938, and the papers significant to the present topic are discussed later. As a rule, data on intentional and unintentional deaths are found intermingled.

The incidence of acute poisoning by barbiturates has increased markedly in recent years. Gillespie¹ in a thorough search of the literature collected 157 reports of published deaths up to the end of 1932, of which forty-four occurred since 1927. The deaths were divided as follows: Fifty-seven were definitely suicidal, thirteen more were questionably suicidal, nine deaths (including three suicides) occurred in addicts, and seven more (including two questionable suicides) were in suspected addicts.

Searlett and MacNab² found a total of 408 deaths in the literature up to the end of 1934. This total represented 247 deaths in the two calendar years 1933-1934 (a discrepancy of four deaths as compared with Gillespie's figures). The great majority of the fatalities in their series were due to suicidal intent, indicating an increasing tendency in this direction from 1932 to 1934, since only one third of Gillespie's deaths were suicides.

In the Registrar-General's statistics for 1931 in England there were 5,149 suicides, of which only thirteen (0.26 per cent) were by barbiturates.³

Lowy,⁴ analyzing 2,046 replies from hospitals in the United States to questionnaires covering the decade 1924-1934, reported 1,185 cases of barbiturate poisoning with 124 deaths. This includes only the three drugs barbital, phenobarbital and allonal. Some deaths were probably due to the aminopyrine in the allonal. These data may be compared with parallel figures of 139 cases of poisoning and seventeen fatalities by coal tar analgesics (antipyrine, acetophenetidin and acetanilid) and seventy-four cases of poisoning with four fatalities for

TABLE 1.—Manufacture and Sale of Barbiturates in United States for 1936

Drug	Manufacture		Sales	
	Pounds*	Grains†	Pounds*	Grains†
Coal tar barbiturates (essentially phenobarbital)	107,630	755,000,000	88,617	680,000,000
Non-coal tar barbiturates (essentially barbital, amytal, pentobarbital, and so on)	123,517	865,000,000	75,571	629,000,000
Totals	231,147	1,620,000,000	174,188	1,219,000,000

* Weights are avoirdupois; 1 pound = 7,000 grains.

† Value in grains is only approximate.

acetylsalicylic acid. The hospitals had about 2,500,000 admissions a year or 25,000,000 for the decade, so the death rates were therefore approximately as indicated in table 2.

In Germany, from the end of 1918 to April 1936, Siebert⁴ reported a total of 2,894 cases of suicide by solid, liquid and gaseous poisons which he had compiled from publications. Of these, 1,071 were due to barbituric acid derivatives. This is second only to illuminat-

1. Gillespie, R. D.: On Alleged Dangers of Barbiturates, *Lancet* 1: 337-345 (Feb. 17) 1934.

2. Searlett, E. P.; and MacNab, D. S.: Poisoning from Phenobarbital, with Report of Fatal Case and Review of Fatalities Previously Reported, *Canad. M. A. J.* 33: 635-641 (Dec.) 1935.

3. Lowy, Otto: Comparative Study of Habitual Use of Barbiturates and Coal Tar Derivatives as Furnished by Reports from Various Hospitals Throughout the U. S., *Canad. M. A. J.* 24: 638-641 (Dec.) 1934.

4. Siebert, H.: Selbstmorde durch Gift in Deutschland seit Kriegsende, *Sammlung von Vergiftungsfällen* 7: C73-74, 1936.

ing gas, with 1,196 deaths. The other hypnotics together account for only 109 successful suicides. Unsuccessful suicides were not recorded. Presumably they exceed the successful cases in number. The actual number of suicides undoubtedly far exceeds the number reported in the literature. The percentage of suicides by barbiturates in Germany is much greater than the

TABLE 2.—Death Rates for Various Drugs

Drug	Deaths per Million Admissions*
Barbiturates	5.00
Coal tar derivatives ..	0.64
Acetaminophen	0.16

* In Lowy's conclusions, these figures are given tenfold too high. The figures given here are from part of his summary table and have been verified by direct correspondence with him.

corresponding incidence in the United States, at least until recent years. This is presumably because barbiturates were introduced in Germany several years before their introduction in American medicine, and the "fashion" or "suicide cycle" has only recently turned to barbiturates as a means of self destruction in the United States.

VITAL STATISTICS ON SUICIDES

Those vital statistics which have been considered in this investigation list deaths due to asphyxiant gases (carbon monoxide, automobile exhaust, artificial illuminating gas and the like) separately from deaths due to drugs and poisons, liquid and solid. Since very few data on gases are available, the figures given here for suicides due to poisons refer only to liquid and solid poisons and do not include asphyxiant gases, except as specifically noted.

*U. S. Bureau of the Census.*⁵—The latest federal report contains statistics for the five year period 1932-1936 inclusive (table 3 A). During this interval there were 634 successful suicides by all barbiturates. This may be compared with 27,978 suicides by all poisons, solid, liquid and gaseous (of which 12,892 were due to gases alone). Deaths from all forms of suicide including the foregoing, numbered 96,256. Suicides by all barbiturates for the five year period, therefore, amounted to 4.20 per cent of all solid and liquid drugs (excluding gases), to 4.92 per cent as compared with suicides by poisonous gases only and to 2.26 per cent of all drugs and poisons, gaseous as well as liquid and solid. Barbiturate suicides constitute 0.66 per cent of suicides by all means, drug and otherwise.

The data for this five year period indicate a definite increase in the incidence of suicides by the barbiturates in the more recent years, while the incidence of suicides by poisonous gases has slightly declined. The frequency of suicides by the barbiturates, as compared to suicides from all causes, has more than doubled from 0.42 per cent in 1932 to 0.93 per cent in 1938, to make the five year average 0.66 per cent. Chart 1 shows a similar upward trend for barbiturates as compared to all solid and liquid poisons.

For each year there are listed a number of "accidental" barbiturate deaths almost identical with the number of suicidal deaths. Martland⁶ has pointed out

that "... a considerable number of undoubted suicides often signed out as 'accidental deaths due to overdose of sleeping powders, etc.' will be found classified under accidental deaths by poison." Such inaccuracies, if eliminated, would nearly double the percentage of suicides by barbiturates. The figures already given, therefore, must be considered as minimum values.

There were 171 suicides due to barbiturates in the United States in the year 1936, according to the official U. S. census⁵ figures which represent the entire population of the states, District of Columbia, Hawaii, Puerto Rico and the Virgin Islands, an estimated total of 128,500,000. There were also 165 additional deaths due to barbiturates listed under the heading "Accidental, Other or Unidentified." If one assumes that a considerable number of these are suicides, as Martland⁶ has suggested, then the probable true number of suicidal deaths caused by barbiturates in 1936 was close to 300.

Judging from the present increasing trend of suicides by the barbiturates, the probable number of suicidal deaths by this method in the United States in 1937 (census data not yet available) may have approached or even exceeded 400.

*The Metropolitan Life Insurance Company.*⁷—Claims were paid for 4,658 suicides among weekly premium-paying industrial policyholders in the three years 1935 to 1937 inclusive (table 3 B). Of these 680, or 14.6 per cent, were due to drugs and poisons. A barbiturate was specified as the drug used in forty-one cases, representing 6 per cent of all suicides by drugs and 0.88 per cent of suicides from all causes. Specifically barbiturals was the worst offender, causing eighteen deaths (44 per cent). Next in order came phenobarbital with ten deaths (24.4 per cent), amytal with eight deaths (19.5

TABLE 3.—Classification of Suicides

Location	Barbiturate rates No.	All Poisons*		All Methods†	
		No.	% B‡	No.	% B‡
A U S national census (1932-1936 incl)	634	15,096	4.2	96,256	0.66
B Metropolitan Life Insurance Company; weekly premium paying industrial policyholders for 1935, 1936 and 1937 (national distribution)	41	680	6.0	4,658	0.88
C Large urban areas: (1932-1937 incl)					
Suffolk County (Boston), Mass	34	203	16.7	1,272	2.67
Cook County (Chicago), Ill	123	1,197	10.7	6,523	1.96
Borough of Manhattan, New York	126	1,477	8.5	13,401	1.10
Essex County (Newark), N. J.	15	183	8.2	1,433	1.28
Cuyahoga County (Cleveland), Ohio	32	474	6.7	2,101	1.52
City and county of San Francisco	19	524	3.6	2,365	0.80
City of St. Louis	9	435	2.0	1,870	0.48
Totals for urban areas	363	4,493	8.1	28,665	1.25

* Suicides by all drugs and poisons including barbiturates but excluding gases.

† Total suicides: suicides by all methods (shooting, hanging, drowning, as well as drugs and gases)

‡ Percentage of barbiturates as compared to "all poisons" or "all methods"

per cent) and allonal with three deaths (7.3 per cent; some of these may conceivably have been due to aminopyrine), and neonol and ortal each with one death (2.4 per cent).

During the same three year period there were 332 claims for deaths due to accidental poisoning. Of these, twenty-seven deaths (18 per cent) were caused by

⁵ Department of Commerce, Bureau of the Census, Vital Statistics, Special Reports, Number of Deaths in the U. S. 1932-1936, 5: 107-108 (June 4) 1938.

⁶ Martland, H. S., chief medical examiner of Essex County (Newark), N. J. Private communication to the American Medical Association.

⁷ Dublin, L. I., third vice president and statistician of the Metropolitan Life Insurance Company. Private communication to the American Medical Association.

barbiturates; specifically, phenobarbital eleven deaths (40.8 per cent), barbital nine deaths (33.3 per cent), amytal five deaths (18.5 per cent) and allonal and neonal each one death (3.7 per cent).

Medical Examiners and Coroners.—We are indebted to the following thirteen local officers who replied to the questionnaire on the incidence of suicides by barbiturates:

S. R. Gerber, M.D., coroner, Cuyahoga County (Cleveland), Ohio.

T. A. Gonzales, M.D., chief medical examiner, Borough of Manhattan, New York.

T. B. W. Leland, M.D., coroner, city and county of San Francisco.

H. S. Martland, M.D., chief medical examiner, Essex County (Newark), N. J.

L. R. Padberg, M.D., coroner, city of St. Louis.

F. J. Walsh, M.D., coroner, Cook County (Chicago), Ill.

W. H. Watters, M.D., Associate Medical Examiner, Suffolk County (Boston), Mass.

W. J. Brickley, M.D., medical examiner, Northern Division Suffolk County (Boston).

N. H. Angell, magistrate, police court, Townson, Md.

E. DeRoma, M.D., medical examiner, Norfolk County (Walpole), Mass.

J. F. Golden, M.D., medical examiner, Norfolk County (Stoughton), Mass.

C. O. Nelson, M.D., medical examiner, Norfolk County (West Medway), Mass.

R. R. Ryan, M.D., medical examiner, Norfolk County (East Weymouth), Mass.

Of these thirteen replies, those of the first seven officials in the list are used in this analysis. One of the remaining six (Brickley) has been omitted because most of its data are included in another reply (Watters).

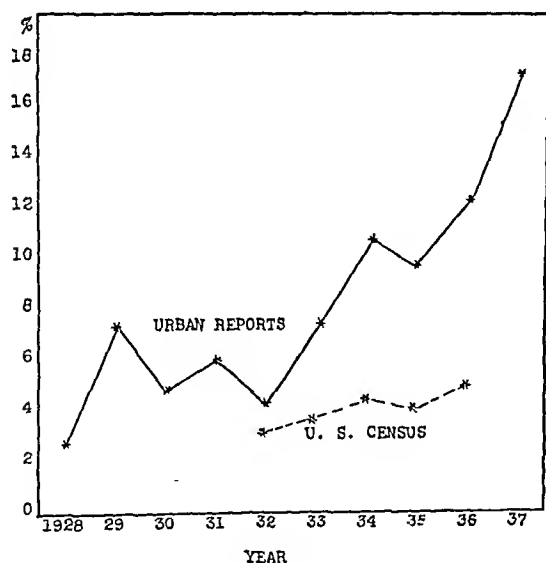


Chart 1.—Percentage incidence of suicides by barbiturates as compared to all solid and liquid poisons.

The last five in the list have been omitted because they do not contain any cases involving barbiturates.

The localities concerned in this report, it will be noted, are mainly the larger cities and their associated counties, namely Boston, Chicago, Cleveland, Newark, New York, St. Louis and San Francisco. The period covered is the decade 1928-1937. An additional report for the commonwealth of Massachusetts covering the two years 1936 and 1937 only was also received from

Dr. Watters. Although it increases the total number of suicides for those two years, it does not significantly alter the variously calculated percentage values for the urban localities.

A total of 28,965 suicides by all means (table 3C) was reported. Of these, 4,493 deaths were due to solid and liquid drugs and poisons, exclusive of poison

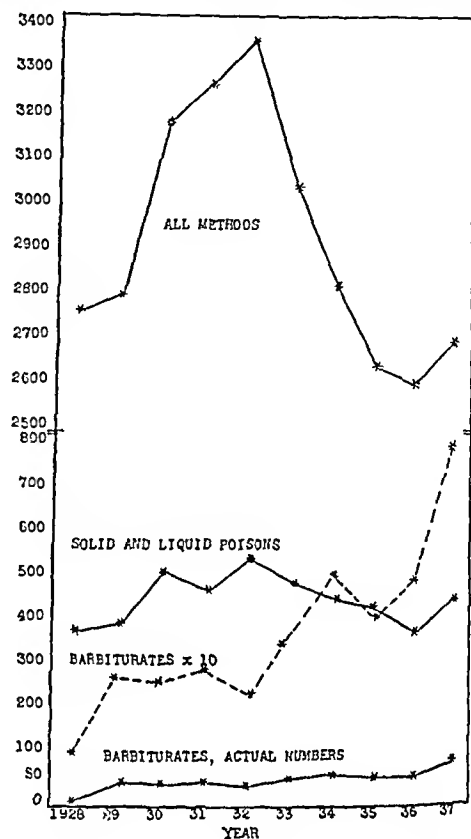


Chart 2.—Number of suicides in seven urban locations.

gases. There were 363 suicides by barbiturates, or 8.1 per cent of the suicides due to all poisons (except gases) and 1.25 per cent of the total suicides by all methods. The percentage of all suicides caused by barbiturates as obtained from this series (1.25 per cent) is nearly double the percentage found in the statistics previously mentioned of the Metropolitan Life Insurance Company (0.88 per cent) and the United States census (0.66 per cent). This indicates a higher incidence of suicide by barbiturates in the population of the larger cities than in the country population, since the last two figures include inhabitants of smaller city and country areas as well as of larger cities.

The percentage of suicides by barbiturates as compared with all poisons (excluding gases), varied widely in different localities from 16.7 per cent in Suffolk County (Boston) to 2 per cent in the municipality of St. Louis. The data for the various regions is given in table 3C in decreasing order of incidence of suicides by barbiturates.

Six reports, obtained from Boston, Chicago, Cleveland, Newark, New York and St. Louis, listed separately the individual barbituric acid derivatives involved in successful suicides. There was a total of 344 deaths attributable to the barbiturates in this group. Barbital was considered responsible for a majority of 209 deaths (60.7 per cent). Next in descending order came phenobarbital with fifty-six deaths (16.3 per cent), amytal

with twenty-four deaths (7 per cent), allonal with seven deaths (2 per cent), pentobarbital with four deaths (1.2 per cent), ipral, neonal, phanodorn and seconal with one death each (0.3 per cent), and forty deaths (11.6 per cent) due to unidentified or unclassified barbituric acid derivatives. It is plausible that the high incidence of suicides by barbital is somewhat exaggerated and that some of these deaths should also be classified as due to an unidentified barbiturate, since there is a tendency on the part of lay persons, official as well as civil, to call nearly all barbiturates "barbital."

An analysis of the yearly total for the seven large urban areas discloses an upward trend in the frequency of usage of barbiturates as compared both to the total number of suicides and to the number due to solid and liquid poisons. The upward slope of the rise has significantly increased since 1933. This is clearly shown in chart 1, in which the yearly percentage of suicides by the barbiturates as compared with all solid and liquid poisons is graphed. Chart 1 also shows a similar rise, but from a lower level, for the national incidence of suicides by barbiturates as obtained from the U. S. census figures. The two curves clearly indicate the greater use of barbiturates by urban populations than by the national population as a whole (country as well as city).

Another view of the upward trend of the barbiturates as a means of suicide compared to other methods is shown in chart 2. These curves represent in solid lines the actual yearly numbers of suicides by all methods (top curve), by all solid and liquid poisons (middle curve) and by barbiturates (bottom curve). To permit easier comparison, the broken line represents the number of suicides by barbiturates magnified ten times. To conserve space the top curve has been arbitrarily lowered, but the original magnitude of the vertical scale has been maintained. It will be observed that the contour of the curve for barbiturates shows a distinct upward course, increasing since 1933, while there has been a parallel decline since 1933 in both the curves for all poisons and for all methods.

SUMMARY

1. More than 1,200,000,000 grains of barbituric acid derivatives was sold in the United States in 1936.

2. The total number of suicidal deaths by the barbiturates in the United States in 1936 was probably close to 300. The probable number in 1937 may have approached or even exceeded 400.

3. For the five years 1932-1936 the national incidence of suicides by barbiturates represents 4.2 per cent of all poisons (except gases) and 0.66 per cent of all methods used for suicide.

4. In seven large cities and their associated counties, for the decade 1928-1937, barbiturates represent 8.1 per cent of suicides by all solid and liquid poisons and 1.25 per cent of all methods used for successfully committing suicide.

5. The incidence of suicides by barbiturates is nearly twice as high in large cities as in the country as a whole, ranging from 2 per cent in St. Louis up to 16.7 per cent in Boston.

6. The number of suicides by barbiturates has shown a definite upward trend during the past decade, especially marked since 1933, although the frequency of suicides by liquid and solid poisons and of total suicides have both declined since 1933.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED.

FRANKLIN C. BING, Secretary.

CLAPP'S CHOPPED MIXED GREENS

Manufacturer.—Harold H. Clapp, Inc., Rochester, N. Y.

Description.—Chopped mixed greens containing equal proportions of kale, lettuce and swiss chard. Slightly seasoned with salt.

Manufacture.—Fresh kale, lettuce and swiss chard are cleaned, mixed in equal quantities, and chopped to particles of the desired size. Definite amounts of salt are added, the mixture is heated in an atmosphere of steam and automatically filled into cans, sealed and heat processed.

Analysis (submitted by manufacturer).—Moisture 93.6%, total solids 6.4%, ash 1.0%, sodium chloride 0.3%, fat (ether extract) 0.4%, protein (N \times 6.25) 1.6%, reducing sugars as invert sugar 0.3%, sucrose (copper reduction method) 0.2%, crude fiber 0.6%, carbohydrates other than crude fiber (by difference) 2.8%, calcium (Ca) 0.078%, phosphorus (P) 0.036%, iron (Fe) 0.002%.

Calories.—0.21 per gram; 6 per ounce.

Vitamins.—The methods of preparation and processing are designed to retain the natural vitamin values to the highest degree consistent with adequate and safe heating processes. Contact of the product with air during processing is avoided as far as possible.

TRIX

Manufacturer.—New Foods, Incorporated, Chicago.

Description.—Puffed white corn grits, coated with cheese flavoring containing coconut oil, process cheese and certified color.

Manufacture.—Selected grades of white corn grits are cooked under steam pressure, slightly dried, passed between rolls under pressure, dried and inflated under high pressure. The expanded product is screened, toasted, coated with a cheese flavoring (a mixture of coconut oil and process cheese) and packed in a moisture-proof bag.

Analysis (submitted by manufacturer).—Moisture 3.3%, total solids 96.7%, ash 2.9%, fat (ether extract) 24.1%, protein (N \times 6.25) 10.2%, reducing sugars as dextrose none, sucrose none, crude fiber 1.2%, carbohydrates other than crude fiber (by difference) 58.3%.

Calories.—4.91 per gram; 139 per ounce.

CRADLE BABY BRAND STRAINED AND SEEDLESS GRAPE JAM

Manufacturer.—Glaser, Crandell Company, Chicago.

Description.—Canned strained grape jam sweetened with sucrose. The jam may contain small amounts of added acid and/or pectin.

Manufacture.—Fresh Michigan Concord grapes are inspected, washed, stemmed and sent to the cooking rooms or frozen and stored. The fruit is sieved and the jam is prepared in essentially the same manner as that described for Cradle Baby Brand Strained and Seedless Fig Jam (THE JOURNAL, March 18, 1939, p. 1071).

Analysis (submitted by manufacturer).—Moisture 30.5%, total solids 69.5%, water-insoluble solids 0.4%, water-soluble solids 69.1%, ash 0.3%, protein (N \times 6.25) 0.4%, crude fiber 0.2%, carbohydrates other than crude fiber (by difference) 68.0%, acidity 0.6%.

Calories.—2.74 per gram; 78 per ounce.

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SATURDAY, APRIL 8, 1939

EXPERIMENTAL RENAL ATROPHY

Recently D. R. Drury¹ of the Department of Physiology, University of Southern California, has described a new method for the production of renal insufficiency of any desired grade in rabbits without the production of pathologic changes in the kidney epithelium. Numerous methods for the production of renal insufficiency in laboratory animals have been devised by previous investigators, such as the administration of nephrotoxins or other bacterial products, exposure to x-rays, surgical removal of one kidney with partial ablation of the other and, more recently, the application of Goldblatt ischemic clamps to the renal arteries. By all these technics, however, necrosis or other pathologic changes are produced in kidney tissue, particularly in rabbits. To avoid such cellular degenerations and to produce a purely quantitative reduction in renal function, Drury placed a loose silk ligature about the left renal artery of baby rabbits (400 Gm.) and allowed this loop to serve as a check to normal kidney growth. Adequate renal function was assured in these rabbits by a compensatory hypertrophy of the right kidney. As soon as the desired stage of dwarfism was demonstrable by palpation of the left kidney, the overgrown right kidney was removed. The animal was now dependent solely on the dwarfed left kidney for its total renal function. Drury regulated the diameter of the loop placed about the left renal artery by tying the silk ligature down on a wire of known diameter. The tie was made snugly but not tightly, so as to avoid crushing or damaging the accompanying artery, and the wire was withdrawn. The artery soon grew up to the size of the loop. Kidney growth was arrested at this stage. After removal of the overgrown right kidney, hypertrophy of the dwarfed left kidney is hindered by the restricted blood flow. By varying the size of the loop, any desired degree of renal dwarfism can be produced by this technic. In his current paper Drury reports dwarf kidneys as small as 20 per cent of the total normal combined kidney weight as well as kidneys of inter-

mediary size varying from 30 to 45 per cent of the combined kidney weight.

The California physiologist found that hypertension is demonstrable in his rabbits submitted to this procedure even before removal of the hypertrophied right kidney. Since the rabbits presumably have fully compensated renal function before this removal, his result suggests an unknown endocrine factor (or "mediator") secreted by the stunted left kidney. The nature of this hypothelial direct or indirect vasopressin has not yet been determined. After removal of the hypertrophied right kidney the hypertension is increased. Effects of ablation of the stunted left kidney at this stage of his operation have not yet been tested.

Among the other suggestive effects of the Drury renal atrophy is loss of appetite and resulting loss of weight in practically all animals depending solely on dwarfed kidney function. Disturbance of the sense of equilibrium and anemia were also frequent. The average hematocrit reading falls to about 25 per cent, as contrasted with approximately 30 per cent in normal rabbits. Hemorrhages are frequently found in the intestinal walls, with an occasional hemorrhage into the eyeball. Hypertension is uniformly accompanied by cardiac hypertrophy. The average heart weight in his hypertension rabbits was about 4 Gm. per kilogram of body weight, as contrasted with 2.35 Gm. per kilogram in normal controls.

Drury's most significant result is his observation that a relatively high degree of hypertension develops in renal atrophy before the removal of the hypertrophied and presumably fully compensating right kidney. Whether or not female rabbits at this stage of his operation would develop eclampsia² if allowed to become pregnant has not yet been determined.

MOTOR ACCIDENTS AT NIGHT

Numerous accidents at night on the highways continue to indicate the need of more adequate supervision of traffic. Whereas the enforcement of traffic laws has heretofore been mainly a daytime activity, many cities are now placing policemen on streets to handle traffic during the dark hours. Most motorists obtain their experience and training under daylight conditions; the problems that arise at night have not been sufficiently impressed on drivers, and traffic engineering has not kept pace with the situation.

The fatal motor accident rate at night, on the basis of traffic, is more than three times the accident rate during daylight. Motor vehicle fatalities during the hours of darkness have increased 43 per cent since 1930. The entire increase in traffic deaths in 1937 over those in 1936 resulted from the increase in night accidents. However, the recent emphasis on safe driving at night is producing results. The Committee on Night Accident Hazards of the National Safety Council reports for

1. Drury, D. R.: J. Exper. Med. 68: 693 (Nov.) 1938.

2. Dill, L. V., and Erickson, C. C.: Proc. Soc. Exper. Biol. & Med. 39: 362 (Nov.) 1938.

the first six months of 1938 a reduction of 26 per cent in the motor fatalities occurring during dusk and darkness.

In its analysis of the problem the committee finds that eyesight, driving experience and mental attitude are the important factors in the driver himself. He too is responsible for the associated problems of intoxication, speed, fatigue and age. The committee found that 78 per cent of the accidents in which the driver had been drinking occurred between 6 p. m. and 6 a. m. Further studies on intoxication as related to driving accidents are under way. Night driving involves a different technic from day driving because of the difference in visibility and in the reactions of the driver. Motorists should be taught night driving technic in their initial training. Much can be done to eliminate the hazards which are the result of low visibility at night. Highway officials should insist on the best design and maintenance of highways with adequate signs and warnings designed for good visibility at night. An improved type of lighting the highways is being installed in many places throughout the United States. The most common method of lighting the road is by means of headlights. Unfortunately the possibilities in head lamps on cars have not been developed as rapidly as those of other parts of the car. Headlights lose as much as half of their original effectiveness in a short time unless they are kept clean and adjusted. The committee recommends that officials consider the importance of securing adequate visibility for night driving and promote safety through installation of good illumination for heavily traveled and dangerous highways and by installation of flood lights at such hazardous locations as railroad crossings, intersections and special entrances.

Recently the Michigan Highway Department studied the use of reflector buttons on rural highways. Units were spaced 100 feet apart and 8 feet from the edge of the pavement on 80 miles of road between Lansing and Detroit. In the first three months of 1938 there was a reduction of 79 per cent in accidents on this stretch of highway, whereas on a control stretch of highway the reduction was only 19 per cent.

The night pedestrian is susceptible to accidents. Night pedestrian fatalities in Philadelphia increased from 56 per cent of the total number of night fatalities in 1935 to 73 per cent in 1937. In New Jersey in 1936, 67 per cent of the urban pedestrian fatalities and 83 per cent of the rural pedestrian fatalities happened at night. The committee urges that the pedestrian give the motorist every possible opportunity to see him. If it is necessary to walk at night in rural districts the pedestrian should carry a light when practicable and wear light colored clothing. Even carrying a white handkerchief is a considerable aid. Because the pedestrian sees the motor's headlights does not mean that the motorist sees him.

The night limits the speed for safe driving. The National Conference on Street and Highway Safety

recently fixed forty-five miles an hour as the *prima facie* speed limit at night in sections where the corresponding day limit is fifty miles an hour. Lower speeds are necessary in many places. Drivers should lower the speed at night in order to keep their safe stopping distance within the range of clear visibility. Safe driving at night is a challenge to the ingenuity of the driver, who must be alert for every indication of objects ahead or changes in the road.

DOCTOR, HERE'S YOUR BOOK!

Some time has passed since "The Story of San Michele" by Axel Munthe emerged shyly from its publisher's sanctum and began to attract public attention. The widespread enthusiasm with which that romantic tale of medical performances was received seemingly initiated a deluge of works by and about doctors, unique in the history of American publishing. Such works as "An American Doctor's Odyssey" by Victor Heiser, "The Citadel" by Cronin, "Fifty Years a Surgeon" by Robert T. Morris, "Fifty Years a Country Doctor" by William N. Macartney, "The Horse and Buggy Doctor" by Arthur E. Hertzler, "Doctor Bradley Remembers" by Francis Brett Young, the confessions of George Sava, James Harpole and Frederick Loonis, and a whole host of minor novels constitute the main exhibits. Most of these works were important as literary contributions to public understanding of the medical scene.

Most recent to attract public consideration is a somewhat autobiographical work entitled "Doctor, Here's Your Hat" by Dr. Joseph A. Jerger, published by a firm only recently in the general field known as Prentice Hall, Inc. This animated diary had previously appeared in part serially in the *American Magazine* and was digested from that partial publication in the *Reader's Digest*. Its literary qualities need not seriously concern us here. Indeed, from a literary point of view it has attracted little, if any, attention. However, the publisher and the author are apparently not averse to using the machinery of modern journalism to keep the volume in the public eye. Of late much propaganda has been devoted to the promotion of the belief that the headquarters office of the American Medical Association is in complete control of the practice of medicine in this country, dictating who shall act as physicians in the hospitals and exercising a control and restraint never within the prerogatives or the practices of the organization. Apparently in the course of his practice Dr. Jerger has had occasional difficulties with both the medical staffs and the directors of several hospitals in Chicago. From time to time these groups have apparently indicated to him that it would be preferable for him to associate himself elsewhere. In these activities, most of which occurred long before the book was published, each of the hospitals acted independently. Obviously, when such institutions are chartered the

right to control the staff rests with the boards of trustees or directors. Nevertheless, Dr. Jerger and his publishers apparently continue to spread the word that organized medicine barred him from the hospitals and that he is denied their facilities by the American Medical Association. This statement, widely disseminated by press associations, has even been made editorially in some newspapers of good repute. The statement is untrue and without the slightest basis in fact. Amazing, however, is the apparent willingness of newspapers and other agencies of public information to disseminate such charges without attempting to secure verification. The American Medical Association has until now failed to pay the slightest attention either to Dr. Jerger or to his book. According to an interview with Dr. Jerger in the New York *World-Telegram*, a committee of the Chicago Medical Society, entirely independently, requested Dr. Jerger to come before it to explain certain pronouncements which were made by him personally. As far as we know, even here no official action has yet been taken.

In any other matter newspapermen would probably have exercised a reasonable amount of diligence to avoid the possibility of being made the unpaid publicity agents for a publishing venture. In this instance at least they have lent themselves, albeit unwittingly, to aid the dissemination of what is after all not an outstanding literary performance.

Current Comment

THE BRINKLEY CASE

The suit for libel and damages filed by John R. Brinkley against the Editor of *Hygeia* was called in the federal court at Del Rio, Texas, on Wednesday, March 22. A jury consisting largely of residents of the vicinity of Del Rio was impaneled and evidence began to be offered by the plaintiff on the afternoon of the same day. In the course of the trial the plaintiff, Dr. John R. Brinkley, offered in evidence not only his own testimony but that of his associates; also a number of character witnesses. It was the decision of the court that patients would not be allowed to testify as to the results of any procedures performed on them. For the defendant there appeared three experts: Drs. Alfred I. Folsom, Dallas; Benjamin Weems Turner, Houston, and J. Manning Venable, San Antonio; also a chemist of the American Medical Association, Dr. E. W. Schoeffel, Chicago. Furthermore, there were read into the record several depositions containing evidence prepared for a previous suit of a similar character which was dismissed. Among the exhibits offered were most of the pamphlets circulated by the plaintiff and a book concerned with his biography written by Clement Wood and entitled "The Story of a Man." Following the completion of the evidence, which required four full days, attorneys for both sides presented the case to the jury and the instructions were given to the jury by Judge R. J. McMillan. After a

consideration of several hours, the jury returned its verdict for the defendant. In a future issue of *THE JOURNAL* (probably the issue of April 22) and also in *Hygeia* it is proposed to present a complete abstract of the evidence and the instructions of Judge McMillan to the jury.

YELLOW TYPHOID BACILLI

The transformation in the test tube of nonpathogenic flavobacteria into virulent typhoid bacilli, recently alleged by Dresel and his co-workers¹ of Leipzig, Germany, challenges conventional theories of epidemiology in typhoid. Eight years ago, several strains of yellow bacteria were isolated from urinary samples. By repeated "single cell" cultivation of these flavobacteria nonpigmented variants were eventually obtained morphologically, culturally and antigenically identical with standard strains of *B. typhosus*. Reversing the process, the investigators were able to dissociate from a standard laboratory strain of *B. typhosus* a yellow variant (*Bacterium typhi flavum*). More than sixty species of flavobacteria are recognized by American bacteriologists, most of them regarded as common saprophytes in surface waters. Several strains, however, such as *Flavobacterium fecale* and *Flavobacterium estero-aromaticum*, have been isolated from the intestinal contents of man or as presumptive contaminants from human necropsy material. Medical bacteriologists of the past have usually disregarded these yellow bacteria as of little clinical interest, since none of the known yellow strains had been shown to be pathogenic for man or lower animals. The conclusion of the Leipzig bacteriologists, however, that some species of flavobacteria are merely disguised forms of *Bacillus typhosus* may lead to a critical reexamination of the experimental evidence leading to this conclusion.

REPORTS OF OFFICERS AND THE BOARD OF TRUSTEES

In this issue of *THE JOURNAL* under the Organization Section appear the reports of the officers of the American Medical Association and of the Board of Trustees and of the various Councils and Bureaus which will be presented to the House of Delegates at the next annual session of the Association, to be held in St. Louis May 15-19. These reports constitute a survey of current problems in the field of medical practice and of the activities of the American Medical Association in relationship thereto. Every physician who holds membership in the organization, and particularly Fellows of the American Medical Association, should make a most careful study of this material. The responsibilities now assumed by organized medicine are vital in relationship to the health and welfare of the nation. The determination of the policies of the organization rests with the House of Delegates, which is itself directly representative of the membership. The material will be found of exceeding interest as marking an epoch in the affairs of the American Medical Association.

1. Dresel, E. G., and Graf, Willi: *Arch. f. Hyg. u. Bakt.* 119: 153 (No. 3) 1937. Dresel, E. G., and Löttsch, Herbert, *ibid.* 120: 286 (Nos. 4 and 5) 1938.

ORGANIZATION SECTION

REPORTS OF OFFICERS

NOTE.—At the 1925 session of the Association, the House of Delegates suggested that all reports of officers, committees, etc., and resolutions to be brought before the House, if available, be published in advance of the session so as to permit careful consideration and discussion.—Ed

REPORT OF THE SECRETARY

To the Members of the House of Delegates of the American Medical Association

The following annual report of the Secretary is respectfully submitted

MEMBERSHIP AND FELLOWSHIP

A review of the Membership and Fellowship records for the five years from 1934 to 1938 inclusive shows that there has been a constant increase in the number of members as well as in the number of Fellows. Official reports of the Secretary submitted to the House of Delegates have included the following figures for each of these five years. In 1934 the number of members was 98,041 and the number of Fellows 60,714, in 1935 there were 99,536 members and 61,406 Fellows, in 1936 the members numbered 101,946 and the Fellows 62,997, in 1937 the number of members was 105,460 and the number of Fellows 66,296, in 1938 there were 109,435 members and 68,478 Fellows, and on March 1, 1939, the official membership list carried the names of 112,210 physicians, while the names of 69,468 Fellows were recorded on the Fellowship roster.

The figures here presented would seem to refute definitely statements emanating from various sources during these five years designed to indicate that there have been great disaffection in the ranks of the physicians of the United States and great diminution in the support of the profession generally for the established policies of the American Medical Association. During these same years, in which significant increases in both membership and Fellowship have been recorded, there has been a tremendous increase in the number of requests for service of various kinds. These requests have poured into the offices of the Association from state medical associations, from county and district medical societies, from independent organizations of physicians, from official governmental agencies, from the public press, from officers and members of civic groups and from the general public. While it is true that a considerable number of communications critical of the policies of the Association and its constituent and component societies have been received, it is also true that a tremendously larger number of communications have been received from the duly appointed officers of medical societies and other organizations, from hundreds of individual physicians and from many laymen indicating confidence in the medical profession of the United States in its organized capacity and as a profession and expressing appreciation of the efforts that have been made by the American Medical Association to carry out the aims and objects defined in its Constitution and By-Laws and to serve the public interest.

MEDICAL ORGANIZATION IN THE STATES

It will be seen from the figures presented in an accompanying table that physicians of 2,058 of the 3,139 counties of the United States are now included in the membership of component county medical societies. On March 1, 1939, there were 386 counties in which no organization of physicians has been effected as compared with 397 such counties in 1938. Very considerable progress has been made in promoting the efficiency of the official machinery of a number of constituent state medical associations. A larger number of component county medical societies now employ full time secretaries or executive secretaries than ever before, and there can be no doubt that through the employment

of full time personnel the work of county medical societies is better organized and more efficiently carried out than otherwise could be done.

Organization of Constituent State Medical Associations

	Number of Counties in State	Number of Com- ponent Societies in State	Organization of Constituent State Associations								Number of A M A Fellows in State
			Number of Counties in State Not Organized		Number of Physi- cians in State 15th Ed A M A Directory	Number of Members of State Associations					
			1938	1939	1938	1939					
Alabama	67	67			2,072	1,518	1,509	566			
Arizona	14	13			502	339	379	259			
Arkansas	75	60	1	1	1,850	1,068	1,036	426			
California	58	39	10	11	11,278	5,906	6,210	4,302			
Colorado	68	28		10	1,623	1,130	1,140	742			
Connecticut	5	5			2,408	1,621	1,659	1,064			
Delaware	3	3			376	209	209	130			
District of Columbia					2,141	824	849	659			
Florida	67	34	21	19	2,012	1,781	1,275	701			
Georgia	159	93	44	46	2,756	1,793	1,818	704			
Idaho	44	10			426	277	268	161			
Illinois	102	92	6	6	11,942	7,485	7,606	4,756			
Indiana	92	53	1	1	4,081	3,087	3,136	1,796			
Iowa	99	97			3,100	2,414	2,406	1,429			
Kansas	105	69	20	19	2,117	1,509	1,512	982			
Kentucky	120	114	4	4	2,762	1,770	1,879	790			
Louisiana	64	42	16	17	2,200	1,324	1,446	766			
Maine	16	15	1	1	957	690	727	396			
Maryland	23	23			2,821	1,884	1,401	970			
Massachusetts	14	18			7,238	5,109	5,159	3,113			
Michigan	83	54			6,142	3,987	4,196	2,493			
Minnesota	87	34	1	1	3,426	2,519	2,524	1,560			
Mississippi	82	21	1	1	1,495	945	1,016	742			
Missouri	114	81	11	11	3,348	3,216	3,231	1,931			
Montana	56	16	25	20	520	357	363	238			
Nebraska	93	49	19	16	1,700	1,094	1,086	711			
Nevada	17	9	12	12	148	104	107	71			
New Hampshire	10	9			616	498	511	281			
New Jersey	21	21			5,433	3,309	3,604	2,488			
New Mexico	31	15	14	16	419	235	254	171			
New York	62	61	1	1	20,613	16,080	16,606	10,263			
North Carolina	100	74	19	18	2,663	1,616	1,689	809			
North Dakota	53	13	10	10	508	413	390	254			
Ohio	58	87	2	2	9,117	6,099	6,271	3,712			
Oklahoma	77	65	7	7	2,364	1,470	1,456	793			
Oregon	36	24	3	2	1,386	746	774	527			
Pennsylvania	67	60	6	6	13,205	8,874	9,077	5,968			
Rhode Island	5	6	1	1	938	485	494	312			
South Carolina	46	39	2	2	1,354	897	943	400			
South Dakota	69	12	2	1	530	320	317	185			
Tennessee	90	60	24	24	2,917	1,727	1,719	827			
Texas	254	125	15	15	6,795	4,930	4,246	2,707			
Utah	29	9	4	4	567	443	449	270			
Vermont	14	10	3	3	501	373	374	211			
Virginia	100	47	9	9	2,618	1,739	1,756	985			
Washington	39	24	13	13	2,123	1,401	1,377	887			
West Virginia	50	30	5	5	1,893	1,207	1,202	685			
Wisconsin	71	52			3,436	2,435	2,450	1,223			
Wyoming	24	11	11	11	266	166	170	114			
Alaska					65	36	39	20			
Hawaii	5	4	1	1	410	266	277	121			
Isthmian Canal Zone					198	118	122	19			
P. I. (Provinces)	56	22	40	34	3,107	921	1,004	50			
Puerto Rico	7	7			445	370	358	70			
Foreign					26			185			
	3,139	2,058	397	386	173,879	109,435	112,210	68,537			
Commissioned medical officers								2,931			
								69,468			

FIELD WORK AND CORRESPONDENCE

Official representatives of the American Medical Association have attended more meetings of state and county medical societies and have appeared before more lay audiences within the last year than in any preceding year. It is not possible to give a

thoroughly dependable estimate of the number of persons that have composed either the professional or the lay audiences addressed by these representatives, but it is believed that the lay audiences have numbered more than 150,000 persons and that audiences composed of physicians have numbered from 25,000 to 40,000. Some constituent state medical associations and some of the larger component county medical societies have maintained speakers' bureaus through which speakers have been provided to address civic groups and student bodies of public schools, colleges and universities. The nation wide radio program of the American Medical Association has been heard by a very large but undetermined number of children in schools and of older persons in their homes.

A veritable mass of correspondence pours into the offices of the Association each day, a large part of which consists of communications from the lay public.

In these several ways the aims and objects of the Association and the nature and scope of its work are brought to the attention of both the profession and the public.

SPECIAL SESSION OF THE HOUSE OF DELEGATES

A special session of the House of Delegates was held in Chicago Sept. 16 and 17, 1938, for the purpose of giving official consideration to the national health program submitted to the National Health Conference held in Washington, D. C., in July of 1938 and to other matters submitted by the Board of Trustees. Copies of the proceedings of this special session have been sent to each member of the House of Delegates in attendance at that session, and an account of the proceedings has been widely distributed among physicians and among the members of legislative bodies and of various other groups.

ANNUAL CONFERENCE OF SECRETARIES OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

The regular Annual Conference of Secretaries of Constituent State Medical Associations was not held in 1938. All state secretaries and the editors of all official journals of state medical associations were invited to attend the special session of the House of Delegates held in Chicago September 16 and 17, and most of the members of these two groups attended that session.

REPORTS OF DELEGATES TO STATE ASSOCIATIONS

It has been most gratifying within recent years to note the completeness of reports submitted by members of this House of Delegates to their constituent state medical associations. In some instances these reports have been published in state medical journals almost immediately after the annual meetings of the House, while in other instances such reports have not been submitted until the meetings of the houses of delegates of the state associations.

There can be little doubt that the members of the Association generally are better informed through the publication of these reports prepared and presented by members of this House of Delegates than they otherwise would be, and their interest in the affairs of the Association and their knowledge of the nature and scope of its activities will be increased and enhanced if such reports are made available to them.

MEMORIALS AND RESOLUTIONS

Up to the time of the preparation of this report, no memorials, resolutions or proposed amendments to the Constitution and By-Laws have come to the Secretary for transmission to the House of Delegates.

IN APPRECIATION

In offering this, his seventeenth consecutive report submitted to the House of Delegates, the Secretary desires to express his grateful appreciation of the helpful consideration and the kindly assistance extended to him by the officers of the Association, by members of the House of Delegates and by the officers and a great many members of component county medical societies and of constituent state medical associations. He also desires to acknowledge his gratitude for the cordial cooperation extended by members of the administrative personnel of the Association and especially his gratitude for the loyal and efficient service of those immediately associated with him in the work of the Secretary's office.

Respectfully submitted.

OLIN WEST, Secretary.

REPORT OF THE BOARD OF TRUSTEES

To the Members of the House of Delegates of the American Medical Association:

Within the last few years, many problems of the most important interest to medicine have demanded earnest consideration by medical organizations. Most of these problems are not at all new, having been created out of developments that have naturally followed on the continued advancement of scientific medical knowledge and the need for improved methods for applying such knowledge. Some of these problems have been brought up more acutely because of the activities of various agencies outside the medical profession that are most largely concerned with political considerations or because of long-continued economic disturbances. The existing situation is one that has created tremendously larger demands than ever before on the time and effort of the officers, official bodies and administrative personnel of the American Medical Association. It has necessitated expansion in several of the divisional offices and has required some extension in both the nature and the scope of Association activities. The volume of work done in practically every department during the last year was very considerably larger than in any preceding year. Present indications are strongly to the effect that even greater demands will be made on the Association in future years and it is reasonable to expect that further expansion of the Association's facilities will be required.

Business Operations

Gross income from all sources for the year ended Dec. 31, 1938, amounted to \$1,758,147.09, representing an increase of \$2,837.25 over the total income of the preceding year. Total expense for the year ended Dec. 31, 1938, amounted to \$1,769,548.60, an increase of \$136,481.68 over total expenditures for the year 1937. The net loss for the year was \$11,401.51.

Payments received for Fellowship dues and subscriptions in 1938 amounted to \$655,875.91 as compared with \$670,170.31 in 1937. Total receipts from the sale of advertising space in 1938 amounted to \$875,367.43 as compared with \$841,042.57 in the preceding year. Income received from interest on investments in 1938 was \$86,857.26 and, through the sale of securities, the sum of \$2,831.25 was realized.

Collections from subscriptions and Fellowship dues, notwithstanding an increase in both the number of Fellows enrolled and the number of subscribers to THE JOURNAL, were less in 1938 than in the preceding year by the sum of \$14,294.40. Receipts from the sale of advertising space were larger than in the preceding year by the sum of \$34,324.86. Interest received on investments in 1938 exceeded receipts on this account in 1937 by the sum of \$3,293.52. Office salaries and wages in 1938 amounted to \$259,953.13, an increase over the preceding year of \$11,292.55. The factory payroll in 1938, amounting to \$226,389.15, was larger than in 1937 by the sum of \$14,867.72. The cost of paper in 1938 was greater than in the preceding year by a sum slightly in excess of \$10,000. Expenditures for first class postage in 1938, amounting to \$38,871.82, were larger than in 1937 by the sum of \$3,341.69, and expenditures for second class postage in 1938 exceeded those of the preceding year by the sum of \$2,591.33.

Expenditures incident to the operation of the various councils, bureaus and departments of the Association during the year covered by this report were \$458,499.27, representing an increase of \$26,496.58 over the expenditures of the preceding year.

Expenditures for legal services, amounting to \$67,096.56, were larger in 1938 than in 1937 by the sum of \$43,807.96. These larger expenditures were made necessary because of the indictment of the Association at the instance of the federal Department of Justice for alleged violation of the Anti-Trust Laws; a ruling of the Bureau of Internal Revenue under which the Association was made liable for the payment of Social Security taxes and classified as a business league rather than a scientific and educational organization, and several suits filed against the Association.

The building and equipment of the Association have been maintained to the best possible advantage. As this report is

being prepared, some new machinery, including a gathering machine of the latest model, is being installed at a cost of approximately \$36,000.

The number of employees of the Association is now slightly less than 600, but this number will be considerably increased when the preparation of the next edition of the American Medical Directory is begun.

A more detailed presentation of income and expenditures will be found in the reports of the Treasurer and the Auditors, which are submitted as a part of this official report of the Board of Trustees.

Summary

Total income in 1938 was larger than in 1937, but the increase in total expenditures was considerably larger than the increase in income. Income from interest on investments was slightly larger in 1938 than in the preceding year. Total expenditures were larger than income by the sum of \$11,401.51.

The Journal of the American Medical Association

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION continues to occupy the place achieved in previous years as a leader in the dissemination of knowledge of advances in medical science and as a representative of the point of view of the organized medical profession of the United States.

TABLE 1—Approximate Count of Fellows and Subscribers on The Journal Mailing List, by States, Jan. 1, 1939, Also Gain or Loss in Each State

State	Fellows	Subscribers	Totals	Gain	Loss
Alabama	716	246	762	7	
Arizona	243	117	360	16	
Arkansas	91	239	627	46	
California	4,189	2,774	6,714	513	
Colorado	647	277	922		45
Connecticut	1,019	627	1,646	72	
Delaware	12	81	204		5
District of Columbia	624	170	1,194	63	
Florida	674	368	1,062	48	
Georgia	730	40	1,037		11
Idaho	150	117	263	13	
Illinois	4,368	2,530	7,218	42	
Indiana	1,696	664	2,260	47	
Iowa	1,237	426	1,663	14	
Kansas	876	286	1,162		
Kentucky	727	360	1,057	17	
Louisiana	67	443	1,018	39	
Maine	777	153	530	15	
Maryland	869	632	1,321	55	
Massachusetts	2,845	1,687	4,532	82	
Michigan	2,200	1,254	3,454		25
Minnesota	1,373	621	1,994	18	
Mississippi	294	138	432	21	
Missouri	1,735	894	2,629		24
Montana	199	101	300	19	
Nebraska	623	266	889		32
Nevada	64	33	97	7	
New Hampshire	271	97	368	19	
New Jersey	2,367	1,508	3,875	109	
New Mexico	161	79	240	6	
New York	9,470	9,910	15,415	186	
North Carolina	751	536	1,287	48	
North Dakota	211	80	296	13	
Ohio	3,450	1,370	5,020	31	
Oklahoma	681	315	996	45	
Oregon	463	300	763	59	
Pennsylvania	1,626	2,601	8,227	82	
Rhode Island	331	202	533		2
South Carolina	348	240	588	14	
South Dakota	178	117	295	16	
Tennessee	744	436	1,180	20	
Texas	1,002	847	2,749	97	
Utah	237	87	324	5	
Vermont	207	82	289	5	
Virginia	931	441	1,372	51	
Washington	793	365	1,158	39	
West Virginia	610	200	900	26	
Wisconsin	1,334	646	2,000		21
Wyoming	10	2	157	4	
U. S. Army		173	173	2	
U. S. Navy		212	212	11	
U. S. P. H. S.		96	96	96	
Alaska	18	26	44	7	
Canada	13	811	824		33
Cuba	3	103	106		3
Hawaii	106	73	179		5
Mexico	8	86	94		28
Panama	16	36	52		2
Philippine Islands	40	229	274		44
Puerto Rico	60	64	124		11
Virgin Islands	2	5	7		
Foreign	111	2,967	3,078	157	
Advertisers, agents			499		30
Exchanges			320		12
Complimentaries			118		17
Total on mailing list			99,834	2,378	274

Among the new features developed during the past year has been the Student Section, which appears once each month, the first issue appearing in July 1938. In this section are articles, abridgments of essays and medical news pertaining especially to student activities and to medical schools. This section of THE JOURNAL was established by the Board of Trustees in

TABLE 2—Percentage of Physicians Receiving The Journal*

State	Number Receiving Journal	Physicians in State A. M. A. Directory	Approximate Percentage Receiving Journal
Alabama	762	2,072	37
Arizona	360	562	64
Arkansas	627	1,850	34
California	6,714	11,278	59
Colorado	922	1,923	48
Connecticut	1,646	2,703	66
Delaware	204	326	62
District of Columbia	1,194	2,141	56
Florida	1,062	2,072	51
Georgia	1,035	2,756	38
Idaho	263	426	61
Illinois	7,218	11,942	60
Indiana	2,260	4,081	55
Iowa	1,663	3,100	53
Kansas	1,162	2,117	54
Kentucky	1,057	2,762	39
Louisiana	1,018	2,200	46
Maine	530	987	54
Maryland	1,321	2,821	54
Massachusetts	4,532	7,528	60
	3,454	6,142	56
	1,994	3,426	58
	432	1,495	29
Missouri	2,629	5,348	49
Montana	300	520	57
Nebraska	889	1,705	52
Nevada	97	148	65
New Hampshire	368	616	59
New Jersey	3,875	5,433	71
New Mexico	240	419	57
New York	15,415	25,613	60
North Carolina	1,287	2,663	48
North Dakota	296	608	58
Ohio	5,020	9,117	55
Oklahoma	996	2,364	42
Oregon	763	1,886	55
Pennsylvania	8,227	13,205	62
Rhode Island	533	938	57
South Carolina	588	1,304	43
South Dakota	295	335	88
Tennessee	1,180	2,917	40
Texas	2,749	6,795	40
Utah	324	567	57
Vermont	289	501	57
Virginia	1,372	2,818	48
Washington	1,158	2,122	54
West Virginia	903	1,878	49
Wisconsin	2,000	3,436	58
Wyoming	157	266	59

* This table gives the number of physicians (based on the Fifteenth Edition of the American Medical Directory) in the United States, the number receiving THE JOURNAL and the approximate percentage in each state. Copies to physicians in the United States Army, Navy and Public Health Service are not included.

order to inform the practicing physicians of tomorrow concerning the problems of today. Much of the material is developed by educators and those interested in the problems of medical education, yet opportunity has been given also to the students, to interns and to residents to discuss problems of special concern to them. A questionnaire circulated among students in twenty different medical schools indicated that the majority had a favorable point of view toward the material thus published. It is proposed to continue the development of this department to meet the need which is apparent for contact between the student, the intern, the resident and the practicing physician.

The Organization Section of THE JOURNAL has been largely devoted to problems of current interest in the fields of legislation and medical economics. Of special interest have been the reports of the results of the surveys of medical service carried out in individual counties and municipalities as well as in some states.

Other features currently appearing in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION which have aroused considerable comment are the series of articles on the vitamins, a series of pharmacologic and therapeutic conferences held in the New York Hospital, and the clinical articles developed during the last annual session of the American Medical Association. Thus, while THE JOURNAL has kept abreast of the most important advances in research, it has not neglected the clinical aspects of daily work.

The department of Queries and Minor Notes has maintained its popularity. Special issues have appeared during the year devoted to the hospitals, to medical education, to state licensure and to the annual session. Among the research projects conducted by THE JOURNAL have been cooperation with the United States Public Health Service in determining the availability of typing for pneumococci, the annual reports on deaths from typhoid fever and from diphtheria, and a special survey devoted to Fourth of July accidents.

Table 1, included in this report, indicates the number of Fellows and Subscribers on the mailing list of THE JOURNAL in each state on Jan. 1, 1939. There is also shown in this table the number of Fellows and subscribers in other countries, the number of copies of THE JOURNAL sent to advertisers and subscription agents and the number sent as exchanges and complimentary subscriptions. Table 2 indicates the number and the approximate percentage of physicians in each state who receive THE JOURNAL.

The circulation of THE JOURNAL on Jan. 1, 1939, was 99,854, an increase of 2,104 over the preceding year.

Summary

It has been the earnest purpose of the Board of Trustees and of the Editorial Department to maintain The Journal of the American Medical Association in its established position of leadership in the field of medical journalism and to increase its usefulness both as a scientific periodical and as a defender of the public interest.

Among the new features developed during the past year has been the Student Section, which appears once each month, dealing with matters pertaining especially to student activities and to medical schools. It is proposed to continue the development of this department of The Journal so as to meet the apparent need for contact between the student, the intern, the resident and the practicing physician.

The Organization Section of The Journal, devoted to discussions of problems of current interest in the fields of legislation and medical economics, has been well received and will be further developed as opportunity offers.

Special articles dealing with clinical aspects of the daily work of physicians have been published from time to time and apparently have aroused much interest and have been made the subject of much favorable comment.

The popularity of the department of Queries and Minor Notes has been maintained and is apparently serving an important purpose. The publication of special issues devoted to medical education, hospitals, licensure and other phases of the Association's activities have been continued. The Journal has cooperated with various agencies, including agencies of the federal government, and has published annual reports dealing with mortality due to typhoid fever and diphtheria and has undertaken a special survey pertaining to Fourth of July accidents.

Special Journals

The usual high standards, both scientific and mechanical, have been maintained for the special journals during 1938. The number of pages of reading material published was approximately the same as in 1937, except in three of the periodicals, viz. the ARCHIVES OF DERMATOLOGY AND SYPHILOLOGY, the ARCHIVES OF OTOLARYNGOLOGY and the ARCHIVES OF PATHOLOGY. Increases in the number of pages of practically all the periodicals will be necessary if the material that is accepted is to be published within a reasonable length of time. There was an increase in the subscription list of each of the periodicals, ranging from 75 to 225 and totaling 1,168.

During 1938 there was a considerable reduction in the number of pages of advertising carried in these journals, namely 778 as compared with 1,104 in 1937, the result probably of retrenchment on the part of business houses. The loss in receipts from advertising during 1938 as compared with 1937 was \$2,240.71.

A special issue of the ARCHIVES OF PATHOLOGY was published in July 1938 as a testimonial to the life and work of Dr. Ludvig Hektoen on the occasion of his seventy-fifth birthday. This issue comprised 448 pages of articles contributed by physicians who were his students or who were closely associated with him in his many activities.

Owing to the unfortunate illness of Dr. Dean DeWitt Lewis, chief editor of the ARCHIVES OF SURGERY, Dr. Waltman Walters was appointed chairman pro tem of the Editorial Board. Drs. Arthur W. Allen of Boston, Alfred Blalock of Nashville, Lester R. Dragstedt of Chicago and Walter E. Dandy of Baltimore have been added to the Editorial Board in order to develop the periodical still further along practical lines.

In addition to the exhaustive articles in experimental surgery published in the past, shorter articles dealing with progress in surgery of clinical application, general reviews of the literature and editorials in which debatable surgical topics can be discussed will be published.

Summary

Slight increases were recorded in the total circulation of all the publications in this group. Only three of the special journals produced income exceeding the costs of publication, namely the Archives of Otolaryngology, the Archives of Ophthalmology and the American Journal of Diseases of Children. Net income for the American Journal of Diseases of Children barely exceeded the cost of publication.

The net loss on the entire group of special journals was \$28,883.35, as compared with \$25,958.37 in 1937 and \$33,821.30 in 1936.

Library

A geographic analysis of requests for service coming to the Library of the American Medical Association indicates that the greatest number of requests come from Illinois, New York, Ohio and Pennsylvania. Nevertheless, every state in the United States and every province in Canada has availed itself of such services. During 1938, 13,012 periodicals were lent to subscribers, an increase of 2,253 loans over 1937.

The Package Library Service continues to supply material to great numbers of inquirers, notwithstanding the fact that similar services have now been set up by several of the individual state medical societies. During 1938, 3,016 packages were distributed to physicians of the United States and of Canada. The subjects on which packages were most frequently requested were alcoholism, arthritis, pneumonia, sulfanilamide, syphilis, tuberculosis and vitamins.

In addition to the lending of periodicals and of packages of references, the Library answered by letter and by telephone approximately 5,000 individual inquiries on medicobibliographic subjects. Moreover, more than 1,500 persons visited the Library during the year in search of material which was supplied to them.

The great demands on the space available in the headquarters office of the Association made necessary during the year the removal of the Employees' Library from the special room which it occupied to a place on the Library floor. The total circulation for the year was 5,100 books. The Employees' Library now owns 2,030 books and subscribes to twenty magazines. Moreover, material is regularly received by loan from the Chicago Public Library.

The QUARTERLY CUMULATIVE INDEX MEDICUS constitutes the major project of the Library department. During 1938 forty additional periodicals were added to the list of periodicals regularly indexed and fifty-six periodicals were selected for occasional indexing of important items. The universal acclaim tendered to this project, which is maintained by the American Medical Association at a considerable loss, indicates not only the necessity of the service but the excellence of its conduct.

Summary

The activities of the Library have been continued along the same lines previously followed. There was a considerable increase in the number of periodicals lent to subscribers, and the Package Library has continued to

supply material largely for the use of members of the Association who do not have ready access to medical libraries. Approximately 5,000 individual inquiries on medicobibliographic subjects were answered during the past year, and more than 1,500 persons visited the Library in search of such material. The Quarterly Cumulative Index Medicus constitutes the major project of the Library department.

Quarterly Cumulative Index Medicus

There was a slight increase in 1938 in the number of subscribers to the QUARTERLY CUMULATIVE INDEX MEDICUS. The cost of production over income was \$43,034.71, as compared with \$42,616.32 in 1937.

It is undoubtedly true that the general use of the QUARTERLY CUMULATIVE INDEX MEDICUS in libraries has increased, but the number of subscriptions has not grown correspondingly. The INDEX is available for the use of individual physicians and investigators in practically all important medical libraries, in several general libraries and in some hospitals, where a single volume is available for the use of many individuals.

Standard Classified Nomenclature of Disease

The publication of this guide to nomenclature was assumed by the Board of Trustees of the American Medical Association at the request of the National Conference on Nomenclature of Disease, which first issued the volume in 1932. This nomenclature has been approved by most of the leading special scientific organizations in the United States, and most of them have cooperated in its development.

Since the project was taken over by the American Medical Association, nearly 2,000 copies have been sold.

A questionnaire circulated to the hospitals of the United States indicates that 753 hospitals use the Standard Classified Nomenclature.

Steps are being taken toward the preparation of a new revised edition subsequent to the national conference, which will be called in 1940.

Preparation has also been made to undertake the Standard Classified Nomenclature of Surgical Operations.

The New York Hospital has tendered to the American Medical Association the use of its Nomenclature of Operations as a basis for the development of the standard list. A list of consultants is being developed for this purpose and also for revision of Nomenclature of Disease.

Hygeia

The maintenance of the circulation of HYGEIA, the recognition of its worth particularly by educators throughout the United States, and the innumerable citations from its pages appearing regularly in digest publications, in other health periodicals, in bulletins of various industrial and similar organizations and in newspapers indicate the manner in which HYGEIA has become a source book for information on health throughout the nation. Moreover, several radio programs are now devoted largely each week to citation of material taken from this publication. Beginning with the current volume, improvements were made in the typography, arrangement and illustration of the magazine. A prompt response ensued on the part of numerous readers. Every effort is being made by the Board of Trustees to further the development of this publication as an invaluable contact directly with the public and as a means of extending more widely the benefits of medical science.

The circulation of HYGEIA has been maintained above the 100,000 mark. Through the splendid efforts of the Woman's Auxiliary in Tennessee, an order was received from the state of Tennessee for 6,182 subscriptions whereby the magazine was placed in the public schools throughout Tennessee. Income from the sale of advertising space in HYGEIA has rather steadily declined.

The loss incurred on account of the publication of HYGEIA in 1938 was \$18,896.12, as compared with a loss of \$31,004.90

in 1937. The indicated reduction was accomplished by resorting to all possible economies that would not interfere with improvement in the magazine.

Summary

Improvements have been made in the typography, arrangement and illustration of Hygeia. The magazine apparently has established itself in many schools as a source book for information on health, and material from its columns is being reproduced in a large number of lay publications and has been used to some extent in radio programs.

The circulation of Hygeia has been maintained above 100,000. The net loss on this publication for the year 1938 was \$18,896.12, as compared with a loss of \$31,004.90 in 1937.

Book Publications of the American Medical Association

While the American Medical Association does not contemplate any large invasion of the field of book publication, the assembling of material first issued in the form of feature articles is a logical step in its work. The volumes now available include "The Handbook of Therapy," in its eleventh edition, "The Technic of Medication," in its third edition, "Medical Writing: Its Art and Technic," "A. M. A. Intern's Manual," "The Primer on Fractures," now in its fourth edition, "The Handbook of Physical Therapy," in its third edition, "Medicolegal Cases" and "Simple Lessons in Human Anatomy." In the course of preparation are a new volume on the vitamins and a series of twenty-four cases entitled "The Pharmacopeia and the Physician," prepared in cooperation with the United States Pharmacopeial Committee. The Association publishes, moreover, the special volumes issued by the Council on Pharmacy and Chemistry and the Bureau of Investigation. In process of preparation is a new book to be called "Accepted Foods," which is being prepared under the auspices of the Council on Foods.

American Medical Directory

The American Medical Directory is in some respects one of the most important of the Association's publications. The information contained in this volume is essential for the purposes of the Association itself and is of great value to constituent state and territorial medical associations, to component county medical societies and to many agencies, governmental and otherwise, that find it necessary to have dependable information concerning the medical profession and medical institutions.

The Fifteenth Edition of the American Medical Directory was published in 1938. The names and addresses of the legally qualified physicians of the United States and Canada, together with biographic material concerning them, are published in the Directory. The number of names listed in 1938 was 188,916, as compared with 183,312 in the Fourteenth Edition. While 13,811 new names were printed in the Fifteenth Edition of the Directory, 8,008 physicians whose names appeared in the Fourteenth Edition died in the interim, and approximately 200 names which appeared in the Fourteenth Edition did not appear in the Fifteenth Edition for various reasons, including revocation of licenses and withdrawals from practice for other reasons.

The publication costs of the Fifteenth Edition of the American Medical Directory amounted to \$165,794.47. The sales of the Directory up to the time of the preparation of this report have failed to equal production costs by the sum of \$8,488.90. It is reasonable to expect that this deficit will be reduced to some extent by additional sales.

Summary

The Fifteenth Edition of the American Medical Directory contains the names of 188,916 physicians of the United States and Canada. More than 13,000 new names appeared in this edition, while approximately 8,000 names which appeared in the Fourteenth Edition were dropped

because of deaths and for other valid reasons. The cost of compiling and publishing the information presented in the Fifteenth Edition of the Directory was \$165,794.47. The income received from sales up to the time of preparation of this report was less than the cost of publication by the sum of \$8,488.90.

Cooperative Medical Advertising Bureau

The Cooperative Medical Advertising Bureau is operated for the benefit of official publications of constituent state medical associations, and thirty-three of these publications are represented in the Bureau. Advertising contracts secured through this Bureau for state journals in 1938 amounted to \$166,704.57, which represents an increase of about \$10,000 over the year 1937. Commissions earned by the Bureau amounted to \$33,392.45, of which amount the sum of \$17,500 was rebated to the state journals after the costs of maintaining the Bureau were subtracted from the total amount of commissions earned.

Thirty-three state medical journals were members of the Cooperative Medical Advertising Bureau in 1938. In January 1939 the *New York State Journal of Medicine* was added to the list of publications served by this Bureau.

Summary

The earnings of the Cooperative Medical Advertising Bureau in 1938 were \$33,392.45, of which amount the sum of \$17,500 was distributed among the state journals after the operating costs of the Bureau had been deducted. The total amount of the value of advertising contracts secured through the Bureau for the state medical journals was \$166,704.57.

The *New York State Journal of Medicine* was added on Jan. 1, 1939, to the list of journals participating in the Bureau.

Mailing and Order Department

A total of 69,736 orders were handled by the Order Department during the year covered by this report. The total units distributed were 398,564. The use of more than 5,000 mail bags with a total weight of 156 tons was required to carry the material distributed through orders received.

The total number of pieces of first and third class mail sent out by the Mailing Department was 1,699,477. Nearly three and one-half million envelopes were required for all mailing purposes.

American Medical Association News

During 1938-1939 a department to aid in press relations was established in the headquarters office, in charge of a professional newspaper writer, Mr. Lawrence C. Salter. From this department each week there is issued the *AMERICAN MEDICAL ASSOCIATION NEWS*, containing excerpts or rewrites of material published in the various publications of the American Medical Association and also special announcements concerning the activities of the organization. This bulletin is sent regularly to all press associations, to news sources, to periodicals and to the editors of medical journals and of bulletins of county medical societies.

Conference with Representatives of Hospital Associations

On invitation of the Board of Trustees of the American Medical Association, members of the board of trustees of the American Hospital Association and representatives of the Catholic Hospital Association and the American Protestant Hospital Association met in conference at the offices of the American Medical Association on Feb. 15, 1939. Various matters of mutual interest to the groups represented were frankly discussed, and it was most gratifying to note that there was decided unanimity of opinion with respect to many phases of the general subject of medical care in hospitals, even though there may be some differences between the basic policies of one or more hospital associations and those of the American Medical Association.

Among questions that received consideration at this conference were those having to do with group hospitalization and an apparent tendency on the part of some of the hospital groups to include both special and general medical service in contracts offered to their members as well as other questions of major importance and present interest. During the conference the following resolution was unanimously adopted by the representatives of the three hospital associations:

The representatives of the American Hospital Association, the Catholic Hospital Association and the American Protestant Hospital Association here present desire to express to the Board of Trustees of the American Medical Association their confidence in the leadership of the medical profession in furthering the excellence of medical service and in aiding the solution of problems of the distribution and provision of medical care.

At a later time the following resolution was approved by all those who participated in the conference:

It is moved that the following be the sense of this meeting:

This gathering of the Trustees of the American Medical Association with representatives of the American Hospital Association, the Catholic Hospital Association and the American Protestant Hospital Association express their gratification on the unanimity of opinion developed concerning many phases of the health problems of the nation achieved by mutual discussion. It is recommended to the American Medical Association, the American Hospital Association, the Catholic Hospital Association and the American Protestant Hospital Association that such joint meetings of their representatives be held for the consideration of problems of mutual concern.

It is the considered opinion of the members of the Board of Trustees that this conference with the representatives of the hospital associations served a most useful purpose in that it provided opportunity for open discussion of important problems and established an understanding which possibly could not have been brought about otherwise.

It was not possible that all matters of mutual interest to those who participated in the conference could be fully considered, nor did it seem wise to undertake at the time to examine minutely the reasons for some possible differences in the policies of all the organizations represented in the conference. There seemed to be unanimous agreement that the physician is supreme in the hospital in all matters pertaining to medical service rendered in hospitals.

As indicated by the terms of the resolution which received the unanimous approval of all present, it is hoped that similar conferences may be held from time to time in the future with the official approval of the American Hospital Association, the Catholic Hospital Association, the American Protestant Hospital Association and the American Medical Association.

The Board of Trustees offers the recommendation to the House of Delegates that such approval be indicated at this session.

Official Contact with Other National Organizations

Various important medical organizations of national scope not officially affiliated with the American Medical Association have within recent years concerned themselves with the consideration of many matters which they had not previously officially considered. It seems to be highly desirable that, so far as possible, concerted effort on the part of all groups interested in the promotion of the art and science of medicine, in the extension of medical service for the benefit of all classes, in improving the methods for applying scientific medical knowledge and in the maintenance of worthy professional ideals should be fully established at the earliest possible time.

For that reason the Board of Trustees has decided to invite the proper official representatives of certain medical organizations of national scope to participate in conferences similar to that recently attended by the members of official bodies of the three national hospital associations. The first invitation was recently extended to the Board of Regents of the American College of Physicians.

Communications from National Medical Association, Inc.

Official representatives of the National Medical Association, Inc., which is the national organization of Negro physicians in the United States, appeared before the Board of Trustees and later before the House of Delegates of the Association at the special session of the House held in Chicago in September 1938.

The National Medical Association, Inc., includes in its membership Negro physicians, dentists and pharmacists. According to the statement of its president, Dr. George W. Bowles, the association has approximately 4,000 members, this number having been determined from the records of the organization in the hands of its secretary. From the same source an estimate is offered to the effect that there are approximately 5,300 Negro physicians in the United States.

The representatives of the National Medical Association addressed the House of Delegates at the special session in September and expressed a desire on the part of the officers of that association to cooperate to the fullest possible extent in maintaining the policies of the American Medical Association as established by its House of Delegates. They asked for such aid as might be extended to them by the American Medical Association in securing recognition of Negro physicians, members of the National Medical Association, by certain agencies of the federal government and of state governments. They also expressed the desire to have the designation "col.," which appears with the names of Negro physicians listed in the American Medical Directory, removed.

The Board of Trustees has given careful and sympathetic consideration to the communications received from the elected officers and other representatives of the National Medical Association, Inc., and will undertake to work out some method for listing Negro physicians in the American Medical Directory in a manner that will not be objectionable to them.

The Board of Trustees desires to submit to the House of Delegates the communications referred to with the recommendation that they be referred to a reference committee for consideration of the points involved.

The president of the National Medical Association, Inc., has been informed that this action would be taken by the Board of Trustees and that the Board believes that the reference committee of the House of Delegates to which these matters may be referred will be glad to have official representatives of the National Medical Association appear before it.

Division of Drugs, Foods and Physical Therapy

The creation of the Division of Drugs, Foods and Physical Therapy has proved to be an effective means of coordinating the work of the Council on Pharmacy and Chemistry, the Council on Foods, the Council on Physical Therapy and the Chemical Laboratory. This Division has also been concerned with the activities of the Advisory Committee on Advertising of Cosmetics and Soaps, the Council's Committee on Contraceptives and the Committee on Medical Patents.

Council on Pharmacy and Chemistry

The year 1938 will be memorable because of the passage by the Congress of (a) the Wheeler-Lea Bill regulating the advertisements of foods, drugs and cosmetic preparations outside the package, including advertising over the radio, through newspapers and even by the spoken word; (b) the Food, Drug and Cosmetic Act, which places in the hands of the Department of Agriculture much more effective weapons to control the supervision of labeling and advertising accompanying the packages of products sold to the public, and also requires disclosure of the contents of preparations; (c) the licensing drug bill providing that no new drug preparation may be placed in interstate commerce after June 25, 1938, until it has received a license from the Food and Drug Administration, which is charged with the duty of determining whether or not the product may be harmful under the conditions recommended. These laws are designed to carry out, to a certain extent, policies similar to those long since established by the Council on Pharmacy and Chemistry and by the Bureau of Investigation. While they do not yet contain some of the provisions which seem to be in order, such as quantitative disclosure of formula, these statutes do clearly recognize the validity of principles maintained by various departments of the American Medical Association unceasingly since 1905, the year in which the Council on Pharmacy and Chemistry was created.

The Food, Drug and Cosmetic Act represents an endeavor to minimize counter prescribing. Physicians should therefore

welcome this opportunity to encourage the proper prescribing of drugs and do all in their power to cooperate with pharmacists against the counter exploitation of drugs used in the scientific practice of medicine. The work of the Council on Pharmacy and Chemistry will be aided in certain directions by force of these new laws, but it will not be lessened. Council recognition of products is coming to mean more and more to physicians and to manufacturers, as is shown by the fact that the work of the Council increases each year. When a drug passes scrutiny of the Council it has shown promise of merit and, if it is accepted, the manufacturer must agree to market it according to claims the Council believes to be justified. The products of certain manufacturers are not recognized by the Council. Few agencies are in position to exercise such discrimination as is shown by the Council in the acceptance of pharmaceutical products. The law now recognizes and provides for the pronouncements of expert medical opinion and it is expected that the opinions of the Council on Pharmacy and Chemistry will have decided influence in helping to formulate decisions on the current use of therapeutic agents. A number of concerns whose products are not recognized by the Council have recently made active progress in revising their catalogues to avoid unfavorable official rulings. It is quite likely that some of these producers will be able to show sufficient revision to warrant the Council's considering certain of their drugs for inclusion in New and Nonofficial Remedies.

On Sept. 1, 1938, announcement was made of the acceptance of products of the Upjohn Company and that company is now cooperating well with the Council. The Council now has catalogues of approximately a dozen manufacturers before it with a view to determining the status of the products of these concerns.

The Council wishes to take this opportunity to express to the members of the American Medical Association its appreciation of the increasing support and recognition which is being given to its work.

INCREASE IN MEMBERSHIP OF THE COUNCIL

Because of the widening field in drug therapeutics it has been necessary to increase the membership of the Council by two members.

PUBLICATIONS OF THE COUNCIL

New and Nonofficial Remedies.—A usual edition of this publication was issued in 1938. Two supplements were issued as usual, one on August 1 and one on November 1. It is to be emphasized that New and Nonofficial Remedies is a current publication, issued annually, the contents of which are being constantly changed to keep in step with the rapid advancement of therapy. The number of copies sold in 1938 was 5,242. In addition 6,300 paperbound copies were distributed to one class of each class A medical school.

The Epitome of the U. S. Pharmacopeia and National Formulary.—It was not necessary to revise this book, since few changes were made in the Interim Supplement issued by the Revision Committee of the U. S. Pharmacopeia or by the Revision Committee of the National Formulary. The demand for the Epitome was very good, the number of copies sold in 1938 having been 7,809.

Useful Drugs.—Useful Drugs has found increasingly wide acceptance among the profession and particularly in the medical schools. In 1938 a new edition was issued. Of late it has been necessary to revise the book approximately every two years. The motto for this book might well be a modification of the old aphorism "It is better to know a few drugs well than many drugs poorly." The number of copies of Useful Drugs sold in 1938 was 7,397.

Glandular Physiology and Therapy.—This book was issued at the close of 1935, after which there was one reprinting. The book is in need of revision and it is anticipated that the new edition will be published during 1940. The number of copies of Glandular Physiology and Therapy sold in 1938 was 710.

A. M. A. Interns' Manual.—This represents a radical revision of a publication previously known as Hospital Practice for Interns. It was issued for the first time in the late spring of

1938. The reception given to the book was greater than was anticipated. In it are contained the official statements from the Council on Medical Education and Hospitals on the relationship of the intern to the hospital, a brief discussion of physical therapy prepared by the Council on Physical Therapy, and a statement on foods and nutrition prepared by the Council on Foods. In addition, there is considerable material on various types of drugs—dosages and indications—which come within the purview of the Council on Pharmacy and Chemistry. This represents truly a cooperative effort of the various councils of the Association in a common field. The number of copies sold in approximately a half year was 1,943.

REPORTS OF THE COUNCIL

The Council issued the usual number of reports. Undoubtedly more interest has been shown in sulfanilamide than in any other drug introduced in medicine during the last few years, and the Council has again revised its description. During the year the Council coined a nonproprietary name for a derivative of sulfanilamide which had been introduced in the United States under undesirable proprietary names. Sulfapyridine, the name coined by the Council, has received wide acceptance. A number of articles which represent extensive work were published by the Council, such as those on the Present Status of Ergonovine, the "new" alkaloid from ergot; Creosote and Guaiacol Compounds, all of which were omitted from New and Nonofficial Remedies; the Present Status of Immune Globulin (Human); the Present Status of Picrotoxin in Poisoning by the Barbiturates, and a number of reports on other substances. Space does not permit detailed statement of the many products and substances which have been passed on by the Council.

COOPERATIVE COMMITTEE ON VITAMINS

The Council on Pharmacy and Chemistry and the Council on Foods have a joint committee on vitamins. Because of the importance of the vitamin problems which were before the councils during 1938 a special meeting of this committee, together with the members of the two councils who are not members of the committee, was called early in December. In order to aid in appreciation of the scope of the discussions, mention is made of the following among the topics presented for action: permissible claims for vitamin A, riboflavin, thiamin chloride, nicotinic acid, cevitamic (ascorbic) acid, vitamin D, vitamins A and D together, viosterol preparations, and vitamin E. The Cooperative Committee of the Councils endorsed the action of the American Society of Biological Chemists and the American Society of Nutrition that the term "vitamin F" be not recognized. It also considered the possibility of reducing the number of types of vitamin A and D preparations by prescribing limits of potency and dosages for different classes of vitamin products. The new problems of nomenclature in relation to vitamins were thoroughly discussed, as were international standards. Other topics dealt with the work of the Council on Foods, such as fortification of various foods with vitamins, and statement of general policy toward such preparations.

Based on these discussions there is to be published in 1939 a review of the action of this committee. Scientifically the conception of vitamins is becoming much clearer and each year brings contributions to the knowledge of the subject. On the other hand, the vitamins have been played up in a grossly unscientific manner to the public. Particularly to be disparaged are the many unnecessary polypharmaceutic preparations containing vitamins, sometimes combined with minerals, which are constantly urged on the public. There is but little need for vitamins as contained in such products and certainly no need medically of complex unscientific mixtures sold under "catchy" names, with misleading claims indicating usefulness in the treatment of various diseases and as cosmetics.

The Council on Pharmacy and Chemistry, in cooperation with the Council on Foods, expects to issue in 1939 a book on vitamins containing the articles published under the joint auspices of these councils. These articles have been thoroughly revised and are being edited by the Secretary of the Council on Foods.

During the year, nicotinic acid was standardized and a number of brands were submitted to the Council on Pharmacy and Chemistry. The Council also has under consideration the newer

addition to the vitamins now called vitamin K. It is encouraging to note that scientific terms are gradually replacing the use of such unsatisfactory designations as are indicated by alphabetic designations. Practically all the known pure crystalline substances are now included in New and Nonofficial Remedies under chemical names.

PROBLEMS OF NOMENCLATURE

The foregoing discussion indicates in a small measure the various problems before the Council. Appreciation of the work of any group having so many questions before it requires a large background of experience. It is therefore sometimes difficult to understand adequately why the Council has been compelled to take this or that action. Practically, most of the complaints that are received in the Council office deal with matters of nomenclature. It is difficult for some persons to see the necessity of not establishing precedents by the use of names which are therapeutically suggestive and that, should therapeutically suggestive names be once recognized, the chaotic condition of nomenclature which was prevalent in 1905 would again be in the course of establishment. The Council is also insistent that there shall be only one proprietary name to any substance and such a proprietary name is granted either because of discovery of a novel preparation or discovery of novel medicinal properties, either of which constitutes a definition for distinct originality.

MEMBERSHIP OF THE COUNCIL

The Council lost by resignation one of its valued members, Dr. E. M. Bailey, who was forced to retire because of illness. Dr. Bailey had been a member of the Council on Pharmacy and Chemistry and of the Council on Foods since 1930. He was chairman of the Committee on Rules and Procedure of the Council on Pharmacy and Chemistry and served admirably as chairman of the Cooperative Committee on Policy, Rules and Procedure, representing the three councils. The members of the Council have recorded their appreciation of the excellent services which Dr. Bailey gave to the medical profession during these years though he himself was not a member of that profession. It is one of the glories of science in general that men of distinction who are not physicians are willing to serve the medical profession unselfishly in its endeavor to promote the best interests of the public and of medicine.

Summary

Important legislation enacted by Congress during the year 1938 included a bill regulating the advertising of foods, drugs and cosmetic preparations outside the package, over the radio and through newspapers, the food, drug and cosmetic act providing for more effective control over the supervision of labeling and advertising accompanying packaged products and requiring the disclosure of the contents of the preparations, and an act providing that no new drug preparation could be placed in interstate commerce after June 25, 1938, until it had received a license from the Food and Drug Administration. These laws are designed to carry out to a certain extent policies similar to those of the Council on Pharmacy and Chemistry and will in some respects offer support to the work of this Council. The law now recognizes and provides for pronouncements of expert medical opinion, and it is possible that the official opinions of the Council on Pharmacy and Chemistry may have some important influence in aiding in the formulation of decisions on the use of therapeutic agents.

Some manufacturers whose products are not recognized by the Council have made revisions in their catalogues for the purpose of bringing them into compliance with newly enacted legislation, and some of these manufacturers may be able to show sufficient revision to warrant consideration by the Council of some of their products for inclusion in New and Nonofficial Remedies.

Increase in the volume of work necessarily undertaken by the Council required the addition of two members.

Publications of the Council have enjoyed fairly satisfactory distribution, and it has become necessary to issue new editions of some of them and to prepare for early revision of others. The issuance of reports

designed to provide the medical profession with information concerning the status of new drugs has been continued.

The Cooperative Committee on Vitamins, a joint committee representing the Council on Pharmacy and Chemistry and the Council on Foods, has been created for the purpose of conducting intensive studies pertaining to vitamins. Under the auspices of this committee, important articles pertaining to vitamins have been prepared and, after publication in *The Journal*, will be brought together for publication in book form.

Council on Foods

It is one of the functions of the Council on Foods to evaluate evidence regarding the nutritional significance of foods and, by means of its seal, to designate as acceptable the claims contained in the advertising of wholesome food products. In this work the Council has continued to receive the cooperation of many producers. Although there has been a limitation in the classes of foods which are accepted, during 1938 approximately 400 products were given consideration. For most of these it was necessary to recommend changes in labeling or advertising or both. Only six products were rejected during the year because firms were unwilling to meet requirements. Thus, it would seem that the work of the Council is bearing fruit, although it would be difficult to obtain an accurate measure of it.

Despite restrictions in the scope of the Council's activities, the labors of its members have greatly increased. The evaluation of scientific evidence and the examination of advertising demand considerable time. During a single month the Council receives approximately 4,000 typewritten pages of radio "continuity" alone. No proper estimate can be made of the amount of advertising for newspapers and periodicals and longer statements such as are contained in booklets and pamphlets that has been given careful consideration. Perhaps the increased powers of governmental agencies provided by the new Food, Drug and Cosmetic Act and the Wheeler-Lea Bill may in time relieve the Council of much of this work and thus permit more time to be spent on the evaluation of scientific and medical data on the value of foods in preserving health.

PUBLICATIONS OF THE COUNCIL

During the year there was prepared for the A. M. A. Interns' Manual a section on Diet and Nutrition. There also was published a pamphlet containing a brief account of some of the principles which underlie the selection of foods for an adequate diet. This pamphlet, entitled "The 'Normal' Diet," was distributed in connection with the exhibit of the Council at the San Francisco meeting. Copies were made available for distribution in reply to the great number of inquiries received by the Council office for information about foods and diet from physicians, students and the general public.

When canned orange juice and other canned fruit juices are substituted for the fresh orange juice which commonly is used in the feeding of infants, there is interest in the vitamin C content of the products. Vitamin C is readily destroyed by oxidation, particularly on heating. Modern canning procedures are designed so as to conserve the vitamin. In order to obtain further information on this point, Dr. E. M. Bailey of the Connecticut Agricultural Experiment Station, New Haven, has supplied for the Council comparative data on the vitamin C content of accepted fruit juices (orange, lemon, grapefruit, pineapple and tomato) determined by the chemical titration method. The Council, in its report, concluded that all of the products examined may be considered excellent sources of vitamin C.

In collaboration with the Council on Pharmacy and Chemistry, arrangements were made for the preparation of a series of articles on the vitamins. These were published during 1938 in *THE JOURNAL*. There were thirty-one articles altogether, which reviewed the chemistry, physiology and dietetic and therapeutic values of each of the vitamins. Judging by inquiries, these authoritative reviews, prepared by leading investigators in the field, have proved to be most useful. Arrangements now have been made for publication of the series in book form.

Progress also has been made in the compilation of material for the book "Accepted Foods."

RULES AND DECISIONS

As information has accumulated regarding foods and their nutritional value, it has been necessary for the Council to revise the requirements for accepted products. Some of the items which have been given careful study are indicated by the changes made in the Rules and Decisions.

The Council has always believed that the ingredients of processed foods should be made known, and particularly of the products intended for special dietetic uses and for feeding infants. Prominent declaration should be made of the ingredients and of the amounts of the essential dietary substances on labels. In accordance with these fundamental policies, the Rules Governing Package Labels and Advertising of special purpose foods have been revised by the incorporation of the following statements:

The labels and advertising shall contain a statement listing all dietary ingredients of nutritional significance in the order of decreasing predominance by weight and shall indicate the special purpose for which the product is intended. These statements, so far as is practical, should be in close proximity to the trade name. In addition, as much of the following information should be given as is significant to permit the intelligent use of the particular product by the consumer: specific properties, vitamin and mineral content, the calories per gram or ounce, and the grams each of carbohydrate, protein and fat per portion.

Claims for the vitamin content of food products intended for therapeutic purposes should be supported by suitable evidence. As a guide to producers and as an expression of Council policy, the following statement concerning the kind of evidence desired together with a general suggestion about how this evidence may be obtained has been incorporated under the Rules Governing Package Labels and Advertising:

In the case of special purpose foods designed to supplement the vitamin content of therapeutic and other diets, satisfactory evidence must be presented that storage under ordinary conditions does not lower the vitamin potency of the product below the assay values claimed. Suitable evidence on this point, for products which ordinarily are kept at room temperature, would be obtained by assay of specimens maintained for three months at a temperature of 100 degrees Fahrenheit. For products which ordinarily are kept in the refrigerator, suitable evidence would be obtained by assay of specimens which have been maintained for suitable periods of time at refrigerator temperature.

The section of the Rules headed "Vitamins" under "Form of Submission of Foods for Consideration" likewise has been amended to read:

Specific vitamin claims must be based on satisfactory evidence, preferably by direct biologic tests of marked samples by a competent investigator. Report of assays should be complete enough to enable appraisal of the work and the deductions therefrom. In the case of vitamin C, chemical titration may be sufficient evidence of the ascorbic acid potency of products for which it has been demonstrated that the chemical method is sufficiently precise. It is important that assay of the vitamin potency of food products be performed on samples which have been kept under conditions of storage comparable to those to which the food product is likely to be subjected.

It was formerly customary to add a small amount of bread crumbs or other cereal food to strained vegetables prepared for use in infant feeding in order to thicken them slightly and to increase their caloric value. The use of cereal in the preparation of strained vegetables for infant feeding has now been largely abandoned, but vegetable soups prepared for infants and young children frequently contain cereal or potato as thickening agents and for the added food value which they supply. Commercially prepared strained vegetable soups with few exceptions contain cereal ingredients in amounts ranging from 1.7 to 12 per cent by weight. The cereals used are chiefly barley, rice and wheat germ. One cereal product only or a mixture of any two or all three of the cereals named may be employed. The nutritional value of the added cereal for healthy babies is recognized.

Because of the small amount of cereal which may be used and the fineness of division of strained foods, the presence of cereal may not be immediately apparent on inspection of the product. The Council believes that the container label of foods should conspicuously present such information as will inform the public of the ingredients of the food within the package. In the case of strained vegetable soups the Council further believes that prominent declaration of the presence of cereal in the product may be of importance to physicians pre-

scribing these foods and the following decision on this point has been adopted:

Added cereal in sieved vegetable soups intended for infant feeding or for special diets shall be given appropriate and prominent declaration on the main panel face of the package label.

The following decision concerning the use of the word "cream" on the labels and in advertising of evaporated milk is self explanatory:

There have appeared on labels and in advertising for various brands of evaporated milk certain statements which the Council believes are undesirable, such as "use evaporated milk instead of cream," "for all your cream needs" and "use as cream." Although evaporated milk is often useful as a culinary aid in situations in which cream is commonly used, the composition of evaporated milk differs from that of cream; statements that imply that evaporated milk is practically the same as cream are nutritionally incorrect and misleading. The claim that evaporated milk has the "consistency of cream" may be correct from a physical point of view; however, the Council regards the expression as objectionable because of the suggestion of similar nutritive properties. The use of evaporated milk in tea, coffee and for other purposes can be suggested without recourse to the word "cream."

GENERAL POLICIES

The funds supporting the work of the Council on Foods come entirely from the American Medical Association. There is no charge of any kind for the seal of acceptance and there never has been.

In order to conserve its facilities, the Council has found it necessary to omit certain foods from its scope. Among the exempted products are well known perishable foods such as fresh fruits and vegetables, fresh meat and eggs and ordinary pasteurized milk. As long ago as 1936 it was found necessary to include individual brands of butter in the exempted list. During 1938 it was brought to the attention of the Council that exemption of butter with continued consideration of oleomargine created a difficulty because of the belief of many that the seal of acceptance constitutes a recommendation. The Council has stated repeatedly that the seal means only that in its opinion the product on which it appears is a wholesome food and that the labeling and advertising comply with Council requirements. It also may be emphasized that the Council gives consideration to so-called educational advertising of trade associations or firms for classes of foods and, on material which is acceptable, permits the display of the seal, usually with an added statement to the effect that the seal denotes that the nutritional claims are acceptable to the Council. With regard to butter, however, the disadvantages of not being able to obtain the seal were felt so keenly by members of the dairy industry that the House of Delegates requested the Council to reestablish suitable standards for the acceptance of butter and the advertising associated therewith. The Council has been spending considerable time in an endeavor to take care of the added work that would be involved and it is expected that some general method of procedure shortly will be devised.

MEMBERSHIP AND CONSULTANTS

During the year the term of membership of Dr. Lydia J. Roberts expired and she was reelected by the Board of Trustees to serve another period of five years. Dr. George R. Cowgill was elected to serve the unexpired term of Dr. Edwin O. Jordan (deceased), and Dr. Irvine McQuarrie was elected to take the place of Dr. Grover Powers, who resigned because of the pressure of other duties. The staff of the Council office remains the same except for the appointment of Dr. Harriet Morgan Fyler to replace Dr. Marjorie Pickens, who resigned to become research associate in the Department of Home Economics, University of Illinois.

The services of the following persons, who were called on as consultants during the year, are gratefully acknowledged: Dr. Walter C. Alvarez, Dr. Hugh R. Butt, Dr. A. J. Carlson, Dr. Henry C. Eckstein, Dr. George B. Eusterman, Miss Mary A. Foley, Dr. Ramon F. Hanzal, Dr. A. C. Ivy, Dr. William E. Krauss, Dr. Grace MacLeod, Dr. E. M. Nelson, Dr. Grover F. Powers, Dr. Henry C. Sherman, Dr. Albert M. Snell and Dr. Genevieve Stearns.

Summary

A review of activities of the Council during 1938 emphasizes again the continued cooperation of members of the food industry. Few products have been accepted

without requiring changes in nutritional claims on labels or in advertising and very few products have been rejected because producers were unwilling or unable to meet the requirements. The newer legislation on foods may enable the Council to concentrate more on the evaluation of scientific and medical opinion on the value of foods in preserving health. Reports of this nature have been published. In a study of the comparative value of the vitamin C potency of canned fruit juices it was found that accepted products compare favorably with fresh juices and rate as excellent sources of the antiscorbutic factor. The Council has prepared brief accounts of the principles which underlie the selection of an adequate diet, one such report having been published in the A. M. A. Internists' Manual. In cooperation with the Council on Pharmacy and Chemistry there was published in *The Journal* a series of noteworthy articles on the vitamins prepared by prominent investigators in the field. These articles now are being collected for publication in book form. There are recorded several revisions in the Rules and Decisions of the Council which were made with the view of having the requirements for accepted products more definite in the light of newer knowledge. The request of the House of Delegates for the reestablishment of suitable standards for the acceptance of butter, and the advertising associated therewith, has resulted in a concentrated effort on the part of the Council to devise some general method of procedure whereby meritorious foods which now are exempted from consideration, because of limitations in facilities, may be given proper recognition.

Council on Physical Therapy

Among important activities of the Council on Physical Therapy within the last year were those concerned with the consideration of radium and radon seeds, roentgen ray apparatus, artificial limbs, hearing aids and the formulation of standards for audiometers, advice in problems of research, a study of radio interference caused by electromedical equipment, revision of the Handbook of Physical Therapy and the booklet "Apparatus Accepted," and the investigation of apparatus. The gathering and dissemination of information that will aid the medical profession in determining the therapeutic value of certain devices and methods employed in the administration of physical therapy constitutes one of the purposes for which this Council was created. Through official reports and scientific articles published in *THE JOURNAL*, conferences with interested groups and a voluminous correspondence, the Council is attempting to accomplish this purpose.

RADIUM AND RADON

After a thorough study of the question of leakage and filtration of radon seeds, the Council is now in a position to go forward with the consideration of these products, using as a guide the report "Radon Seeds," to be published in *THE JOURNAL*. The preliminary work consisted of testing seeds purchased on the open market in a prominent laboratory named by qualified physicists aided by qualified physicians.

In view of the action taken by the House of Delegates at the San Francisco session of the American Medical Association in June 1938 disapproving the rental of radium under certain conditions, the Council is now in a position to proceed with the consideration of the radium products which have come to its attention.

ROENTGEN RAY APPARATUS

The Council is continuing investigations of roentgen ray apparatus with a view to accepting for inclusion in its official lists such apparatus as meets requirements of the Council for that purpose. While it is easily possible to secure satisfactory tests of the smaller equipment of this nature, it is much more difficult to secure the necessary facilities for testing the largest and most powerful roentgen ray machines.

ARTIFICIAL LIMBS

At the suggestion of manufacturers of artificial limbs, a joint meeting of representatives of the Council on Physical Therapy

and of the Association of Limb Manufacturers of America was held in Chicago, at which time the question of sites for amputation, fitting of artificial limbs, standards for acceptance and sales methods were discussed. Articles are now in preparation dealing with these subjects and they will be published in THE JOURNAL.

AUDIOMETERS AND HEARING AIDS

A meeting was held in Chicago at which representatives of the hearing aid industry and consultants for the Council were present. As a result of action taken at this meeting, the "Minimum Requirements for Acceptable Audiometers" were revised and published. Problems discussed at this meeting were (1) the establishment of the energy value for the threshold of hearing, (2) the practicability of fitting hearing aids by means of audiometers and (3) requirements for acceptance of hearing aids. A better understanding of the mutual problems of the otologist and the manufacturers of audiometers and hearing aids was reached.

INTERFERENCE WITH RADIO COMMUNICATION

By mutual agreement the Federal Communications Commission and the Council on Physical Therapy held a joint informal meeting in the Harkness Theatre, Columbia University, New York, in January 1939, at which the problem of interference with radio communication caused by electromedical equipment was given consideration. Attending the meeting were members of the medical profession, representatives of manufacturers of electromedical equipment and of radio manufacturers, officials of the Federal Communications Commission, and other interested groups. At this meeting specialists and engineers in the radio communication field demonstrated interference by short wave diathermy with aural reception and television. The important accomplishment of the meeting was better appreciation of the mutual problems confronting the medical profession and the communication interests. Two solutions were proposed: (1) screening of the treatment room and (2) the allocation of certain radio bands or channels. No definite action was taken, however, since it was believed that further consideration of this problem was necessary.

HANDBOOK OF PHYSICAL THERAPY

The third edition of the Handbook of Physical Therapy has been revised and brought up to date. New articles prepared and included in the volume are on the following subjects: fever therapy, medical diathermy, neutron rays, ultraviolet and infrared radiation, electrolysis, physical therapy in fractures and infantile paralysis, psychoses and neurologic conditions and equipment for physical therapy departments in hospitals. Revisions have also been made in most of the articles retained from the second edition.

INVESTIGATION OF APPARATUS

As usual, much of the Council's time has been concerned with the consideration of apparatus. Of the 100 pieces of apparatus considered, forty were accepted, eleven were rejected, and the remainder were withdrawn from the market or recommendation made that the units be improved and resubmitted to the Council for consideration. A new edition of the booklet "Apparatus Accepted" was published in September, 1938, bringing up to date the information on apparatus that has been reported on by the Council.

GRANTS-IN-AID OF RESEARCH

Several applications were presented to the Council requesting aid in research. Only one application was approved. The Council believes there are many problems in the field of physical therapy deserving careful investigation and will carefully review all requests for grants in aid of research.

EDUCATION

In its educational program, designed to promote sound physical therapy, the Council has had the able assistance of a group of consultants whose efforts have been untiring in this field. Approximately seventy lectures were given and instruction in physical therapy was instituted in three medical schools. Twenty-six articles and three books were published by this group. The members attended fifteen meetings of physical

therapy groups. Efforts to establish an American Board of Physical Therapy culminated in the appointment of a committee to establish such a board which will serve physicians limiting their practice to physical therapy. New departments of physical therapy were established in several hospitals as a result of the Council's efforts.

Five exhibits were shown at various medical meetings, and four new films were prepared on the following subjects: "Aids in Muscle Training," "Underwater Therapy," "Occupational Therapy" and "Massage."

The Council has cooperated with the Council on Medical Education and Hospitals, the American Physiotherapy Association and the American Registry for Physical Therapy Technicians in connection with the consideration of problems concerning educational standards for technicians. It also cooperated with the Section on Ophthalmology of the American Medical Association in the consideration of ophthalmologic devices.

Summary

Briefly, the important work of the Council on Physical Therapy for 1938 has been directed toward the consideration of radium and radon seeds, artificial limbs, audiometers, hearing aids, roentgen ray apparatus, the study of radio interference caused by electromedical equipment, the revision of the Handbook of Physical Therapy and of the booklet "Apparatus Accepted," and the examination of other therapeutic apparatus.

Consultants on audiometers and hearing aids, on artificial limbs, on roentgen ray apparatus and on radium and radon products have cooperated with the Council in connection with the formulation of standards, the preparation of articles and the consideration of apparatus in the respective fields.

The interference with radio communications by electromedical equipment was one of the important subjects coming before the Council. A joint meeting was held at which members of the medical profession, representatives of the manufacturers of electromedical equipment, of radio manufacturers and of other interested bodies, and officials of the Federal Communications Commission were present. Ways and means of solving the problems were considered but no definite action was taken.

The Council on Physical Therapy has revised the Handbook of Physical Therapy and brought it up to date. The booklet "Apparatus Accepted" has been revised and reprinted.

The Council has continued its investigation of and reporting on apparatus submitted and in some instances has investigated and reported on products not submitted.

The Chemical Laboratory

The A. M. A. Chemical Laboratory continued in its important work of cooperating with the Council on Pharmacy and Chemistry in the examination and elaboration of standards for a large number of new preparations or new forms of old preparations offered to the medical profession. It exercised careful scrutiny over all the brands of sulfanilamide submitted to the Council and has examined the products of twenty-two manufacturers. The sulfanilamide now on the market has been found to coincide closely with the standards which were elaborated by the A. M. A. Laboratory in 1937. A good portion of one chemist's time has been devoted to the problems pertaining to crystalline zinc insulin and amorphous insulin, both in the solid form and in solutions in ampules. Nicotinic acid, cevitamic (ascorbic) acid, thiamin chloride, riboflavin and carotene are examples of pure vitamins in crystalline form which have received close attention by the Laboratory. Other compounds of interest are mercurials combined with theophylline, certain estrogenic substances and a number of products containing vasoconstrictors, including ephedrine, propadrine, racéphedrine, neosynephrin and their salts. The Laboratory has found it necessary to continue examination of the various dextrose solutions on the market. A number of revised tests and standards were prepared dealing with products included in New and Non-official Remedies. New barbiturate derivatives and new anes-

thetics have been carefully examined chemically; also a number of contrast substances for the purpose of aiding x-ray diagnosis. Bismuth preparations still demand a great deal of attention.

The Laboratory has examined a number of products for the Bureau of Investigation, which have either been reported in *THE JOURNAL* or are about to be reported.

Members of the Laboratory staff have appeared before a number of scientific societies and have contributed to their programs. Members of the staff have also cooperated with other departments of the Association in the preparation or criticism of material involving chemical considerations.

Councils' Committee on Contraceptives

The Councils' Committee on Contraceptives was organized by the Council on Pharmacy and Chemistry and the Council on Physical Therapy of the American Medical Association at the request of the House of Delegates. The membership of the Committee is as follows: Dr. Paul C. Cannon, Dr. Carl Henry Davis, Dr. A. U. Desjardins, Dr. E. M. K. Geiling, Dr. E. E. Irons, Dr. John H. Musser and Dr. H. B. Williams. Ex-officio members of the Committee include Dr. Sollmann, chairman of the Council on Pharmacy and Chemistry, Dr. Mock, chairman of the Council on Physical Therapy, Dr. Fishbein, Mr. Carter and Dr. Leech.

The Committee on Contraceptives has decided on a general policy of conservative action and will serve largely as a fact-finding body rather than as an advisory body. Recently a report was issued on the use of roentgen rays for contraceptive purposes. An article by Dr. Irving Stein entitled "Contraceptive Methods" has been approved for publication by the Committee. This is a comprehensive review of contraceptive devices which may be harmful. Others have been asked to prepare articles dealing with contraceptive practices.

Advisory Committee on Advertising of Cosmetics and Soaps

The Advisory Committee on Advertising of Cosmetics and Soaps has continued to pass on preparations on which its advice has been requested. There is no doubt that a decided change has been noted in the advertising of many of the cosmetic firms, owing in large measure to the advent of the new Food, Drug and Cosmetic Act but in small measure also to the activities of this Committee. The Committee has been called on for advice from many sources. Although the Committee has not published any articles over its name, it is pleased to report that many of the firms with which it has dealt have revised their literature completely and effectively. In the case of other firms the Committee has been obliged to inform them that their products are not acceptable for advertising in the pages of *THE JOURNAL*. In 1938 the membership of the Committee was increased by two and now consists of Dr. Harry E. Alderson, Dr. Joseph J. Eller, Dr. C. Guy Lane, Dr. Francis E. Seneor and Dr. Bedford Shelmire, with the Editor of *THE JOURNAL* and the Director of the Division of Drugs, Foods and Physical Therapy.

Council on Industrial Health

GENERAL ACTIVITIES

During its first year of organized activity, the Council on Industrial Health has been obliged to devote a major share of its attention to problems of organization and to definitions of the scope of work which it should undertake. In both directions it has had assistance and encouragement from the other established agencies at headquarters. With a view to expediting the ordinary conduct of Council affairs, an office and staff have been organized, rules adopted and subcommittees formed, and a bulletin has been developed by means of which questions of policy may be promptly submitted to the Council. During the year the membership was increased to twelve by the addition of Drs. L. D. Bristol, Anthony J. Lanza and Clarence D. Selby, while one member, Dr. Morton R. Gibbons, resigned.

NOMENCLATURE IN INDUSTRIAL DISEASE

The Council early concluded that the terminology used in industrial medical practice was in large part unscientific, if not chaotic. Usages have been derived from a variety of sources—court decisions, legislative and administrative practice, pronouncements of industrial organizations, and proceedings of technical committees and their publications. It was the opinion of the Council that by reason of this widespread confusion the medical profession needed an analysis of current industrial medical parlance to provide common understanding and acceptance of meanings. A Committee on Nomenclature was appointed to study the problem from a broad point of view and to arrange for the publication of a compendium. In compiling this list and defining its terms, the committee intends to consult with all other interested agencies, including bureaus and councils of the American Medical Association, in order that all possible sources of accurate and competent information may be represented. The publication of this material in book form will provide the profession with a useful reference in a field that has not heretofore been adequately treated.

MEDICAL EDUCATION AND INDUSTRIAL HEALTH

The Council has been impressed by the scarcity of opportunities for training in industrial medicine and hygiene in all categories—undergraduate teaching, organized graduate courses and postgraduate education. The advice and assistance of the Council on Medical Education and Hospitals were solicited and the conclusion was reached that most of the early activities of the Council on Industrial Health could profitably be directed toward the improvement of educational opportunities. Communications have been received from all but two of the four year medical colleges regarding the present status of undergraduate teaching in industrial hygiene and from all known departments in schools of medicine and public health conducting organized graduate courses. Data have been collected and organized in useful form for demonstration and publication. As the study continues, plans will be formulated designed to impress educators with the need of making the profession generally aware of its responsibilities and of the magnitude of its potential contribution to the industrial health program. Likewise, in the conduct of its early survey in the educational field the Council has learned of teaching programs for other than professional participants in the industrial health field which it might profitably explore.

PRODUCTION OF AUTHENTIC LITERATURE

The issuance periodically of authentic articles was considered an important part of the Council's educational program. The first of a series of publications on silicosis has appeared. Arrangements are being made for the preparation and publication of a series of articles covering the administration and maintenance of an adequate industrial medical service, with particular emphasis on the special needs of small industrial plants.

FIRST ANNUAL CONGRESS ON INDUSTRIAL HEALTH

In January 1939 the Council conducted the first of a series of conferences on industrial health. The underlying note of the inaugural meeting was that the practicing physician must attempt to orient himself in a rapidly expanding field. The aims and accomplishments of other organized agencies were clarified and the character of industrial medicine appraised and its scope and interrelationships reemphasized and redefined. The Council considers that this meeting satisfactorily fulfilled its objectives and has gone on record as approving an annual congress as one of its regular educational functions.

CONTACTS WITH STATE ASSOCIATIONS

The Council has been in correspondence with officials of the constituent medical societies in an effort to develop means for regular correspondence and interchange of opinions, preferably by the formation of committees on industrial health in the state societies. In many states the desirability of this arrangement has been realized, and at present twenty-five state medical associations have organized such committees and a few others have signified their intention to cooperate with the Council in this way. In recognition of the importance of these relationships, the Council has appointed a Committee on State Associations, which will have the effect of coordinating the pronouncements and recommendations of the Council with the activities of the state groups.

CIRCULAR HOUSE OF INFORMATION

From the outset it has seemed important to the Council that some arrangement be made for the collection and evaluation of contributions to the literature on the etiology, diagnosis, treatment and prevention of hazards associated with occupation. This activity was originally suggested by the Section on Dermatology and Syphilology. As sources of authentic information improve it is confidently expected that the Council office will be in a good position to satisfy the requirements of physicians who are in need of help in the solution of industrial problems.

REVIEW OF COMPENSATION LAWS

Throughout all the preliminary discussions which led to the creation of the Council on Industrial Health, considerable emphasis was placed on the desirability of uniformity in compensation practice in the various jurisdictions. The determination of a sound approach to compensation activities has given the Council great concern. In this regard special attention has been paid to the functions and accomplishments of other agencies of the American Medical Association which have studied and acted on these matters. At present the conclusion reached is that the Council should concern itself primarily with standards and accomplishments of medical practice under workmen's compensation laws. As one of its important objectives, the Council proposes to determine which of the administrative agencies in charge of workmen's compensation now employ suitable medical representation and in what directions such medical boards could be expanded and their value emphasized.

RELATIONSHIP OF TRAUMA TO DISEASE

Certain instances have come to the attention of the Council in which industrial commissions or courts have ignored or superseded commonly accepted scientific principles and knowledge in making awards, particularly through associating organic pathologic changes with previous trauma or by ascribing aggravation of preexisting disease to trauma. It is not safe to assume that any action taken by a scientific organization will influence these administrative agencies. It is the opinion of the Council, however, that an appraisal or medical survey of the relationship between trauma and disease, approached primarily from the point of view of the pathologist, might constitute a more reliable groundwork of reference which such tribunals ultimately could not ignore. As a preliminary step in this direction the Council has suggested a cooperative survey with the Section on Pathology and Physiology of the Scientific Assembly regarding the relationship between trauma and appendicitis.

REHABILITATION

The Council has been invited to participate in discussions covering the several aspects of vocational rehabilitation. Conferences will probably be called soon looking toward improvement in the contributions of all agencies involved—the rehabilitation groups, the compensation commissions and the medical profession. The Council has been disinclined to assume the initiative in developing conversations designed to clarify and improve the functions of these agencies until a greater degree of information is available, especially on the proper interest which medicine has in the total rehabilitation picture. It is in this phase of the problem that the Council is most likely to interest itself for the time being, in view of its opinion that rehabilitation is not a medical function beyond the provision of adequate medical treatment from the inception of the injury.

MEDICAL ORGANIZATION IN INDUSTRY

Sound opinion concedes that the next great impetus given the industrial health movement will be an effort to provide the employee in the small plant with the same advantages of controlled working environment and scientific preventive medicine as now exist in many of the larger establishments. If this trend is substantially realized, many physicians will be called on to undertake, at least as a part time activity, preventive medical control over small manufacturing plants. Satisfactory results will depend in large measure on the degree to which these physicians have comprehended the fundamentals of industrial hygiene and their practical application of this knowledge. It is the plan of the Council therefore to aid in every ethical way the development of such services to small industries. Arrangements for extension courses and postgraduate education through the state

and county medical organizations will be emphasized. The published reports of the Council will stress the functions of medical organization in industry, the material being so developed as to be ultimately available as a handbook for physicians and industrial executives.

ACTIVITIES OF INDEPENDENT AGENCIES

Many physicians realize the widespread interest in the industrial health movement, but few are aware of the full extent of its complexity and ramifications. There are more than 2,000 trade associations, not a few of which have developed programs for safety and for the elimination of hazards either individually or through established foundations. Dozens of manufacturing concerns, particularly insurance carriers, have in the same fashion supported such enterprises as laboratory and field investigations, code development, determination of safe concentrations of toxic agents and health education in general. Federal and state departments of labor, labor organizations and workers individually are demonstrating increasingly widespread interest in conditions of employment. During the past several years the United States Public Health Service has expanded its facilities for investigation and control of occupational hazards and has fostered the development of bureaus of industrial hygiene in state departments of health and in a few cities. The Council foresees as the basis of one of its most useful functions an ability to inform the profession about the spread of the industrial health movement and to correlate its own program with the programs of independent agencies which have obviously a real interest in and important contributions to make to improved health for the worker.

Summary

The Council on Industrial Health has completed its first year of organized activity and much attention has been directed to internal organization and scope. The establishment of a headquarters office and a bulletin have greatly facilitated the conduct of its affairs. Preliminary work designed to introduce order into the chaotic field of industrial medical nomenclature is approaching completion. Plans are under way to create an abundance of opportunities for sound instruction in the fundamentals of industrial hygiene designed for the undergraduate medical student and for the postgraduate education of physicians. Contacts have been established with all the constituent associations, and committees of industrial health have been established in most of the states where the degree of industrialization seems to warrant it. Steps have been taken to make available authoritative information on clinical and administrative phases of industrial health. Ramifications of medical relationships under workmen's compensation are realized and the Council will work toward uniformity of administration and elevation of medical standards. The Council has instituted an investigation into the relationship between trauma and appendicitis. Its cooperation has been invited to determine the degree of medical interest involved in vocational rehabilitation. Independent agencies interested in industrial health have been investigated and activities of those which have important contributions to make to the health of the worker will be brought to the attention of the medical profession.

Bureau of Legal Medicine and Legislation

FEDERAL LEGISLATION

Seventy-Fifth Congress — The Seventy-Fifth Congress adjourned June 16, 1938. The Federal Food, Drug and Cosmetic Act had then passed both houses. On June 25 it was approved by the President. The act does not become wholly effective until the expiration of one year after the date of its approval, but its provisions relating to new drugs became effective immediately. An analysis of the act was published in *THE JOURNAL*, July 23, 1938, pages 324-326.

During the closing days of the Seventy-Fifth Congress, a bill was passed to amend the United States Employees' Compensation Act so as to give osteopaths the same status under that act as is given to doctors of medicine. It was approved

by the President May 31, 1938. The passage of this bill can probably be attributed to a statement on the floor of the Senate that the medical profession had withdrawn opposition to it. No one authorized to speak for the Association had made any such representation and in fact the bill was as obnoxious as ever. The facts surrounding the passage of the bill were set forth in detail in *THE JOURNAL*, May 28, 1938, page 1838.

Seventy-Sixth Congress.—The Seventy-Sixth Congress convened in its first session Jan. 3, 1939. Already, when this report is being written, March 24, 1939, more than 7,500 bills and resolutions have been introduced and the session is still in progress. Even allowing for the introduction of identical bills in both houses, the volume and diversity of the legislation proposed is flowing, but it is probable that much of it will not be enacted. Abstracts of bills that seem to be of medical interest have been published weekly in *THE JOURNAL*. Among such bills, the following appear to call for special comment:

Wagner Amendment to Social Security Act.—Senator Wagner of New York introduced on February 28 a bill, S. 1620, proposing to expand the Social Security Act so as to give life to the recommendations of the Interdepartmental Committee to Coordinate Health and Welfare Activities, appointed by the President in August 1935. This bill is sometimes referred to as "The Wagner Bill," although its sponsors have selected for it, if it passes, the title "The National Health Act of 1939." The title is obviously adroitly chosen. This bill was referred to the Senate Committee on Education and Labor, where it is pending when this report is being prepared.

While no companion bill has been introduced in the House of Representatives, yet the recommendations of the Interdepartmental Committee to Coordinate Health and Welfare Activities are before the House, having been transmitted by the President Jan. 23, 1939, with the recommendation that they be given a careful study by the Congress. (H. R. Doc. No. 120, 76th Congress, first session.) In the House, the President's message and the report of the Interdepartmental Committee were referred to the Committee on Ways and Means, but up to present writing no action has been taken with respect to them. The essential difference between the situation in the Senate and the situation in the House of Representatives is that the Senate has before it the Wagner bill, proposing specific amendments to the Social Security Act to carry into effect the recommendations of the Interdepartmental Committee, while the House of Representatives has before it only the President's message and the report and recommendations of the Interdepartmental Committee and is left to formulate such legislation, if any, as it deems proper to give effect to those recommendations.

An analysis of the Wagner bill proposing amendments to the Social Security Act, looking toward the extension of medical and health services throughout the United States under the direction and supervision of the United States Public Health Service, the Children's Bureau and the Social Security Board, was published in *THE JOURNAL* March 11, 1939. Essentially, the bill proposes to provide federal subsidies to induce the several states to undertake new activities and to enlarge activities already under way, in certain economic, health and medical service fields named in the bill. The funds to be paid by the federal government toward the state activity are to be matched to a certain extent by funds appropriated by the state. The bill does not propose any specific taxes to cover the cost of the new and enlarged services but leaves the very large expense proposed by the bill to be met by increases in the general taxes or else by savings to be effected by the federal and state governments through the discontinuance or limitation of various federal and state services already under way.

The principal changes in the Social Security Act proposed by Senator Wagner's bill, of medical interest, include the following:

The Social Security Act provides federal subsidies to enable states to extend and improve "services for promoting the health of mothers and children." The pending bill proposes to authorize greatly increased subsidies to be allotted to the states to enable them not only to promote the objects provided for in the existing law but also to "provide medical care during maternity and infancy, including medical, surgical, and other related services, and care in the home or institutions, and facilities for diagnosis, hospitalization, and after care."

The Social Security Act provides for federal subsidies to enable the states to extend and improve services for locating crippled children and for providing medical, surgical, corrective and other services and care, and facilities for diagnosis, hospitalization and after-care for children who are crippled or who are suffering from conditions which lead to crippling. The pending bill proposes to enlarge the coverage to include an extension and improvement of services, supplies and facilities for the medical care of all children, especially children physically handicapped from any cause who are in need of special care.

The Social Security Act authorizes federal subsidies to aid the states, counties, health districts and other political subdivisions to establish and maintain adequate public health services, including the training of personnel for state and local health work. The pending bill proposes to permit allotments only to states and to authorize specifically the making of such allotments "to extend and improve public health work, including services, supplies and facilities for the control of tuberculosis and malaria, for the prevention of mortality from pneumonia and cancer, for mental health, and industrial hygiene activities" and for the development of more effective measures for carrying out such purposes, including the training of personnel. The Social Security Act furthermore authorizes a federal appropriation for expenditure by the Public Health Service for investigation of disease and problems of sanitation. The pending bill proposes to increase this appropriation and to authorize the Public Health Service, through the National Institute of Health, to make investigations of health, disease, sanitation and matters pertaining thereto.

Over a period of three years the pending bill contemplates an increase in federal expenditures of \$196,550,000, exclusive of expenditures for administrative purposes, over the expenditures authorized by the Social Security Act for maternal and child health services, for services for crippled children and for public health work. What the increase in expenditures thereafter will be cannot be determined from the pending bill, because after 1942 no definite amounts are authorized, only as much as may be necessary.

The Social Security Act contains no authorization for appropriations for grants to states for hospitals and health centers. The pending bill proposes to add a new title to the act whereunder grants will be made by the Public Health Service to assist states to establish and improve hospitals and to assist, for a period of three years, in defraying the operating costs of added facilities. For the establishment and improvement of general hospitals the bill contemplates a federal appropriation of \$8,000,000 for the fiscal year ending June 30, 1940, of \$50,000,000 for 1941, of \$100,000,000 for 1942 and of such sums "as may be necessary" thereafter. For mental and tuberculosis hospitals the bill proposes annual federal appropriations of such sums as may be necessary. Within the provisions of the bill, the term hospital is to include health, diagnostic and treatment centers, institutions and related facilities.

The Social Security Act does not authorize any appropriation to assist the states to extend and improve medical care generally. The pending bill does. It contemplates the addition of a new title to the Social Security Act whereunder grants may be made by the Social Security Board to the states to enable them to extend and improve medical care, including all services and supplies necessary for the prevention, diagnosis and treatment of illness and disability, and to develop more effective measures for carrying out the purposes of the new title, including the training of personnel. For the fiscal year ending June 30, 1940, an appropriation of \$35,000,000 is to be authorized for this purpose and thereafter such sum annually as may be necessary.

The Social Security Act does not contain any authorization contemplating cash payments by the states to individuals who are temporarily disabled from whatever cause. The pending bill would add to the act a new title to authorize grants by the Social Security Board to assist the states in the development, maintenance and administration of plans for paying compensation to persons temporarily unable to or unfit for work by reason of injury or illness not arising out of or in the course of employment. For the fiscal year ending June 30, 1940, the sum of \$10,000,000 is to be authorized and thereafter such sum annually as may be necessary. No state may, how-

ever, receive any of the federal funds unless it has a plan or plans that have been approved, presumably by the Social Security Board, under which the board finds that "reasonably adequate medical services, including preventive services, are available to minimize disability among those covered under the state plan for temporary disability compensation."

The Wagner Social Security Act amendment bill was discussed editorially in *THE JOURNAL*, March 11, 1939, as follows:

The House of Delegates of the American Medical Association, in considering the National Health Program, approved expansion of public health service where need could be shown, approved medical care to the indigent and to the medically indigent where need could be shown, and approved even expansion of hospital construction, provided the need could be demonstrated, recommending, however, utilization of existing facilities to the utmost before a new building program was authorized. The House of Delegates also approved the principle of assistance to the worker for temporary disability resulting from illness. Now the Wagner act goes far beyond these recommendations: First, it authorizes the expenditure of vast sums before the need has been shown; second, it expands tremendously the work of the Children's Bureau, the United States Public Health Service and the Social Security Board, without any demonstration that such expansion is warranted; third, it proposes to place the state health officers in a commanding position as far as concerns the dispensing of the funds allotted, subject only to approval of all plans by the federal agency to which the task is assigned. Vast funds are provided for the construction of hospitals and health centers and for their maintenance, notwithstanding the fact that there is not yet available any dependable determination of the exact nature and extent of needs that prevail. Who can imagine for a moment that the money once appropriated will not be expended? Finally, the measure introduces the principle of allotment of federal money to the individual states for medical care, by the Social Security Board, without specifying the means to be used in the individual states for providing such service other than to demand the approval of the Social Security Board.

As is emphasized in the analysis made by the Bureau of Legal Medicine and Legislation, the advisory councils to be set up are vague as to their membership, their duties and their responsibilities. There is one criticism that is to be made above all others in relation to this proposed legislation, namely its extreme vagueness in the light of the vast sums of money to be dispensed and the great powers conferred on certain federal officers in the control of the spending, and particularly the decision as to which of the individual states shall benefit by the expenditures.

Health Insurance.—A health insurance bill entitled "A Bill to aid in alleviating the loss caused by sickness," S. 658, was introduced by Senator Capper of Kansas, identical with a bill introduced by him in the Seventy-Fifth Congress. It proposes to authorize annual federal appropriations of \$200,000,000 to induce the several states to develop and maintain systems of health insurance. The bill follows closely the provisions of the so-called Epstein health insurance bill. It is pending, when this report is being written, in the Senate Committee on Finance.

Tuberculosis.—A bill introduced by Senator Murray of Montana, S. 471, proposes to authorize an appropriation of \$5,000,000 immediately and during the next succeeding four fiscal years unlimited annual appropriations to assist the several states in providing hospital beds for tuberculous persons. Under the provisions of the bill the federal government is to pay to each state which has submitted to the Surgeon General of the Public Health Service plans satisfactory to him 75 per cent of the cost of providing additional hospital beds and in addition a sum not to exceed \$1.25 a day per bed actually operated. A state, to obtain the federal subsidy, must appropriate a sum equal to 25 per cent of the total amount required to provide the added hospital beds, and the state or a political subdivision of it must pay at least 50 per cent of the cost of operation. This bill is pending in the Senate Committee on Commerce.

Narcotic Drugs.—A joint resolution to authorize a survey of narcotic conditions in the United States by the United States Public Health Service, H. J. Res. 103, was introduced by Representative Coffee of Washington and is pending in the House Committee on Interstate and Foreign Commerce. It proposes to authorize the United States Public Health Service to investigate the conditions in the United States "existing now and during the past twenty-five years with respect to the importation, production, distribution, and use of narcotics," in order to obtain information with respect to (a) the extent of unlawful activities in narcotics, and the number of persons connected with such activities; (b) the extent of addiction to the use of narcotics, the number of addicts, the causes of addiction, the availability and use of various kinds of treat-

ment, and other related matters; and (c) the conditions and trends with respect to the prevalence of evils arising from narcotics, with a view to aiding Congress to enact laws and aiding the law enforcement agencies to administer the laws, so as properly to protect the people from such evils. The Surgeon General of the Public Health Service is to report the results of his investigation to Congress, if this joint resolution is enacted, and he is to recommend any necessary legislation.

Medical Care for Transients or Nonresidents.—Two bills, H. R. 2974 and H. R. 2975, were introduced by Representative Voorhis of California proposing to amend the Social Security Act so as to authorize the appropriation of federal funds to assist the states to provide medical care for nonresident needy persons or for needy transients. Both bills are pending in the House Committee on Ways and Means.

Epilepsy.—The creation of a National Epilepsy Institute in the United States Public Health Service is proposed in S. 1557, introduced by Senator Shipstead of Minnesota. This bill, still pending in the Senate Committee on Commerce, is modeled closely after the National Cancer Institute Act, passed by the Seventy-Fifth Congress. It proposes to authorize the institute to conduct researches, investigations, experiments and studies relating to the cause, diagnosis and treatment of epilepsy, to assist and sponsor similar research activities by other agencies, public and private, and to promote the coordination of all such researches and activities and the useful application of their results, with a view to the development and widespread use of the most effective methods of prevention, diagnosis and treatment of epilepsy.

Cancer.—Representative Rogers of Massachusetts has introduced a bill, H. R. 4585, proposing to amend the National Cancer Institute Act so as to authorize an additional appropriation of \$2,300,000 for the fiscal year ending June 30, 1940, and unlimited appropriations annually thereafter, to assist states, counties, cities or other political subdivisions to extend and improve measures through public and private institutions and organizations for the diagnosis, treatment and control of cancer, including the provision of hospital, diagnostic, clinic and other facilities for the diagnosis and treatment of persons suffering from cancer or suspected of suffering from that disease.

Financial Aid to the Disabled.—Nine bills, in addition to the Wagner amendments to the Social Security Act, propose to amend that act so as to provide federal funds to assist states to make cash payments to individuals who are physically disabled. None of these bills propose that medical services be supplied. Under the provisions of five of the bills, H. R. 42, H. R. 1960, H. R. 3999, H. R. 4035 and S. 1218, a person must be permanently disabled before he is entitled to the contemplated benefits of the bill. The other bills, H. R. 172, H. R. 2000, H. R. 2753 and H. R. 5038, make a physical disability or handicap a condition precedent to the receipt of benefits but are not clear as to such disability or handicap being permanent. All the House bills are pending in the House Committee on Ways and Means. The Senate bill is before the Senate Committee on Finance.

Deduction of Medical Expense Under the Income Tax Law.—Two bills have been introduced by Representative Tencrowicz of Michigan proposing to permit federal income taxpayers to deduct in the computation of their income taxes amounts expended during the taxable year for medical services. One bill, H. R. 4747, places a limit of \$500 on the amount that may be so deducted; the other, H. R. 4779, imposes no such limit. Both bills are pending in the House Committee on Ways and Means.

Food, Drug and Cosmetic Act.—Under the new Federal Food, Drug and Cosmetic Act a drug that enters into interstate commerce or commerce in the District of Columbia or other jurisdiction under exclusively federal control must be labeled so as to show its common name or, if it is fabricated of two or more ingredients, its several ingredients. Drugs intended for use by man and containing any quantity of certain narcotic or hypnotic habit-forming substances must be labeled "Warning—May be habit forming." Drugs dispensed on written bona fide prescriptions of physicians, dentists and

veterinarians are under certain conditions exempted from these labeling requirements, except that a drug dispensed in the course of the conduct of a business of dispensing drugs pursuant to diagnosis by mail is not so excepted. This requirement becomes effective June 25, 1939. How many nostrums are sold on the basis of actual diagnoses by mail is not known. The provisions of the new law, however, seem to threaten with particular force one of them, Dr. Nathan Tucker's Asthma Specific, a preparation exploited primarily for the relief of asthma. The preparation is used as a spray and is labeled as containing variant quantities of cocaine per fluidounce, from 5 grains upward, although the proprietors of the nostrum claim that when it reaches the consumer it contains only minute quantities of cocaine, the residue having been converted into ecgonine. Whether it contains any other potent ingredients is not known.

Legislative relief is being sought by the proprietors of Dr. Nathan Tucker's Asthma Specific through H. R. 3951, a bill that proposes to exempt from the requirements that apply to nostrums sold on the basis of diagnoses by mail "a drug prescribed or dispensed by a physician pursuant to a diagnosis made from oral or written information given by the patient and where such drug is not dangerous to health and has been effective in relieving the condition for which it is prescribed in at least one thousand cases per year during the last twenty years preceding the approval of this Act." The effect of the enactment of this bill would be to give to the proprietors of Dr. Nathan Tucker's Asthma Specific a chance to show that cocaine is not dangerous to health or to show that it contains no cocaine and therefore, if labeled as containing cocaine, that it is misbranded under the law; also to show that the extensive use of their nostrum is not due to the habit forming properties of the cocaine put into it or of any derivative of that cocaine. This bill is pending in the House Committee on Interstate and Foreign Commerce.

Social Security Act and Scientific and Educational Organizations.—A bill is pending in the House of Representatives Committee on Ways and Means, H. R. 101, introduced by Representative O'Day of New York, proposing to bring under the old age and unemployment benefit provisions of the Social Security Act organizations operated exclusively for religious, charitable, scientific, literary or educational purposes, and the employees of such organizations. Such employees and their employers will, if the bill is enacted, become subject to the taxes imposed by the act and entitled to such benefits as the act may provide. According to present information, the House Committee on Ways and Means has decided to postpone indefinitely action on this proposed amendment to the Social Security Act, notwithstanding the fact that it has the approval of the Social Security Board.

Legislation Relating to Veterans.—The Seventy-Fifth Congress authorized the House Committee on World War Veterans' Legislation to make a comprehensive survey and inspection of soldiers' hospitals and other Veterans' Administration facilities, including hospitals with which the government has a contract for ex-service men of any war in which the United States was engaged. This investigation was made and a report submitted to the House of Representatives, Jan. 30, 1939. The committee reported that the Veterans' Administration is maintaining a high standard in care and treatment of beneficiaries and is continually studying new diagnostic and treatment methods which may benefit the disabled American veteran. From the contents of the report it would seem that the investigation was primarily for the purpose of inspecting the physical equipment of the various hospitals and the manner in which they are operated. The report contained no recommendation as to the need of additional hospitals. Concerning the number of veterans in such hospitals, the report stated:

Of the 50,670 veterans under treatment at the end of last year, 47,285 were in facilities controlled by the Veterans' Administration; 2,512 in other Government hospitals; and 873 in State or civil institutions. Over 63 per cent of these veterans in all hospitals are receiving treatment in the facilities in the State of their reported home addresses. Since March 3, 1919, when the acquisition of the Government hospitals was first authorized for the treatment of veterans of the World War, there have been 1,863,289 admissions of veterans of the United States to hospitals, of which 152,966 were made during the last year. This load has been increasing since 1919.

As of June 30, 1938, there was in Veterans' Administration facilities a total of 51,991 hospital beds, apportioned to the different classes of patients, as follows: neuropsychiatric, 28,119; tuberculosis, 5,121; general, 11,662; general: homes, 7,089. During the fiscal year 1939 it is proposed to add 3,453 new beds, as follows: neuropsychiatric, 1,334; tuberculosis, 155; general, 1,012; general: homes, 952. During the fiscal year 1940 it is proposed to add 6,731 new beds, as follows: neuropsychiatric, 3,686; tuberculosis, none; general, 2,653; general: homes, 392. If the proposed plans are carried out, there will be available, as of June 30, 1940, a total of 62,175 beds in Veterans' hospitals, as follows: neuropsychiatric, 33,139; tuberculosis, 5,276; general, 15,327; general: homes, 8,433. The present hospital building program of the Veterans' Administration is being carried out under an appropriation of only \$4,500,000 made available directly by the Seventy-Fifth Congress, but this is being supplemented by a sum three times as large, \$13,268,200, donated by the Public Works Administration.

The Administrator of Veterans' Affairs contemplates as an ultimate goal 100,000 beds in Veterans' hospitals, which will make available one bed for every forty veterans throughout the United States. He estimates that the peak load of hospitalization will be reached in 1949 or 1950. What is to become of these hospital facilities as that load declines is not clear, especially in view of the proposal in the pending Wagner bill to amend the Social Security Act that, if the bill should be enacted, may increase the number of beds in government hospitals in the United States within the next three years by as many as 79,000 beds. With an average of 31.1 per cent of the beds in the general hospitals of the United States unoccupied in 1938, the need for any such enlarged hospital program is not apparent.

It is impracticable to discuss in detail the provisions of the various bills now pending in the Seventy-Sixth Congress, proposing to construct either new hospitals or additions to existing facilities. There are pending, however, twenty-one bills proposing (1) to make available a minimum of 2,409 additional beds specifically designated for general medical and surgical disabilities, (2) to construct six new hospitals, with a combined minimum bed capacity of 2,750 beds, for the accommodation of veterans suffering from any type of disability for which they are entitled to hospitalization, (3) to construct a hospital of 200 bed capacity to accommodate veterans suffering from diseases of the chest, (4) to construct a neuropsychiatric hospital to accommodate 400 patients and (5) to construct a 300 bed addition to take care of general medical, surgical and neuropsychiatric disabilities. No action has been taken on any of these bills yet. One of the bills is pending in the Senate Committee on Finance. All others are before the House of Representatives Committee on World War Veterans' Legislation.

Contract and Acting Assistant Surgeons, Spanish-American War.—The injustice that has been done contract surgeons of the Spanish-American War in the matter of pensions continues. As has been previously reported to the House of Delegates, women nurses who served under contract as army nurses in the active military service of the United States during the Spanish-American War are entitled to service pensions; that is, pensions granted them because of disability incurred other than in the line of duty or because of advancing age. Contract women nurses are therefore placed on a parity with the commissioned and enlisted personnel. Contract surgeons, on the other hand, are denied service pensions and remain in a class by themselves. There are pending two bills, S. 259, introduced by Senator McNary of Oregon, and H. R. 2540, introduced by Representative Smith of Washington, which propose to accord contract surgeons of the Spanish-American War the same rights to pensions as are now accorded persons who served in the war under a similar status. These bills are pending, respectively, in the Senate and House Committees on Pensions.

Federal Department of Health.—Three bills are pending proposing to authorize the reorganization of the civil administrative agencies of the executive branch of the government: S. 1706, introduced by Senator Byrd of Virginia, H. R. 4425, introduced by Representative Cochran of Missouri, and H. R. 4893, introduced by Representative Angell of Oregon. None

of these bills, however, either provide for the establishment of a federal department of health or contain any authorization whereby such a department may be created. All three bills, on the other hand, definitely preclude the creation of any new department in any reorganization scheme that may eventuate from them. On March 6, however, Representative Pfeifer of New York introduced a bill, H. R. 4791, proposing the establishment of a federal executive department of health, with a secretary of health at its head, appointed by the President from the medical profession, with the advice and consent of the Senate. The duty of the new department would be to protect and maintain health and sanitation by (1) conducting research, experiments and surveys, formulating and fostering plans, and compiling and disseminating information; (2) performing such other functions relating thereto as shall be authorized by law, and (3) cooperating with official agents established by law in the several states and subdivisions thereof. To this federal department of health would be transferred the Food and Drug Administration of the Department of Agriculture; the Bureau of Census, Division of Vital Statistics, of the Department of Commerce; the Freedman's Hospital and St. Elizabeths Hospital of the Department of Interior; the Children's Bureau of the Department of Labor; and all functions of the Public Health Service and the Bureau of Narcotics, now operating under the Treasury Department, and the Health Department of the District of Columbia. Furthermore, the President would be authorized at any time within ninety days after the passage of the act to transfer to the new department the whole or any part of any bureau, service or other agency of the government primarily engaged in fostering and promoting health and sanitation. The Secretary of Health, according to the provisions of the bill, will be authorized, with the approval of the President, to reorganize or consolidate any of the bureaus, services or offices under his jurisdiction, redistribute the functions thereof, or set up in the Department of Health such subdivisions as may best be adapted for accomplishing the purposes for which the department is to be established. The bill is pending in the House Committee on Expenditures in the Executive Department.

United States Postgraduate Medical and Surgical College.—A bill, introduced by Representative May of Kentucky, H. R. 2423, proposes to establish a United States Medical and Surgical College to be located in the District of Columbia. This bill is identical with a bill introduced by the same author in the Seventy-Fifth Congress. It proposes to authorize an appropriation of \$10,000,000 to construct and equip necessary buildings and the appropriation annually of such sum as may be necessary to carry out the purposes of the bill. Graduates of accredited medical and surgical colleges would be admitted to this so-called medical West Point for training for army, navy or public health work, on designation by Senators and Representatives in Congress. This bill is pending in the House of Representatives Committee on Interstate and Foreign Commerce.

Cooperative Medical Service.—A bill, H. R. 4312, introduced by Representative Hull of Wisconsin, proposes to amend the Code of the District of Columbia so as to provide for the organization and regulation of cooperative associations of various kinds. An association organized under the bill would be authorized to engage in any one or more lawful modes of acquiring, producing, operating, furnishing, exchanging and distributing any type or types of services for the primary and mutual benefit of the patrons of the association, and of the patrons of such patrons, if any, as ultimate consumers. The bill proposes that an association formed under the act which arranges for the rendering to its members of licensed professional services on a nonprofit basis shall not be subject to the insurance laws nor be construed as being in violation of any rule against corporate practice of professions or in violation of statutes regulating licensure of professions. Any group incorporated under any other law of the District of Columbia and operating on a cooperative basis or any unincorporated group operating on such a basis in the District of Columbia is to be authorized to secure the benefits proposed by this bill if it desires to do so. No association, or method or act thereof, which complies with the provisions of the bill is to be deemed a conspiracy or a combination in restraint of trade or an illegal monopoly, or an attempt to lessen competition or

fix prices arbitrarily. This bill was referred to the House of Representatives Committee on the District of Columbia, where it is now pending.

STATE LEGISLATION

Through a legislative reporting service, the Bureau of Legal Medicine and Legislation receives daily when any state legislature is in session notices of bills of interest to the medical profession that have been introduced. Ordinarily such notices are received about the third day after the introduction of the bill and report only its number and title, its sponsor and the committee to which it has been referred. Obviously, a state medical association that maintains its own legislative service at the state capital or has its headquarters there usually obtains such information before the Bureau of Legal Medicine and Legislation in Chicago, but most of our state associations are not so fortunately situated. The Bureau, therefore, immediately on receipt of notice that a bill has been introduced reports its introduction to the president, the secretary and the chairman of the legislative committee of the state association immediately concerned. This reporting in triplicate enables the officers named to confer among themselves at once, even though located at more or less remote places, to determine the policy of their association with respect to the measure.

As soon as possible after the introduction of a bill, the legislative reporting service supplies a copy of it, and it is then analyzed by the Bureau in the light of the laws already in force in the state and of the policies of the American Medical Association. If the analysis shows anything of moment, a letter stating the facts is immediately sent to the secretary of the association, copies of which are sent to the president and the chairman of the legislative committee, for their guidance. In any event, an abstract of each bill that is deemed of interest to the profession in the particular state is submitted to *THE JOURNAL* for publication and published so far as available space in *THE JOURNAL* permits, so that every Fellow of the Association and every subscriber to *THE JOURNAL* may know what legislation is pending in his own state. In this way, interested Fellows and members of the Association in every state, and subscribers to *THE JOURNAL*, learn what is going on more promptly than would otherwise be possible, for the state journals, with only two exceptions, appear only monthly whereas the service rendered by the Bureau, through *THE JOURNAL*, is weekly. A similar service is rendered as the bill progresses toward defeat or enactment; the Bureau receives from its legislative reporting service reports of action by committees and by either branch of the legislature and of the enactment or defeat of the bill, if it reaches a final vote. As has been pointed out, although a few state medical associations are so highly organized and fortunately situated as not to be in need of such service as is described, to a large number of such associations the service seems to be of value.

After the close of each calendar year, the legislation that has been considered by state legislatures that met during the year is summarized and the result published in *THE JOURNAL*, to keep the medical profession of the country informed of the trends of legislation and legislative opinion in the various legislative fields of medical interest. The summary of state legislation for 1938 was published in the Organization Section of *THE JOURNAL*, Feb. 11 and 18, 1939. A brief discussion of some of the most important state legislation considered during 1938 follows.

Laws Relating to the Healing Art.—A new Massachusetts law postponed until Jan. 1, 1942, the effective date of a law enacted in 1936, which was to raise the educational qualifications exacted of applicants for licenses to practice medicine by requiring such applicants to have completed two years of premedical collegiate work and to have graduated from a chartered medical school approved by the secretary of the board of registration and medicine, the commissioner of education and the commissioner of public health. Laws were enacted in Mississippi and New York setting out causes for the revocation, suspension and refusal of licenses in addition to the causes enumerated in the prior laws. An osteopathic practice act passed in South Carolina and osteopaths are now licensed by an unsupervised and uncontrolled board of osteopathic examiners. A resolution was adopted in Massachusetts directing a special unpaid commission to investigate the advisability of establishing an independent board of examination and registration in osteopathy and a similar board in chiropractic.

Contraception and Venereal Disease Prophylactics.—A new Kentucky law prohibits the retail sale or distribution of appliances, drugs or medicinal preparations intended or having special utility for the prevention of venereal diseases, except by licentiates of the state board of pharmacy and licentiates of the board of medical examiners regularly licensed to practice medicine.

Laws Designed to Combat Syphilis.—Laws were enacted in New Jersey, New York and Rhode Island to require every physician attending a pregnant woman to take a sample of her blood and to make or cause to be made a standard serologic test for syphilis. Laws to require, as a condition precedent to the issue of marriage licenses, that both parties to the proposed marriages present certificates from physicians that they are free from stated venereal diseases were enacted in Kentucky, New Jersey, New York and Rhode Island.

Compulsory Health Insurance.—Bills proposing the establishment of systems of compulsory state health insurance were considered in 1938 in Massachusetts, New York and Rhode Island, but all these bills failed of enactment. All were patterned closely after the so-called Epstein social security bill for health insurance. However, a new New York law created a state commission to study and recommend ways and means of minimizing risks of illness through the extension of public health services; for furnishing adequate medical care for persons of low income, which have to be met from public funds; for making public funds available for the support of medical education and for studies for raising the standards of medical practice; for medical care to the indigent; for using private institutions in allocating public funds for the rendition of medical service to the public; for effecting adequate administration and supervision of the health functions of the state government, and, if deemed advisable, for consolidating under a separate department all federal and state health and medical services and activities. This commission was directed to report to the legislature before Feb. 15, 1939, but the New York legislature in 1939 was asked to extend its existence for another year for the purposes stated.

Hospital Service Corporations.—Laws were enacted in Kentucky and New Jersey authorizing the formation of corporations to provide on a so-called "nonprofit basis" "hospital care" to their members or subscribers. The activities of such corporations under these laws would seem to be limited to the rendition of hospital care and not to include medical or surgical care. A new Louisiana law provides for the formation of so-called service companies, authorized to make agreements with members or subscribers to furnish hospitalization and incidental drugs on the occurrence of sickness or other physical disability of a member or subscriber. Whether such companies may also contract to furnish medical care is not clear from a perusal of the law.

Narcotic Drugs.—The uniform narcotic drug acts in force in Louisiana and New Jersey were so amended in 1938 as to make cannabis or marihuana a narcotic drug within the meaning of the acts. The New York uniform narcotic drug act was so amended as to redefine cannabis.

Vaccination.—A new Virginia law authorizes local boards of health, in addition to rights previously possessed at law, to require, whenever they deem it necessary to prevent an epidemic, the compulsory administering of toxoids.

Workmen's Compensation.—So far as can be ascertained, no workmen's compensation legislation of interest to the medical profession was enacted in 1938.

Pneumonia Control Program.—A total of \$35,000 was appropriated in New Jersey for the purchase and distribution of type I and type II pneumonia serum to be available free of charge to persons afflicted with pneumonia and financially unable to purchase the necessary serum.

STATE LEGISLATION BY INITIATIVE

In some states, chiefly in the West and Southwest, the constitution permits the electorate to enact legislation directly through their votes at the polls and not through the legislature, a process that is commonly referred to as the initiative. Sometimes procedures have been instituted under the initiative to accomplish purposes that would hardly have received serious consideration. The chiropractic and osteopathic initiative acts adopted in California by the initiative in 1922 illustrate this point. In recent years, cultists in states in which the procedure

is possible have with increasing frequency resorted to the initiative to gain for themselves advantages that they could not have hoped to gain through the legislature.

In 1938 four initiative proposals were pending which, if adopted, would have jeopardized the public health and welfare in those states. Two of these measures were voted on at the general elections in November 1938. Fortunately neither was adopted.

In Colorado the electorate decisively rejected an initiative measure advanced by the chiropractors, which, while proposed by them primarily to protect themselves from regulation by the legislature, would have weakened the other laws of the state, those relating to the practice of the healing arts, and would have produced chaotic results in the fields of medicine and public health.

The California electorate rejected an initiative measure designed to hinder the use of living dogs for purposes of research. This measure proposed to forbid the delivery of any living dog from any pound in the state to any institution of learning or research for purposes of study or instruction.

In Oklahoma an initiative measure was inaugurated which proposed to amend the medical practice act so as to permit hospitals and clinics organized on a mutual or cooperative basis to enter into contracts for hospital or medical services and to prevent the board of medical examiners from disciplining licensed physicians who cooperated in such schemes. The people of the state, however, did not vote on this measure, since at the time of the election an appeal was still pending in the Supreme Court of Oklahoma to determine the regularity of the petition on the basis of which it was proposed to put the initiative measure on the ballot. A bill is now pending (March 22, 1939) in the Oklahoma legislature which, if enacted, will accomplish the results aimed at by the proposed initiative measure.

In Ohio a contemplated chiropractic initiative measure somewhat similar to the Colorado chiropractic initiative was considered, but its proponents never carried it to a point at which the electorate might pass on it. The cultist sponsors of this measure apparently became disheartened shortly after they had submitted it to the attorney general for his approval as to form and never offered petitions with a sufficient number of signatures to entitle the measure to a place on the ballot.

COOPERATION APPRECIATED

The Board of Trustees, on behalf of the Bureau of Legal Medicine and Legislation, expresses appreciation of the cooperation that the Bureau has received from the several state constituent medical associations and component county medical societies and from individual physicians.

Summary

Federal Legislation.—Seventy-Fifth Congress: The new Federal Food, Drug and Cosmetic Act was approved by the President June 16, 1938, and the provisions of it relating to new drugs became effective immediately. The other provisions will become effective June 25, 1939. Under the provision of a law enacted by the Seventy-Fifth Congress, osteopaths are given the same status as doctors of medicine under the United States Employees' Compensation Act.

Seventy-Sixth Congress: The Wagner bill to amend the Social Security Act proposes to give life to the recommendations of the Interdepartmental Committee to Coordinate Health and Welfare Activities. Essentially the bill proposes to provide federal subsidies to induce the several states to undertake new activities and to enlarge activities already under way in certain economic, health and medical service fields named in the bill. The Capper sickness insurance bill contemplates a federal appropriation of \$200,000,000 annually to induce the states to develop and maintain systems of health insurance.

Other federal subsidies are proposed in pending bills to enable states to provide hospital beds for tuberculous persons, medical care for transients or nonresidents, financial aid to the disabled, and to improve measures for the diagnosis, treatment and control of cancer.

A survey of narcotic conditions is proposed in a pending measure, and the creation of a National Institute of Epilepsy similar to the National Cancer Institute is contemplated by another bill. Other federal proposals

would authorize federal income tax payers to deduct the amount expended for medical services and would amend the Federal Food, Drug and Cosmetic Act for the relief of a nostrum exploited for the relief of asthma.

A proposal to bring under the old-age and unemployment provisions of the Social Security Act organizations operated exclusively for religious, charitable, scientific, literary or educational purposes has been indefinitely postponed by the House Committee on Ways and Means.

The House Committee on World War Veterans' Legislation has filed a report of its investigation of veterans' hospitals but recommended no increase in beds. The present building program is being carried out with the aid of more than \$13,000,000 obtained by the Veterans' Administration from PWA. Proposals continue to be made to Congress for the construction of new hospitals. The injustice that has been done to contract surgeons of the Spanish-American War continues.

Three bills propose the reorganization of the civil administrative agencies of the executive branch of the government but none provide for the establishment of a federal department of health or contain any authorization whereby such a department may be created. A pending bill, however, does propose the establishment of such an executive department with a secretary of health at its head. Another bill proposes the establishment of a United States Medical and Surgical College to be located in the District of Columbia, in which graduates of accredited medical and surgical colleges will be trained for army, navy or public health work.

The incorporation and the legalization of cooperative medical service organizations in the District of Columbia is contemplated by a pending bill.

State Legislation.—During the year, as it has done in prior years, the Bureau kept constantly in touch with state legislation of medical interest, promptly advising state associations of legislative proposals that seemed to be of particular importance. Compulsory health insurance proposals were defeated in Massachusetts, New York and Rhode Island, but a commission was created in New York to study the matter and to report back to the legislature. Hospital service corporations were authorized in Kentucky, Louisiana and New Jersey. Other legislation enacted in one or more states related to osteopathy, chiropractic, venereal diseases, narcotic drugs, vaccination, pneumonia control, educational qualifications of applicants for licenses to practice medicine and the causes for which such licenses may be revoked.

State Legislation by Initiative.—Initiative measures in California and Colorado that would have jeopardized the public health and welfare of those states were decisively rejected by the people. Proposed initiative measures in Oklahoma and Ohio did not appear on the ballot.

Bureau of Health Education

By action of the House of Delegates at the San Francisco session, the name of the Bureau of Health and Public Instruction was changed to Bureau of Health Education. This change was made in the interest of simplicity and to minimize the occurrence of erroneous identifications of the Bureau.

CORRESPONDENCE

The correspondence handled through the Bureau continues to be divided into two main groups, which are called, for convenience, Bureau correspondence and Question and Answer correspondence. The number of letters handled under each heading was Bureau, 5,474, Question and Answer, 8,220, Radio Audience Mail, 1,145. In Bureau correspondence an increase is noted of 17 per cent over 1937, the 1937 increase over 1936 was 13 per cent.

Question and Answer correspondence in 1938 showed a decrease of 16 per cent, whereas in 1937 it increased 26 per cent over 1936. The 1938 decrease is accounted for by the absence of world's fairs or major expositions. American Medical Association exhibits at such expositions always stimulate correspondence. In 1937 fairs were in progress at San Diego,

Dallas and Cleveland. The normal unstimulated correspondence actually showed an increase in 1938 of 4 per cent over 1937.

Radio audience mail can be controlled by the practice of asking or not asking for correspondence in connection with broadcasts. The relatively small volume of audience mail in 1938 is due entirely to the fact that no inducements were offered to the radio audience.

RADIO PROGRAM

The radio program *Your Health*, in cooperation with the National Broadcasting Company, was broadcast from January 1 through June 15 to complete the first series of special programs for schools. A new series was authorized by the Board of Trustees early in 1938 and was put on the air beginning Oct 19, 1938. This was based on the same principle as the first series of special programs for junior and senior high schools. Therefore, the radio briefs which had been published in *HYGEIA* from October 1937 through June 1938 were not republished, but listeners were referred to file copies of *HYGEIA* for these briefs and only a much abbreviated radio announcement was carried in *HYGEIA* each month from September through December 1938.

The usefulness of this program to the schools was indicated by the fact that in the latter weeks of summer and the weeks of school openings numerous letters from school principals, health supervisors and science teachers were received asking information as to when the program would be resumed.

Sixty National Broadcasting Company stations regularly broadcast the program.

The Woman's Auxiliary gave its customary cooperation in publicizing the radio program locally, as did many state and county medical societies.

The workbook "*Your Health*," published by the Johnson Publishing Company to coordinate with the program, was reissued in a 1938-1939 edition practically identical with the edition of 1937-1938.

A broadcast on "Medical Care" was given over the Blue network of the National Broadcasting Company by Dr. Irvin Abell, President of the Association, September 17, during the special session of the House of Delegates.

The *Your Health* program received a first award from the Institute on Radio in Education at its ninth annual meeting in Columbus, Ohio, in May. At this meeting transcriptions of broadcasts were heard by the Committee on Awards, and the superior quality of the *Your Health* program was recognized by this award.

The radio library maintained by the Bureau for the use of state and local medical societies and of organizations whose use of the material is approved by local medical societies was called on by such organizations during 1938 for 5,540 scripts, as compared with 4,589 in 1937 and 3,388 in 1936. In 1938, 128 county medical societies used the scripts, as compared with seventy-two in 1937. In 1938, twenty-one state medical associations used the scripts, as compared with thirteen in 1937.

In order to keep the script library up to date, 100 older manuscripts have been dropped and 123 new ones added, making a total of 876 titles, of which 351 are for fifteen minutes, 196 for ten minutes and 329 for five minutes.

Advice and suggestions with regard to outside radio programs were given in sixty-two instances. Among the most important instances of cooperation in 1938 was included the development of a radio broadcast complimentary to the medical profession by the famous radio team of Lum and Abner in which the Bureau was assisted by the executive secretary of the Los Angeles County Medical Association.

A special dramatized broadcast on infantile paralysis was put on the air and transcribed for repeated local use on December 19 in cooperation with the National Broadcasting Company and the National Foundation for Infantile Paralysis, affiliated with the Committee for the Celebration of the President's Birthday.

The evaluation project by the Committee on Evaluation of the Federal Communications Commission, with headquarters at Ohio State University, continued through the year. The evaluation was hampered during the last half of the year by the absence of a Chicago outlet for the program *Your Health*.

PROTECTION OF RESEARCH

The Bureau has continued its cooperation with the Committee for the Protection of Medical Research under the chairmanship of Dr Elliott C Cutler

The Bureau made its usual donation in May to graduating medical students of complimentary copies of the pamphlet *Animals in Research*. This was accompanied by a copy of the Bureau of Medical Economics' pamphlet *Economics and the Ethics of Medicine*. The *Animals in Research* pamphlets distributed totaled 5,430, and the pamphlets on medical economics 5,342.

COOPERATION WITH GOVERNMENTAL AGENCIES

The Bureau is frequently called on for advice, consultation and cooperation by public agencies, including departments of the federal government, state health and education departments and the health departments, school boards and libraries of municipalities. The states and their subdivisions to which service has been extended are too numerous to list, but the federal departments and the divisions of these which have called on the American Medical Association for service through this Bureau alone are as follows:

United States Department of Labor
Children's Bureau
United States Department of the Interior
Office of Indian Affairs, Pine Ridge, S. D., Window Rock, Ariz.,
Ignacio, Calif., and Fort Wingate, N. M.
Office of Education
Bureau of Mines
United States Department of Commerce
Bureau of the Census
Accident Prevention Conference
United States Treasury Department
Bureau of the Public Health Service
Surgeon General
Library
Office of Health Education
Advisory Cancer Council
Division of Sanitary Reports and Statistics
National Institute of Health, Division of Zoology
United States Department of Agriculture
Cooperative Extension Work in Agriculture and Home Economics

The Director of the Bureau continues as a member of the General Advisory Committee on Maternal and Child Health and Crippled Children's Work. Two meetings of the committee were held during 1938, at which the Bureau was represented.

COOPERATION WITH LAY ORGANIZATIONS

National Congress of Parents and Teachers—There have been no new developments in 1938 in the cooperative relationships with the National Congress of Parents and Teachers. There is slow but steady progress toward more widespread adoption of the congress policy for the examination of children in physicians' own offices, such examinations to be paid for by parents where possible, otherwise to be done gratis and in a few instances paid for by local parent-teacher associations. Such payment is usually made on the initiative of the parent-teacher association.

The usual authorization was given by the Board of Trustees for the printing of examination blanks, one half to be paid for at cost by the National Congress of Parents and Teachers, the other half donated by *HYGIEA*, the Health Magazine.

The Advisory Committee to the Summer Round-Up held its usual meeting in January for the consideration of business relating to the summer round-up, but there was nothing in that meeting worthy of special note.

General Federation of Women's Clubs—A meeting of the Advisory Committee of the General Federation of Women's Clubs was held Jan. 14, 1939. The clubs continue their work in the child welfare, syphilis education and cancer education programs. The Director of the Bureau was made a member of a special subcommittee to consider further revision of the blanks previously developed for community health surveys by women's clubs, but no conclusion has been reached by the committee. Since this study has attracted little or no attention among women's clubs, it is possible that it may be dropped from the program.

A new president, Mrs. Saidie Orr Dunbar of Portland, Ore., took office and appointed a new chairman for the division of public health of the federation, Mrs. Margaret Wells Wood

of the Illinois State Department of Health, Springfield. The Director of the Bureau of Health Education has been reappointed as a member of the advisory committee.

4-H Clubs (National Committee for Boys and Girls Club Work)—In the annual "Healthiest Boy and Healthiest Girl" contests for 1938, four boys and four girls were named in each of just one boy and one girl as has been the case in the past. Director C. W. Warburton of the U. S. Department of Agriculture, Extension Division, has expressed a special interest in arranging contests so that more benefits will accrue to boys and girls who participate but do not win prizes.

Joint Committee on Health Problems in Education—The year 1938 was marked by two significant developments in relation to the Joint Committee.

(a) The announcement at the February meeting by Dr. Thomas D. Wood, chairman of the committee for twenty-six years, of his intention to resign, followed by his actual resignation in July.

(b) The appointment, immediately on Dr. Wood's announcement, of a subcommittee to plan for the reorganization of the Joint Committee; these appointments were made by Dr. Charles C. Wilson, Hartford, Conn., vice chairman of the Joint Committee.

Dr. Wilson has functioned as acting chairman of the committee since Dr. Wood's announcement of his resignation. The subcommittee to plan for reorganization consists of Dr. Thurman B. Rice, Indianapolis, chairman; Miss Mary Murphy, Elizabeth McCormick Memorial Fund, Chicago; Miss Anne Whitney, Newton, Mass.; Supt. Willis A. Sutton, Atlanta; and Dr. W. W. Bauer, Chicago.

The deliberations of the committee resulted in agreement on a tentative set of simple principles under which the present Joint Committee will cease to function when these principles have been adopted and will be replaced by a new Joint Committee, smaller in number with more flexible organization and more likely to be responsive to changing needs of changing times.

At the meeting of the Joint Committee at Cleveland in February 1939, the reorganization was completed, providing for a committee of ten members, five from the National Education Association and five from the American Medical Association. Terms of these members are to be as follows: initial terms, respectively, one, two, three, four and five years, subsequent terms, five years each, maximum, two terms in succession. A chairman, vice chairman and secretary-treasurer are to be elected annually by the committee from among its members using the Hare system of proportional representation. The scope of the committee was defined and an operating code of broad and elastic principles was adopted. The committee is to be strictly a Joint Committee of the two organizations, excluding from its membership all other organizations, but the committee is to draw freely on other organizations for consultants and advisory subcommittees. Consultants and advisers are to have no vote in the Joint Committee. All actions of the committee must be adopted by a vote of four fifths, except mail votes, which must be unanimous. There shall be a quorum at meetings unless there are seven members present of whom at least three shall be from one of the participating organizations.

SYMPOSIUM ON HEALTH PROBLEMS IN EDUCATION

A second Symposium on Health Problems in Education under the sponsorship of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, together with the Section on Pediatrics, the Section on Preventive and Industrial Medicine and Public Health, the Section on Ophthalmology, and the Section on Laryngology, Otology and Rhinology of the American Medical Association, was held in the City Health Building, Civic Center, San Francisco, June 14. This auditorium, seating 300 persons, was believed ample in size, but it was found necessary to turn away more than 300 teachers and physicians who wished to attend the symposium. Another symposium has been arranged for the American Medical Association meeting at St. Louis in May 1939.

American Public Health Association—The Director of the Bureau continues to serve his five year term, of which two

years remain, as a section counselor of the Section on Health Education of the American Public Health Association.

The American Public Health Association at its Kansas City meeting adopted a resolution which has been published in *THE JOURNAL* (Nov. 5, 1938, p. 1775) and which did not endorse the so-called health insurance proposals of the plans of the National Health Conference held in Washington in July.

Other Cooperative Relationships.—The Director of the Bureau was appointed by the Executive Committee of the Board of Trustees to represent the American Medical Association on the Section Committee on Minimum Requirements for Plumbing and Standardization of Plumbing Equipment. This committee is sponsored by the American Society of Mechanical Engineers.

Other organizations with which regular cooperative relationships are being maintained include:

State and Territorial Health Authorities (guest representative at meetings).

United States Public Health Service (participation in health conferences on invitation).

United States Department of Commerce (accident prevention conference).

National Organization for Public Health Nursing (consultant).

Committee on Evaluation of School Broadcasts of Federal Communications Commission (Ohio State University).

COOPERATION WITH STATE AND COUNTY SOCIETIES

The Bureau continues as in the past its endeavors to function as a clearing-house for health information and ideas for county and state medical societies and to establish and further cordial relationships between the medical profession and other organizations working for similar purposes.

PERSONAL APPEARANCES

Addresses to assembled audiences by the Director in 1938 numbered ninety-nine and by the Assistant Director fifty-eight, a total of 157. This compares with 125 addresses in 1937. These appearances required 42,859 miles of travel by railroad, automobile and bus. Appearances were made in twenty states.

The number of invitations has steadily increased and it is always necessary to decline a considerable number because of schedule conflicts and for other reasons.

HYGEIA CLIPPING LOAN COLLECTIONS

The clipping loan service of *HYGEIA* material bound into folders and accompanied by an outline for a proposed speech increased remarkably in 1938, owing largely to the publication in *THE JOURNAL* of an article "When Doctors Address the Public," by Dr. Paul A. Teschner, March 12, 1938, p. 155B. The total number of loans in 1938 was 895, as compared with 375 in 1937 and 230 in 1936.

BUREAU PUBLICATIONS

The pamphlet publications of the Bureau were maintained as in past years by revising, dropping or adding, as the demand seemed to indicate. New Bureau publications numbered twelve; those revised numbered five.

The use of photographic covers on *HYGEIA* suggested to the Director of the Bureau that these cover plates could be put to further use by employing them as a basis for posters. These posters were developed with special reference to economy, attractiveness and usefulness in the classroom. Therefore they were printed on lightweight paper so that they could be sold and mailed at a price of 25 cents for eight, including postage.

Material for publication in *THE JOURNAL* and in *HYGEIA* has been prepared by the personnel of the Bureau as occasion has demanded.

REVISION OF THE PERIODIC HEALTH EXAMINATION MANUAL

Revision of the Manual of Suggestions for the Conduct of Periodic Examination of Apparently Healthy Persons was authorized by the Board of Trustees and is in progress.

EXHIBITS

The Bureau cooperated, as in former years, with the Bureau of Exhibits in the preparation of exhibit material for use on various occasions, the principal ones being the Golden Gate International Exposition and the New York World's Fair.

Summary

The Bureau handled 5,474 communications from doctors, medical societies and cooperating agencies, 8,220 inquiries from the lay public and 1,145 pieces of radio audience mail. The Bureau broadcast thirty-seven dramatized radio programs in cooperation with the National Broadcasting Company. The radio library furnished scripts to 128 county medical societies and twenty-one state medical associations, distributing a total of 5,540 scripts covering 876 titles. Special radio broadcasts were arranged in connection with the annual session at San Francisco and the special session of the House of Delegates at Chicago. The Bureau cooperated with the Committee for the Protection of Medical Research and distributed 5,430 copies of pamphlets on protection of medical research to senior medical students; these were accompanied by an equal number of pamphlets on medical economics. Cooperation was given to five major departments of the United States government. The Bureau represented the American Medical Association in cooperative projects with the National Congress of Parents and Teachers, the General Federation of Women's Clubs, the National Committee for Boys and Girls 4-H Club Work, the National Education Association, the American Public Health Association, State and Territorial Health Authorities, National Organization for Public Health Nursing and the Federal Communications Commission's Committee on Evaluation of School Broadcasts. Public addresses were given to 157 audiences in twenty states, requiring 42,859 miles of travel; these audiences numbered 45,786 persons. Clipping loan collections from *Hygeia* were furnished to 895 doctors in forty-six states to aid them in preparing addresses for the public. The Bureau issued twelve new pamphlets and revised five old pamphlets. Eighty-two items were contributed to *The Journal* and thirty-four to *Hygeia*. Revision of the periodic health examination blank and manual was begun. The Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association was completely reorganized.

Bureau of Medical Economics

A number of phases of medical economics were under consideration during 1938. The study of medical care proceeded throughout the year; reports of the National Health Survey and the text of the National Health Program have been analyzed; assistance has been given to medical societies on the study and preparation of medical service plans; group hospitalization plans have continued to demand study and criticism; data have been assembled for the study of fee schedules, and other subjects such as collection of medical fees, sickness financing, malpractice insurance, workmen's compensation, relations between physicians and hospitals, the preparation and revision of publications of the Bureau and field engagements have consumed the time of the Bureau personnel.

STUDY OF MEDICAL CARE

In compliance with the resolution adopted by the Board of Trustees in December 1937 calling for a study of the need and supply of medical care and in accordance with the suggestions of the Committee on the Study of Medical Care, the Bureau of Medical Economics prepared nine forms to be used by county and state medical societies in the collection of data for such a study of medical care. Two information booklets containing suggestions on the conduct of the study and a special Summary Sheet were also prepared to make possible the collection of somewhat uniform information by the committees appointed by county medical societies to conduct the study. Also a special form was prepared for the use of state medical societies in the collection of information concerning statewide medical facilities. In all, the Study of Medical Care necessitated the preparation and distribution of 280,000 pieces of material.

The Committee on the Study of Medical Care recommended a special study of free services rendered by physicians and dentists throughout the United States. Records of free medical

services were prepared to be kept for one week by physicians and by dentists during each of three periods selected to obtain a representative sample of the services rendered during a year. For the conduct of this special study, 496,000 records were distributed to physicians and dentists.

As of Feb. 28, 1939, 416 county medical societies in thirty-six states have completed the Study of Medical Care in their counties and returned to the Bureau of Medical Economics the Summary Sheets with information obtained in the study. Many of the committees in charge of county studies returned detailed reports based on the findings of the study and including recommendations for the improvements that seemed necessary. In six states the returns are complete for all the counties in the state. Four state medical societies have also returned the special form which contains information regarding statewide arrangements for medical services.

Medical societies in forty-five states and the District of Columbia are participating in the Study of Medical Care, and it is expected that an additional number of medical societies will complete the Study of Medical Care at a later date.

Only two of the three periods to be included in the special study of free medical services have been completed, but as of Feb. 28, 1939, 434 counties have returned approximately 8,000 forms which represent the actual records of free medical services rendered by physicians and dentists. These records are being prepared for machine tabulation on punch cards, and more than 5,000 have been checked and are ready for tabulation. Twelve of the county and state reports have been published in the Organization Section of THE JOURNAL to indicate the nature of the information received and to encourage committees in charge of the Study of Medical Care to prepare complete reports.

MEDICAL SERVICE PLANS

During the past year there has been a noticeable increase in the activities of county and state medical societies in the study and development of medical service plans. The impetus for these activities may have come partly from the distaste on the part of the medical profession to a form of medical practice organized and operated by some nonprofessional agency, either voluntary or governmental, and partly from the encouragement given by the House of Delegates to medical societies to develop for local communities supplementary arrangements for the distribution of medical services according to local requirements and conditions.

The House of Delegates in 1934 established ten principles to assist medical societies in the organization of arrangements to supplement the private practice of medicine. The Study of Medical Care has developed data that in some instances have also brought to the attention of the organized medical profession problems in the distribution of medical services that deserve careful sympathetic consideration. These and other factors, not the least of which is the National Health Program, have focused the attention of both the medical profession and the public on "plans" to facilitate the distribution of medical care.

Interest in Medical Care Plans.—Since the Special Session of the House of Delegates in September 1938 some forty or more medical societies have sought assistance in the study and development of forms of medical service suited to their respective localities.

The growing interest of medical societies and of the public in special arrangements for organizing payments for medical services can be almost directly measured by the increasing number of experiments conducted by state and county medical societies. In 1934, 150 plans for the distribution of medical services were being conducted by medical societies in various communities in the United States. By 1935 this number had grown to 200, by 1936 to 250, by 1937 to 350, and at present the number is in excess of 450.

The existence of these organizational plans for the delivery of medical services is a direct refutation of the assertions that have been made concerning the unwillingness of the medical profession to tolerate change in the arrangements for payment for medical services. As a matter of fact, medical societies throughout the United States have in operation more experiments with new plans for the distribution of medical services than all the proponents of group payment plans have ever proposed.

Prepayment Plans.—The prepayment or group payment medical service plans that have received consideration from medical societies vary extensively in details but can be classified into two main types:

First, medical service plans on a unit service basis whereby an organization is created to collect funds from members and to provide medical services through participating physicians who agree to accept a prorated division of whatever funds are available after expenses have been paid.

Second, medical service plans on a cash indemnity basis, whereby an organization is created to collect funds from members and to pay a designated amount of cash to assist members in meeting their medical bills.

Under the unit service plan a schedule of the number of units to allow for each service is established, and the value of the unit is determined by dividing the amount of money available for medical bills by the number of units of service rendered. Under the cash indemnity plan, benefits are paid according to a listing of benefits which limits the amount that can be paid to the member or on assignment to his physician—the payments do not fix the physician's fees but assist the member to meet his medical bills.

Most of the proposals have contemplated the organization of some unit service plan. The simplicity of this type of arrangement, which entitles members to all necessary medical services with the participating physicians agreeing to divide the funds collected on an equitable basis is most appealing. There has been much experience with this unit system method, most of which would seem to indicate that there are difficulties which must be overcome before satisfactory results can be expected. Probably because of the known difficulties with unit service plans, the House of Delegates, both at the last annual session in San Francisco and at the recent Special Session in Chicago, gave particular encouragement to the development of cash indemnity plans.

A supplementary report, "Organized Payments for Medical Services," which describes practically all the various methods of organizing payments for medical services, contains a detailed discussion of the advantages and disadvantages of cash indemnity and unit service plans. The experience that will be gained under each of these two types of prepayment medical service plans may point the way to future arrangements for medical practice.

GROUP HOSPITALIZATION

Group hospitalization plans have continued to develop rapidly throughout the year 1938. Today there are eighty such plans in operation, with more than two and a half million members enrolled. Proposals for the organization of these plans are also receiving consideration in at least fifty-six communities.

The medical profession has given close attention to the development of group hospitalization plans beginning with the inauguration of the original plan. The first study of these plans was conducted by the Bureau of Medical Economics in 1932, and the criticisms and suggestions outlined in that study and in subsequent studies laid down many of the principles which the actual operation of group hospitalization plans has proved to be of fundamental importance. The consideration that the House of Delegates has given to the progress of group hospitalization plans has been based on sympathetic understanding of the desirability of some method of insurance payment to assist persons to pay hospital bills. At the same time the House of Delegates has evidenced concern over the possible deleterious effect on the practice of medicine in hospitals by an organized method of payment for hospital bills which would result in a lowering of the quality of services rendered to patients or a prostitution of the medical specialties practiced in hospitals.

It is a matter for concern on the part of the medical profession, in connection with these hospital service or group hospital insurance plans, that the inclusion of medical services in the hospital service contracts is being proposed. This feature of group hospitalization contracts has received the serious consideration of the House of Delegates on previous occasions and prompted the preparation of an extensive report, "Group Hospitalization," by the Bureau of Medical Economics, in which the experience of hospital service plans throughout the United States was analyzed. This report pointed out the undesirable effect on medical practice in hospitals when special medical

services such as anesthetic, pathologic and radiologic services are included in a hospital service contract on a service basis.

Policy Established by House of Delegates.—The attitude that has been taken by the House of Delegates toward the inclusion of medical services in group hospitalization contracts can be outlined as follows:

In June 1937 the House of Delegates recommended:

... that the contract benefits provided by group hospitalization insurance should be limited to the room, bed, board and nursing facilities ordinarily provided by hospitals and routine medicines. . . . In regard to certain benefits offered by many hospital insurance plans, combining professional and technical services, the committee is in complete sympathy with those who would make every possible provision to prevent inclusion of any and all types of services involving medical care.

Also in 1937 the House of Delegates adopted the Ten Principles for the guidance of group hospitalization plans which are published on page 247 of the report "Group Hospitalization." The fourth of these Ten Principles states that the provisions in a hospital service contract should be limited exclusively to hospital facilities, which are defined to include "only hospital room accommodations, such as bed, board, operating room, medicines, surgical dressings, and general nursing care."

At the session of the House of Delegates in San Francisco (1938) the fourth of these Ten Principles was extended by the following statement:

If for any reason it is found desirable or necessary to include special medical services such as anesthesia, radiology, pathology or medical services provided by outpatient departments, these services may be included only on the condition that specified cash payments be made by the hospitalization organization directly to subscribers for the cost of such services.

At the Special Session of the House of Delegates in September 1938 approval was given to the principle of hospital service insurance, provided these plans confine themselves to provision of hospital facilities and do not include any type of medical care.

The House of Delegates has declared that most of the difficulties concerning medical services in group hospitalization contracts can be avoided either by omitting all provisions for medical services on a service basis or by providing cash benefits directly to the subscriber for designated medical services. The first of these arrangements has been put into effect in cities such as St. Louis, Washington, D. C., and Wilmington, Del., where the group hospitalization plans exclude practically all such medical services. The second arrangement has been put into effect in Oakland, Calif., in Pittsburgh and Philadelphia, and in other localities, where the hospital service plans include certain medical services but on a basis which permits the payment of cash benefits directly to the patient or the physician. Such group hospitalization plans have the cooperation of the medical societies in these localities.

The recommendations of the House of Delegates have been concurred in by the action of state and county medical societies and by resolutions adopted by national societies of specialists, all of which have pointed out the undesirability of including special medical services in hospital service contracts on a service basis. It can be accepted, therefore, that the conviction of the medical profession generally is that the inclusion of medical services in a group hospitalization contract on a service basis will have an undesirable effect on the practice of medical specialties in hospitals and on the quality of the service rendered.

Hospitalization Contracts Show Variations.—An analysis of the contracts sold by sixty-three of the group hospitalization plans now in operation indicates that twenty-seven do not include x-ray services, thirty-one do not include pathologic services except for limited routine laboratory examination, and twenty-five do not include anesthesia. A comparison of the membership and financial experience of the plans that sell contracts in accordance with the recommendations of the House of Delegates indicates that a hospital service plan can enroll as many members and operate as successfully as the plans which include special medical services.

Whatever may be the attitude of hospital administrators or physicians concerning the arrangements that should exist between hospitals and physicians practicing in hospitals, it seems that this larger problem should not be confused with the principles that have been established concerning the inclusion of medical services in group hospitalization contracts to be sold by

hospital service corporations. These principles specify that special medical services such as anesthetic, pathologic and radiologic services should not be included as benefits in a hospital service contract unless cash payments for these services are made to the subscriber or on assignment to his physician.

A contractual arrangement between the hospital and a hospital service corporation whereby a specified payment is to be made by the corporation to the hospital for each patient day of service, including professional services that are properly performed by physicians, raises many ethical and legal problems. Hospital administrators and physicians are justified in attempting earnestly to prevent the growth of these problems. While a hospital service corporation may contract with hospitals for the use of hospital facilities, it is believed to be undesirable for these corporations to contract with hospitals for the medical services in the hospital.

Practical Application of Principles.—The principles which have been adopted by the House of Delegates of the American Medical Association offer two possible alternatives:

First, that special medical service benefits be entirely omitted by restricting the benefits of the hospital contract exclusively to hospital facilities such as bed and board, use of the operating room, medicines, surgical dressings and general nursing care.

Second, that special medical service benefits may be included in the hospital service contract providing the benefits for such services are payable in cash to the subscriber or on assignment to his physician or hospital.

Both of these alternatives have been put into operation in various localities and either one will permit the organization of a hospital service plan that can have the full support of the medical profession.

At the same time the Committee on Hospital Service and the Council on Hospital Insurance of the American Hospital Association seem to be encouraging the development of plans that include special medical services on a service basis. It appears that the staffs of local hospitals are first induced to support a proposed hospital service plan which includes special medical services on a service basis and afterward an attempt may be made to secure approval of the plan by the local county medical society. The county medical society is then faced with the problem either of disavowing the principles suggested by the American Medical Association and by the state medical society or of disapproving the action taken by members of the hospital staffs. The American Hospital Association at its last annual session approved the extension of hospital care insurance plans to include medical fees in hospital practice when the arrangements are approved by the local county medical society. At a recent conference between representatives of the American Medical Association and the American Hospital Association this problem was frankly discussed.

The recommendation of the House of Delegates with regard to the principle that special medical services on a service basis be entirely excluded from the hospital service contract, or that direct cash benefits be paid for such services, has received official sanction by a considerable number of medical societies. There is need, however, for a more thorough understanding of this recommendation by many physicians, hospital administrators and the public.

This principle takes on added importance in view of the suggestions being made by directors of hospital service corporations that the hospital service contract be extended to include all medical services in the hospital—surgical and general medical services as well as the special medical services of anesthesia, pathology and radiology. The development of medical service plans under the auspices of medical societies or voluntary organizations reemphasizes the necessity for maintaining separate provisions for the physician's services and for hospital facilities.

A joint report of the three national hospital associations has suggested that federal legislation be sought to permit the licensing of hospital service corporations similar to the federal licensing of credit unions. It is contemplated that such federally licensed hospital service corporations would be the proper agencies to enter into contracts with the government for the care of the indigent sick. This proposal also emphasizes the necessity for separate arrangements for the provision of the personal services of physicians.

Apart from the specific principles for group hospitalization plans, the House of Delegates in 1935 adopted the following:

The House of Delegates would again emphasize particularly the necessity for separate provisions for hospital facilities and the physician's services. Payment for medical service, whether by prepayment plans, instalment purchase or so-called voluntary hospital insurance plans, must hold, as absolutely distinct, remuneration for hospital care on the one hand and the individual, personal, scientific ministrations of the physician on the other.

RELATIONS BETWEEN PHYSICIANS AND HOSPITALS

The relations of physicians and hospitals concerning medical services for hospitalized patients have been brought to a sharp focus by the development of group hospitalization plans, all-inclusive rate plans and governmental arrangements for hospital care of the indigent which look to the hospital as the source of medical care and tend to subordinate the physician to a status similar to that of an employee of the hospital.

It is suggested that the House of Delegates and state and county medical societies might properly take cognizance of the fact that certain types of group hospitalization plans and other payment arrangements for hospital care may tend to establish relations between physicians and hospitals that are not desirable for the welfare of hospitalized patients or for the furtherance of good medical practice in hospitals.

At the last annual session the House of Delegates recommended that a joint study be made by the Council on Medical Education and Hospitals and the Bureau of Medical Economics to determine the existing relations between hospitals and the physicians practicing therein. This study was to be undertaken with a view toward a clearer definition of the relationships in the departments of anesthesia, radiology, pathology and physical therapy in order that ethical standards may be established for the practice of medicine by physicians in hospitals which would prevent the exploitation of either the public, the hospitals or the physicians.

The results of this study will be reported by the Council on Medical Education and Hospitals. As a part of the study, the Bureau of Medical Economics has made an analysis of schedules obtained from 876 radiologists by the Inter-Society Committee for Radiology concerning the economics of the practice of radiology.

MEDICAL FEE SCHEDULES

The Bureau of Medical Economics, since it was established in 1931, has made an effort to collect fee schedules from county medical societies. During 1934 the Bureau computed minimum and maximum average fees for the United States for 530 items from 384 county schedules which it had in the files at that time. This list of 530 items with average fees was kept in the files of the Bureau where it could be referred to on questions involving medical fees, but at no time has any fee schedule been recommended for adoption by county medical societies.

In November 1937 a concentrated effort was made to secure a more complete and up-to-date record of county fee schedules. A letter was sent to the secretary of every county medical society in the United States requesting a copy of the fee schedule that had been adopted or was being used by the county society at that time. A complete list of the number of letters sent out and of the number of replies and schedules returned by the county society is given in table 1.

At the annual meeting of the House of Delegates of the American Medical Association in San Francisco in June 1938 the following Resolution on Fee Schedules was adopted:

WHEREAS, State and county medical societies have from time to time, on their own initiative or at the request of others claiming a valid or social interest in the cost of medical services to a particular group, established so-called fee bills on which the contracting persons or groups agree to base charges; and

WHEREAS, Such fee bills often set up without due regard to the equitable interest of the various groups concerned furnish an implement through which exploitation is practiced and abuses encouraged; and

WHEREAS, The necessity for or advisability of such schedules has never been considered by the House; and

WHEREAS, Controversy over the application of such schedules is rife, serving to divert the attention of the contracting persons from the central fact—namely, the quality of medical care—thus reflecting unfavorably on the profession and lending comfort to those critics who charge it with the adoption of trade union methods; and

WHEREAS, It has been the unwritten rule, established by a long line of ethical practitioners, both past and present, to adapt charges for medical services to the ability of his patient to pay; untrammelled by fixed community schedules; therefore be it

Resolved, That this device, appearing with increasing frequency, examined by an appropriate agency of the American Medical Association to the end that the Association may declare itself on certain controversial points, among which are:

(a) The advisability of or necessity for fee schedules in the public interest.

(b) Their ethical or unethical qualities.

(c) Necessity for certain fixed principles to guide constituent units of the Association when and if it is deemed, in the public interest, necessary to adopt such a device, and

(d) Whether such schedules, approved by constituent units of Association, should or should not provide for elasticity so as to permit of adaptation to wage levels, specialized medical services, variations based on differential costs as between urban, semiurban and rural practice and other related considerations.

In June 1938 the Bureau began compiling and tabulating figures recorded on the county medical societies' fee schedule. At first it was necessary to make a composite list of all included in the 558 county fee schedules. The nomenclature of classifications in the schedules varied greatly. No two schedules were completely alike. Considerable time and work were involved in making a complete list that would include the services on which three or more counties reported fees. Many of the counties reported a very short schedule—a list of the most common services performed by the general practitioner in his daily practice. Others had a very elaborate and detailed list of more than 300 items including many unusual and seldom

TABLE 1.—Number of Requests for County Fee Schedules and the Number of Replies

State	Number of Requests Sent to County Medical Societies	Number of Schedules Returned	Replied But No Schedule Submitted	No Reply
Alabama.....	67	12	14	40
Arizona.....	13	2	2	9
Arkansas.....	62	15	5	42
California.....	39	9	10	20
Colorado.....	28	0	3	19
Connecticut.....	8	..	5	3
Delaware.....	5	..	2	1
District of Columbia..	1	..	..	1
Florida.....	33	10	5	15
Georgia.....	91	13	2	70
Idaho.....	9	3	..	6
Illinois.....	93	35	9	49
Indiana.....	83	21	5	67
Iowa.....	97	23	0	74
Kansas.....	67	20	4	41
Kentucky.....	114	19	3	92
Louisiana.....	40	5	5	20
Maine.....	15	1	4	10
Maryland.....	22	4	2	16
Massachusetts.....	18	4	3	11
Michigan.....	54	18	8	25
Minnesota.....	34	12	3	19
Mississippi.....	21	2	3	16
Missouri.....	80	18	9	51
Montana.....	15	6	1	8
Nebraska.....	50	12	8	29
Nevada.....	5	1	..	4
New Hampshire.....	10	1	1	8
New Jersey.....	21	6	6	9
New Mexico.....	14	4	8	2
New York.....	61	26	8	27
North Carolina.....	73	29	3	41
North Dakota.....	13	3	1	9
Ohio.....	87	19	15	53
Oklahoma.....	65	16	4	45
Oregon.....	23	8	16	4
Pennsylvania.....	60	14	4	42
Rhode Island.....	6	1	2	3
South Carolina.....	37	5	1	31
South Dakota.....	22	3	..	19
Tennessee.....	59	11	7	41
Texas.....	131	33	10	88
Utah.....	9	4	1	4
Vermont.....	10	1	1	8
Virginia.....	48	19	4	25
Washington.....	24	6	3	15
West Virginia.....	30	5	6	19
Wisconsin.....	52	19	10	23
Wyoming.....	11	4	3	4
Total for United States	2,021	559	238	1,224
	100%	28%	11%	61%

used tests and operations. In the final list, which includes a total of 606 items, the medical and surgical services are subdivided under ten main headings and twenty-three subheadings. All of the fees have now been transferred from the county schedules to this uniform list of items and the number of fees reported for each item has been computed.

Table 2 gives a list of the medical and surgical services on which the greatest number of societies reported a fee. This list indicates the type of services on which the majority of the

county medical societies considered established fees to be practicable. Except for surgical procedures, complement fixation tests for syphilis and postmortem examinations, the list includes only services which the general practitioner might be expected to perform every day under ordinary conditions. The fact that so many county medical societies' schedules do not include

TABLE 2.—Common Services for Which More Than 100 Counties Reported Fees

Classifications	Number of Counties Reporting These Fees
Home visit.....	536
Office visit.....	514
Obstetrics—normal delivery.....	436
Night visit.....	412
Mileage.....	400
Consultation.....	279
General anesthetic.....	278
Veneral disease treatments.....	235
Fractures.....	228
Urine tests.....	217
Herniotomy.....	208
Smallpox immunization.....	205
Amputations.....	205
Circumcision.....	201
Gynecologic operations.....	182
Appendectomy.....	172
Physical examinations.....	168
Prescriptions.....	167
Tonsillectomy.....	153
Hypodermic medication.....	126
Physical examinations for insurance.....	119
Intravenous medication.....	117
Complement fixation test for syphilis.....	107
Surgical assistant's fee.....	105
Postmortem examinations.....	100

established fees for the remaining 581 items, which make up the composite list, indicates the difficulty of establishing fees for services for which the amount of time, skill and responsibility required cannot be determined in advance.

Study of Medical Fees to Continue.—The next phase of study, now in progress, is to compile average minimum and maximum fees for each state for every item on which a sufficient number of fees from which to compute an average are reported. Average minimum and maximum fees for the United States will be computed for all the 606 items. These average fees will be used as a basis for a further study on the question of the necessity or desirability of established fee schedules for medical and surgical services. There are many other factors which must be considered in presenting the arguments for and against this question, but to enter into a discussion of fee schedules it is necessary to know the existing average fees in the various states and the geographic and political divisions of the United States. An equitable fee depends not only on the professional skill required and the time consumed but also on costs of living and the economic status of the majority of the people in a given locality. Medical fees also show considerable variation in rural areas as compared to industrial centers. Consequently, average fees for the entire United States would be useful to any particular county society only as a comparison of the difference between the local medical fees and the average fees for the United States. Average fees for a state might be a more practical guide for a county medical society within the particular state if the average fees were derived from figures that are representative of the actual amounts usually charged for medical services in that state.

These average figures will also be useful as a guide in determining equitable fees for medical services under various medical care plans for special economic groups such as the indigent, Farm Security Administration clients and the low income group. At the present time requests have come from more than twenty-five county medical societies that do not have fee schedules or wish to revise their fee schedules for a schedule of average fees which could be used as a guide in setting up or revising a fee schedule.

The completed study of fee schedules, so far as information is available, will be submitted as a supplementary report of this Bureau.

COLLECTING MEDICAL FEES

The Bureau of Medical Economics continues to receive complaints from physicians concerning the practices of commercial collection agencies in the collection of medical accounts. A report "Collecting Medical Fees" which was published serially

in *THE JOURNAL* beginning in May 1938 outlined and discussed the various systems used by commercial collection agencies with particular emphasis on practices that tend to defraud the unwary physician and often deal harshly with his patients. A special study of professional credit and collection bureaus was also included in this report.

During the past year 460 copies of the report "Collecting Medical Fees" were distributed to medical societies, physicians, collection agencies, libraries and lay individuals. Including a previous report on collecting medical fees, a total of 6,200 reports have been distributed within the past six years to assist physicians with their collection problems.

One of the most significant developments in medical economics during recent years has been the organization of credit and collection bureaus by county medical societies or by groups of physicians. This movement toward professional control of agencies for the collection of medical accounts has progressed rapidly during the past five years and symbolizes the effort on the part of physicians to eliminate many of the undesirable features that have arisen because of dissatisfaction with methods used by commercial collection agencies and because of the need for an agency to organize some of the "business" aspects of medical practice.

According to available records there are at least fifty professionally controlled credit and collection bureaus in operation, and twenty-five others are proposed. Reported experiences with the operation of these bureaus indicates that they perform a valuable service for the patients and the physicians in the communities where they were organized.

Inappropriate Collection Methods.—Improper or unsatisfactory collection arrangements are prominent among the reasons which cause medical accounts to have the highest ratio of bad debts of all retail accounts in the United States. The consequent loss of payments amounts to an estimated one-fourth billion dollars annually. An even greater damage to the physician's practice is caused by improper credit and collection practices that lead to dissatisfaction with the use of the sliding scale of fees and sometimes may encourage malpractice suits. Greater attention to the "business" side of medical practice with special regard for extension of credit to patients and billing procedures is not unprofessional or beneath the dignity of the medical profession, particularly when it can be shown that lack of attention to the proper conduct of the business side of medicine results in extensive harm to the delivery of good medical service by threatening to destroy the personal and friendly relations between physicians and their patients.

Familiarity with Collection Methods Essential.—Once again physicians should be urged to familiarize themselves with the proper procedures to follow in the use of a third party agency to collect medical accounts. While complaints continue to be received, there has been an encouraging decrease in the number of complaints from physicians who have been defrauded by unscrupulous collection agencies and methods. Recently the postal authorities convicted the officers of a large collection agency of fraud and it appears that other collection agencies utilizing similar contracts will no longer be allowed to use the mails to transact their business. Legislation in certain states for the licensing of collection agencies is contemplated in the hope of providing at least some regulation of these agencies. The most hopeful possibility, however, is that the individual physician will learn to avoid collection agencies that use methods which almost invariably lead to unfair dealings with his patients and sly handling of his accounts.

SICKNESS FINANCING COMPANIES

The formation of special financing organizations which offer to make available funds with which to finance medical accounts is creating an important financial institution which may introduce new problems in the medical field. In the past, medical societies and physicians have not been in favor of finance plans on the ground that such arrangements do not lower the cost of medical care but instead result in an additional cost to the patient and in many of the arrangements increase costs for the physicians. It has been felt that persons with low incomes whose medical accounts require special arrangements are deserving of a reduction rather than an increase in charges by the addition of interest or other expenses paid to a financing agency.

It is true that patients now have access to a variety of lending agencies such as personal finance companies, Morris Plan and industrial banks, personal loan departments of banks, credit unions, remedial loan societies, pawnbrokers and unlicensed lenders of all types. For example, it was estimated that in 1936 more than \$40,000,000 was lent by personal finance companies alone to patients for medical, dental and hospital bills.

The feasibility of developing special finance plans, perhaps under the auspices of medical societies or groups of physicians, will undoubtedly be given wide consideration. Already several medical societies have experimented with a special financing arrangement. The Bureau of Medical Economics has records of forty-five sickness financing plans the majority of which are still privately financed and owned institutions. A thorough study of sickness financing arrangements would seem to be warranted, especially in view of the likelihood of a development of financing arrangements under sponsorship of medical societies.

MALPRACTICE INSURANCE

Within the past few years, considerable changes in policies and rates for malpractice insurance have been made by practically all companies writing this type of insurance. Increasing underwriting losses have caused insurance companies to become concerned over the selection of "malpractice risks." The present unsettled situation in the underwriting of malpractice insurance is due to many possible causes, among which are the increasing complexity of medical practice involving more general use of special apparatus such as x-ray and physical therapy, a resentment on the part of certain patients of efforts of physicians to collect payments for delinquent accounts, critical comments by some physicians and the general attempts which have recently been made to discredit the medical profession. These and other factors have led to an increasing tendency for patients to allege that their physicians are guilty of malpractice.

A question has been raised as to whether there is any relationship between the American Medical Association and insurance companies writing malpractice insurance, apparently because several companies require that an applicant be a member of a medical society. These insurance companies establish their own policies, which, presumably, change with experience. The American Medical Association has not attempted to influence insurance companies in the formulation of their policies pertaining to rates, coverage, type of risks accepted, or any other part of the companies' business.

The Bureau of Medical Economics has made an effort to secure from the companies a statement of their policies in order that intelligent replies might be made to correspondents who inquire about malpractice coverage.

PUBLICATIONS

In addition to the reports already mentioned, two new studies have been published, "Medical Relations Under Workmen's Compensation—Developments since 1930" and "Health Insurance in England," which bring down to date the information in these two important fields of medical economics. The report "Sickness Insurance Not the Remedy" has been rewritten with much additional information, and the report on "Contract Practice" has been revised with new material added that involved a study of nearly a thousand of such plans for which records exist in the Bureau. Other publications that were reprinted during the year were "Critical Analysis of Sickness Insurance," "The Economics and Ethics of Medicine" and "Sickness Insurance Catechism."

Developments and extensions in the medical program of the Farm Security Administration have required examination and analysis of the different arrangements made by the Farm Security Administration with state and county medical societies. Many medical societies, before entering into such agreements, have asked for information, suggestions and copies of the plans used in other states. A full report of the Farm Security Administration plans is included as a chapter in the report "Organized Payment for Medical Services." Likewise medical societies have requested detailed information concerning plans for the care of the indigent. A chapter describing the arrangements for the care of the indigent throughout the United States is also embodied in the report "Organized Payments for Medical Ser-

vices." A chapter in this report also outlines the developments under the Social Security Act which are of interest to medical societies.

Medical economics abstracts were prepared each week for the Organization Section of THE JOURNAL. In many cases these abstracts require considerable research and statistical work or translation from European publications. Articles on socialized medicine and other subjects in medical economics were also prepared for several nonmedical magazines.

NATIONAL HEALTH PROGRAM

The factual data on which the National Health Program was based were taken largely from the information collected in the National Health Survey. As soon as the reports of the National Health Survey became available, the Bureau prepared analyses of certain parts on which comments could be made without consulting all the basic data.

Likewise, as soon as the text of the National Health Program was issued, an analysis was made for the Board of Trustees and for use of the reference committees of the Special Session of the House of Delegates in September 1938.

These analyses and additional statements bearing on particular portions of the National Health Program were made available to the committee of the House of Delegates which met with government representatives in October and December 1938 to discuss the recommendations of the National Health Program.

DEPARTMENT OF JUSTICE INVESTIGATION

When the Department of Justice investigator visited the Bureau, every assistance was given him to examine all the source files and correspondence bearing on the mission for which he was sent. This assistance went further than the mere compliance with requests to see specific material. Suggestions were made concerning other material which it was thought might be of interest or assistance. All reprints and publications of the Bureau were given to the investigator and he was invited to return at any time, when every possible assistance to examine every document in the Bureau files would be given him. The contact with the investigator was very cordial.

Later, when the subpoenas were received for specific material, much time was required to collect from the Bureau files all the material needed to comply with the subpoenas. Photostatic copies of the original material sent to the Department of Justice, Washington, D. C., are on file in the Bureau.

OTHER ACTIVITIES

One important portion of the work of the Bureau is the furnishing of information on medical economics subjects which comprise fifty-five main subject classifications with 159 sub-classifications. Requests for information on these topics come to the Bureau by letter, telephone, telegram or personal visits from physicians, both as individuals and as officers of medical organizations, from individual lay persons and from administrators of various agencies.

The majority of the written requests have to be answered on an individual basis, which requires considerable research and library work to secure the specific information requested. This is particularly true of requests received from secretaries of committees appointed by medical societies to conduct special studies in various problems of medical economics. Requests are chiefly for information concerning group hospitalization, medical care, plans, state medicine, contract practice plans, collection agencies, insurance companies (particularly malpractice insurance), costs of medical care and medical education, income from medical practice, distribution of physicians and hospitals, rural medical services, care of the indigent sick, and medical relations under workmen's compensation.

Representatives from a variety of organizations, but chiefly from state and county medical societies, often visit the Bureau in person for consultation on particular medical economic problems. These consultations have served a distinctly useful purpose in acquainting representatives of the county medical societies with the functions of the Bureau and in making known to representatives of lay organizations that the source files of the Bureau contain much information concerning the medical economic problems in which they are interested, as well as to acquaint the Bureau with the nature of their problems. In a

number of instances the visits from interested persons have developed into valuable contacts with important organizations in other fields, such as public welfare, insurance, foundations, government agencies, workmen's compensation commissions and industry.

On many occasions the Director or his associates are invited to address or confer with state or county medical societies, national organizations such as the American Association of Medical Students, American Hospital Association, American Pharmaceutical Association, American Public Welfare Association, National Association of Retail Druggists, National Conference of Social Workers, National Education Association, United States Children's Bureau, United States Public Health Service, Conference on Rural Medical Care, State and Provincial Health Authorities of North America and local groups such as women's auxiliaries, state hospital associations, women's clubs, public forums, high school clubs, colleges and universities, Y. M. C. A., Rotary, Kiwanis, and Lions clubs, and consumer groups. Engagements with these medical societies and national or local organizations have averaged one a week during the year.

Summary

Study of Medical Care.—Medical societies in forty-five states and the District of Columbia are participating in the Study of Medical Care. Already 416 county medical societies in thirty-six states with the cooperation of other agencies and organizations interested in medical services have completed a study of the need and supply of medical care in their communities.

A special study of free medical services rendered by physicians and dentists throughout the United States has been made by having records of free medical services kept for three representative periods of seven days each.

A supplementary report will summarize the results of the Study of Medical Care and the special study of free medical services.

Medical Service Plans.—Medical societies throughout the country have taken a very active part in the study and development of medical service plans. A supplementary report, "Organized Payments for Medical Services," has been prepared which describes practically all the various methods of organizing payments for medical services.

The prepayment or group payment medical service plans which have received consideration from medical societies can be classified into two main types: (1) unit service plans, which provide medical services through participating physicians who agree to accept a prorated division of whatever funds are available after administrative and other expenses are paid; (2) cash indemnity plans, which provide a designated amount of cash to assist members in meeting their medical bills. Experience gained under each of these types of medical service plans will, no doubt, produce much helpful information.

Group Hospitalization.—Hospital insurance plans organized by hospital administrators and physicians have continued to receive widespread attention. One major problem in connection with these plans is concerned with the question of including or excluding special medical services, such as anesthesia, pathology and radiology. The experience gained in the operation of these plans emphasized the importance of the recommendations of the House of Delegates that such special medical services be omitted from a hospital service contract or included only on the basis that cash benefits be payable directly to the member.

The development of medical service plans raises a further question as to the relation between hospital service plans and other medical services in the hospital—surgical and general medical services. The consensus seems to be that a medical service plan should be kept separate in its organization and administration from a hospital service plan.

Relations Between Physicians and Hospitals.—Various organized arrangements for the payment of medical services in hospitals brought into sharp focus the neces-

sity for establishing a clearer understanding of relationships between the hospital departments of anesthesia, radiology, pathology and physical therapy and physicians practicing in these departments.

Medical Fee Schedules.—An exhaustive survey of county medical society fee schedules has been completed. All the county fee schedules that could be obtained were classified and tabulated into a composite fee table, which includes a total of 606 items and the "average" minimum and maximum fees for each item.

A supplementary report, "Medical Fee Schedules," has been completed in accordance with the request of the House of Delegates that a study be made of the advisability and necessity of fee schedules.

Collecting Medical Fees.—A significant development in medical economics during recent years has been the organization of credit and collection bureaus by county medical societies or by groups of physicians. The movement toward professional control of agencies for the collection of medical accounts has been reported in a special study, "Collecting Medical Fees." This report also outlines and discusses the various systems used by commercial collection agencies and gives particular emphasis to the practices that tend to defraud the unwary physician. Physicians are urged to familiarize themselves with the preferable procedure to follow in the use of a third party agency to collect medical accounts.

Sickness Finance Companies.—Recently interest has been evinced in the development of special medical finance plans under the auspices of medical societies or groups of physicians. Patients now have access to a variety of lending agencies and careful study should be given to the development of financing arrangements under the sponsorship of medical societies.

Malpractice Insurance.—Policy provisions and rates for malpractice insurance have been subjected to considerable changes in the past few years. Increasing underwriting losses have caused insurance companies to become concerned over the selection of malpractice risks. The present unsettled situation in the underwriting of malpractice insurance is due to many causes, not the least of which has been the recent attempts to discredit the medical profession.

Publications.—In addition to the reports already mentioned, two new studies, "Medical Relations Under Workmen's Compensation—Developments since 1930" and "Health Insurance in England," were published. Two new reports, "Sickness Insurance Not the Remedy" and "Contract Practice," have been submitted for publication.

The new report "Organized Payments for Medical Services" will also contain chapters descriptive of Farm Security Administration plans, arrangements for the care of the indigent sick and medical care developments under the Social Security Act.

Articles and abstracts pertaining to medical economic problems were prepared for the Organization Section of The Journal and for some nonmedical magazines.

National Health Program.—Analysis and statements pertaining to the National Health Program and the National Health Survey were prepared for the Board of Trustees and the committee appointed by the House of Delegates to confer and consult with proper federal representatives.

Department of Justice Investigation.—Every possible assistance was given to the investigator from the Department of Justice to examine all the source files and correspondence of the Bureau which might have a bearing on the mission for which he was sent.

Other Activities.—Correspondence, consultations and speaking engagements increased continuously throughout the year but have made possible a wide distribution of information concerning medical economic problems.

Bureau of Investigation

Dr. Paul C. Barton, formerly a member of the administrative personnel of the Council on Pharmacy and Chemistry, assumed the duties of Director of the Bureau of Investigation Nov. 1, 1938.

The services of this Bureau continue to be utilized by physicians and laymen, and many inquiries are received from representatives of organizations that are concerned with the detection and exposure of fraud for the purpose of public protection, as well as from official agencies that are concerned not only with the detection and exposure of fraud but also with the prosecution of impostors. Approximately 10,000 direct inquiries were received by the Bureau in 1938, about 60 per cent of which came from the lay public and about 40 per cent from physicians. It seems to be evident that the Bureau is filling a real need in supplying information, since many inquirers, including busy physicians, take time to write letters of acknowledgment and thanks for the information furnished in response to their inquiries. An increasing number of communications requesting information are received from students and from the members of consumers' study groups. In most instances the material provided by the Bureau for students and for the members of study groups is utilized in the preparation of essays presented before classes, and thus wide distribution is given to the information that is made available through this Bureau.

Many requests for information are received from newspapers, magazines, broadcasting stations and advertising agencies concerning the acceptability of products for which advertising is offered. Most of these requests come from publications, radio station operators and advertising agencies in the Eastern part of the United States and in the Middle West.

The services of the Bureau of Investigation continue to be used by various agencies of the federal government and the utmost possible cooperation is maintained between the Bureau and the Food and Drug Administration, the Federal Trade Commission and the Post Office Department. These governmental agencies provide the Bureau with official releases based on fraud orders, notices of judgment and other orders, and much of the information so secured is published in *THE JOURNAL*. Cordial cooperative effort is maintained with Better Business Bureaus throughout the United States.

The Bureau has continued the long-established policy of providing physicians, teachers, health officers and civic groups with material to be used for exhibit purposes and for the preparation of public addresses. The amount of such material distributed during the year was approximately the same as in each of several preceding years.

Articles of current interest were prepared by the Bureau for publication in the Association's periodicals during the year, many of which were contributed by Dr. Arthur J. Cramp, who was for many years Director of the Bureau of Investigation.

Bureau of Exhibits

THE SCIENTIFIC EXHIBIT

There were 242 signed applications for space in the Scientific Exhibit at the San Francisco session, of which 161 were accepted, 66 per cent. The Scientific Exhibit occupied a floor area of 27,665 square feet, located in various halls, rooms and corridors of two floors. Because of the somewhat limited space available there was much congestion.

Total Exhibits, 1938.—In addition to 161 exhibits for which there were signed applications, there were two special exhibits on fractures and on anesthesia, and four motion picture booths sponsored by the various sections of the Scientific Assembly. There were 136 exhibits sponsored by the sections, forty-nine of which were accompanied by papers read before the various sections during the week.

Section exhibits	136
Educational group	
National organizations	16
Organized medicine	9
Motion picture booths	4
Special (subsidized) exhibits	2
	167

Exhibits and Registration.—For each exhibit in the Scientific Exhibit, thirty-six Fellows of the Association registered at the

General Registration Booth. This was a slightly smaller ratio than last year, as shown in the table below, in spite of the fact that a larger percentage of applications were rejected this year than in former years. The lower figure this year, therefore, is without much significance.

	Total Exhibits	Total Registration	Attendance per Exhibit
Cleveland, 1934	167	6,293	37.7
Atlantic City, 1935	213	8,166	38.3
Kansas City, 1936	176	6,824	38.7
Atlantic City, 1937	254	9,764	38.4
San Francisco, 1938	167	6,034	36.0

Section Exhibits.—The fifteen sections of the Scientific Assembly presented 136 exhibits, an average of nine each, as compared with thirteen each last year. The largest number of exhibits presented by any section were in the Section on Pathology and Physiology with seventeen exhibits and the smallest number the Section on Laryngology, Otology and Rhinology with four exhibits. Following is a comparison of exhibits presented by the various sections for the past several years:

	Kansas City 1936	Atlantic City 1937	San Francisco 1938
Practice of Medicine	21	18	11
Surgery	17	26	16
Obstetrics and Gynecology	6	10	6
Ophthalmology	11	11	8
Laryngology, Otology and Rhinology	5	9	4
Pediatrics	11	9	6
Pharmacology and Therapeutics	7	9	9
Pathology and Physiology	11	17	17
Nervous and Mental Diseases	5	8	7
Dermatology and Syphilology	7	12	11
Preventive Medicine	6	14	5
Urology	7	8	6
Orthopedic Surgery	11	11	16
Gastro-Enterology	12	18	8
Radiology	10	14	6

The Section on Practice of Medicine was represented by Dr. Fred M. Smith, Iowa City, who was also secretary of the section. There were twenty-five applications presented, eleven of which were accepted and one transferred to another section. One exhibit received a Bronze Medal and one a Special Citation. Three of the exhibits were accompanied by papers read before the section.

The Section on Surgery, General and Abdominal, was represented in the Scientific Exhibit by Dr. Grover C. Penberthy, Detroit. There were thirty-two applications, of which sixteen were accepted. In addition to the exhibits, the section presented a motion picture program in an area adjoining the exhibits. Three exhibits received Certificates of Merit and two Honorable Mention. Five of the exhibits were accompanied by papers read before the section.

The Section on Obstetrics and Gynecology was represented by Dr. H. Close Hesseltine, Chicago. There were twelve applications, of which five were accepted and one was transferred from another section. In addition to the exhibits there was a motion picture program presented as a special feature in an area adjoining the exhibit space. One exhibit received Honorable Mention. Two exhibits were accompanied by papers read before the section.

The Section on Ophthalmology was represented by a committee composed of Dr. Georgiana Dvorak Theobald, Oak Park, Ill., chairman, Dr. Dohrmann K. Pischel, San Francisco, and Dr. Derrick Vail, Cincinnati. There were fourteen applications for space, of which eight were accepted. There were no awards made in this section. Five of the exhibits were accompanied by papers read before the section. A very successful motion picture program was run adjacent to the exhibits.

The Section on Laryngology, Otology and Rhinology was represented by Dr. Robert C. Martin, San Francisco. There were seven applications for space, three of which were transferred to other sections, leaving four exhibits to be accepted. One exhibit received an Honorable Mention. Two of the exhibits were accompanied by papers read before the section.

The Section on Pediatrics was represented by Dr. F. Thomas Mitchell, Memphis, Tenn. There were eight applications for space, of which six were accepted. There were no awards made in this section. One exhibit was accompanied by a paper read before the section.

The Section on Pharmacology and Therapeutics was represented by Dr. Wallace M. Yater, Washington, D. C. There were thirteen applications for space, of which nine were accepted. One exhibit received a Gold Medal and one a Certificate of Merit. Four exhibits were accompanied by papers read before the section.

The Section on Pathology and Physiology was represented by Dr. F. W. Konzelmann, Philadelphia. There were twenty-one applications for space, of which sixteen were accepted and one was transferred from another section. Two of the exhibits in this section were awarded medals. Three of the exhibits were accompanied by papers read before the section.

The Section on Nervous and Mental Diseases was represented by Dr. Roland P. Mackay, Chicago. In addition to the exhibits, a motion picture program was presented in an adjoining area. There were twelve applications for space, of which seven were accepted. None of the exhibits received awards. One exhibit was accompanied by a paper read before the section.

The Section on Dermatology and Syphilology was represented by Dr. Clark W. Finnerud, Chicago. There were eighteen applications for space, of which eleven were accepted. The section presented a Symposium on Industrial Dermatoses, which received a Special Citation. There were seven papers presented before the section by exhibitors.

The Section on Preventive and Industrial Medicine and Public Health was represented by Dr. Paul A. Davis, Akron, Ohio. The section had twelve applications for space, of which five were accepted. One of the exhibits received a Silver Medal and one exhibit was accompanied by a paper read before the section.

The Section on Urology was represented by Dr. R. S. Ferguson, New York. There were nine applications for space, of which six were accepted. One exhibit received a Certificate of Merit.

The Section on Orthopedic Surgery was represented by Dr. Norman T. Kirk, San Francisco. The section presented twenty-two applications for space, of which sixteen were accepted. The Committee on Awards presented to exhibits in this section one Silver Medal, two Certificates of Merit and one Honorable Mention. Four of the exhibits were accompanied by papers read before the section.

The Section on Gastro-Enterology and Proctology was represented by Dr. J. A. Bargen, Rochester, Minn. The section had fourteen applications for space, of which eight were accepted. One exhibit received a Certificate of Merit. Four exhibits were accompanied by papers read before the section.

The Section on Radiology was represented by Dr. E. E. Downs, Woodbury, N. J. There were eleven applications of which six were accepted. None of the exhibits received awards, but all six exhibits were accompanied by papers read before the section.

Motion Pictures.—Four sections presented motion picture programs in connection with the exhibits—the Section on Surgery, General and Abdominal, the Section on Obstetrics and Gynecology, the Section on Ophthalmology and the Section on Nervous and Mental Diseases. All the pictures shown were selected with considerable care by the section representatives, the pictures being previewed in some instances. Projectors and operators were furnished by the Association and the programs carried out under the control of the director of the Scientific Exhibit. For the most part the space available for these motion picture programs was too small and crowded, resulting in much congestion. All the pictures attracted large audiences.

Many motion pictures were shown in individual booths by the various exhibitors, who had included part of their evidence in the form of motion pictures. These pictures formed a serious problem in the narrow corridors where the Scientific Exhibit was located.

Special Exhibits.—The Special Exhibit on Fractures was carried on under the official direction of the committee composed of Dr. Kellogg Speed, Chicago, chairman, Dr. Frank D. Dickson, Kansas City, Mo., and Dr. Walter Estell Lee, Philadelphia. More than fifty physicians from various parts of the country assisted with the demonstrations, and a pamphlet describing the exhibit was distributed. Acknowledgment is made to Major General C. R. Reynolds, the Surgeon General, United States

Army, Washington, D. C.; Colonel Roger Brooke, M.C., United States Army, Letterman General Hospital, San Francisco; Lieut. Colonel Norman T. Kirk, M.C., United States Army, Letterman General Hospital, San Francisco; Dr. C. H. Chandler, dean of Stanford University School of Medicine, San Francisco, and Mrs. Mitchell and Mrs. McMurray, nurses from the Stanford University Hospital, San Francisco, for the efficient service which they rendered in connection with the fracture exhibit. Appreciation is also expressed to Dr. Carleton Mathewson Jr., local representative in San Francisco for the fracture exhibit, for his excellent cooperation.

The Special Exhibit on Anesthesia was presented for the second time under the auspices of a committee composed of Dr. Ralph M. Waters, Madison, Wis., chairman; Dr. P. J. Hanzlik, San Francisco; Dr. Chauncey D. Leake, San Francisco, and Dr. Philip D. Woodbridge, Boston, assisted by a competent corps of demonstrators. There was a material increase in the exhibit this year over last year. A pamphlet describing the exhibit was distributed during the meeting, for which there has been a persistent call during the ensuing months. The pamphlet has been reprinted and is now available.

Committee on Awards.—The Committee on Awards was composed of Dr. Eben J. Carey, Milwaukee, chairman; Dr. H. C. Bumpus Jr., Pasadena, Calif.; Dr. Dean Lewis, Baltimore; Dr. E. E. Irons, Chicago, and Dr. W. Walter Wasson, Denver. The duties performed by this committee are of a most arduous nature, involving careful study of each separate exhibit and conscientious and qualified judgment of the merits and value of each.

ASSOCIATION EXHIBITS

The demand for exhibits for loan purposes from the headquarters of the Association has increased again this year. At the present time there are forty-two exhibits pertaining to the various departments of the Association or to subjects in which those departments are interested. During the year, exhibit material was sent out on 124 occasions to forty states. Very often two or more exhibits went to one place, greatly increasing the number of items lent.

There were no international expositions or world's fairs during the year in which the Association participated.

MOTION PICTURES

The demand for motion pictures has continued to increase and the Bureau now has seventeen pictures—fourteen for the medical profession and three for the public. There has been no attempt to build up a large film library but rather to supply information concerning films that may be available elsewhere.

Summary

The Scientific Exhibit at the San Francisco session was marked by very large attendance which constantly filled the halls and corridors on both floors of the exhibit. There were 242 applications for space, of which 161 were accepted. The special exhibits on fractures and anesthesia were outstanding successes.

Association exhibits, dealing with the activities of the Association, were sent out on 124 occasions to forty states.

The demand for motion pictures continues to increase. There has been no attempt to build up a large film library; there are seventeen subjects, however, on the film list, which are almost constantly on loan.

Use of Barbituric Acid and Derivative Drugs

At the annual session of the Association held in Atlantic City in 1937 a resolution pertaining to the sale and promiscuous use of barbituric acid derivatives was submitted to the House of Delegates by Dr. H. A. Lucc, Michigan.

Information concerning existing legislation for the control of the sale of these products was compiled by the Bureau of Legal Medicine and Legislation. Laws designed to establish control over the sale of barbituric acid and derivative drugs have recently been enacted in Georgia, Tennessee and Washington, and a bill of similar nature has been passed by both houses of

the legislature in Delaware but at the time of the preparation of this report has not been signed by the governor. Bills on the same subject are pending in the legislatures of California, Kansas, Minnesota and New York, but none had been enacted into law at the time this report was prepared. A similar bill failed of enactment in Indiana. Up to this time laws providing for the regulation of the sale and distribution of barbituric acid and its compounds and derivatives have been enacted and are now in effect in nineteen states. In one state a law for the control of the sale of barbiturates was enacted several years ago but was later repealed.

While the Council on Pharmacy and Chemistry had already given attention to this matter, the Board of Trustees requested that body to prepare a scientific statement for publication in *THE JOURNAL*, and the Council has prepared an exhaustive report.

Committee on American Health Resorts

Pursuant to resolutions adopted by the House of Delegates at the San Francisco Session, the Board of Trustees has appointed the following Committee on American Health Resorts:

Dr. Bernard Fantus, Chairman, Chicago.
Dr. Walter S. McClellan, Saratoga Springs, N. Y.
Dr. Euclid M. Smith, Hot Springs National Park, Ark.
Dr. M. B. Jarman, Hot Springs, Va.
Dr. William P. Holbrook, Tucson, Ariz.

This committee is now engaged in outlining its plans of work and will no doubt submit a report to the Board of Trustees which can be transmitted to the House of Delegates at its next meeting.

Committee on Distinguished Service Award

After the election of Dr. H. H. Shoulders as Speaker of the House of Delegates, it seemed desirable to have some one designated to serve in his place as Chairman of the Committee on Distinguished Service Award, and the Board of Trustees selected Dr. E. L. Henderson of Louisville, Ky., a member of this House of Delegates, to serve in that capacity. The other members of the Committee on Distinguished Service Award are Dr. John W. Amesse, Denver; Dr. Grant C. Madill, Ogdensburg, N. Y.; Dr. J. D. Brook, Grandville, Mich., and Dr. John F. Hassig, Kansas City, Kan.

The Indictment of the Association

An indictment of the American Medical Association, the Medical Society of the District of Columbia, the Harris County Medical Society, which is a component society of the State Medical Association of Texas, certain members of the Medical Society of the District of Columbia, and certain members of the administrative personnel of the American Medical Association was returned by an additional Grand Jury impaneled at the request of the Department of Justice of the United States. This indictment was reproduced in full in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, Dec. 31, 1938.

Only one member of the official personnel of the American Medical Association appeared before the Grand Jury, and that one appeared only for the purpose of producing material taken from the files of the Association in compliance with the terms of subpoenas issued at the instance of the Department of Justice. It required the expenditure of a great deal of time and effort on the part of a rather large number of members of the working personnel in the Association's offices to comply with the demands presented through these subpoenas, but a sincere and exhaustive effort was made to make the fullest possible compliance.

The Board of Trustees, in accordance with instructions received from the House of Delegates at its special session held in Chicago Sept. 16 and 17, 1938, has engaged counsel and will exert all possible effort to make proper defense before the courts in which the issues involved may be heard.

Ruling of Bureau of Internal Revenue

The House of Delegates was informed at a previous annual session that the Bureau of Internal Revenue of the federal government had issued a ruling to the effect that the American Medical Association is liable for the payment of taxes under the provisions of certain sections of the revenue laws, and that

under this ruling the Association would be classified by the Bureau as a business league rather than as a scientific and educational organization, under which classification the Association had always been placed prior to the issuance of the latest ruling of the Bureau of Internal Revenue.

On authorization of the House of Delegates, the Board of Trustees has appealed for a reversal of this ruling, and its appeal has been pending before the proper officials of the Bureau of Internal Revenue for several months, though at the time of the preparation of this report no decision has been handed down. In the meantime, taxes due under the ruling of the bureau have been paid after careful efforts to estimate fully the amounts due.

Several conferences, participated in by the Association's attorneys and attorneys of the Bureau of Internal Revenue, have been held and at one conference three members of the official personnel of the Association were present and received most courteous consideration at the hands of the government officials present. It is expected that a decision in this matter will be made within the near future.

Miscellaneous Matters

A great many matters that are not covered in this report have received official consideration by the Executive Committee of the Board of Trustees at its monthly meetings and by the Board of Trustees at the regular meetings of this body. To discuss all such matters fully would require the presentation of a report of such length as to make it burdensome. However, the Board of Trustees is prepared to submit to the House of Delegates any information that may be desired and that is available to the Board.

Respectfully submitted.

ARTHUR W. BOOTH, Chairman.
AUSTIN A. HAYDEN, Secretary
ROGER I. LEE.
ALLEN H. BUNCE.
RALPH A. FENTON.
JAMES R. BLOSS.
THOMAS S. CULLEN.
R. L. SENSENICH.
CHARLES B. WRIGHT.

ADDENDA TO REPORT OF BOARD OF TRUSTEES

Report of the Committee on Scientific Research for 1938

The committee has followed its policy to support by small grants promising individual research in various fields of medical interest. During the year seventy-three applications have been considered and forty-five grants have been made. In all cases the money has been turned over to the financial officer of the institution in which the grantee works, with the understanding that it would be subject to requisitions by the grantee and that an accurate account of the expenses would be kept. Practically complete results of work under twenty-nine grants have been published or are in course of publication. The results under eighteen grants prior to 1938 are being prepared for

Financial Statement for 1938

Balance, Jan. 1, 1938.....	\$ 4,161.19
Appropriation for 1938.....	13,750.00
Refund, grant 369.....	35.00
Refund, grant 370.....	2.89
Refund, grant 398.....	48.68
	<hr/>
	\$17,997.76

publication; in the case of forty-three grants prior to 1938 active work is still in progress, but in several cases reports on results have been published. During the year unexpended balances from grants amounting to \$86.57 have been refunded (see financial statement for 1938).

The committee believes that its work should be continued and ventures to recommend that the same appropriation be made for 1939 as for 1938; namely, \$12,500 for grants in aid of medical research and \$1,200 for expenses of the committee.

The financial statement for 1938 is presented, also brief accounts of grants pending at the end of 1937 and a list of grants made in 1938

Respectfully submitted

COMMITTEE ON SCIENTIFIC RESEARCH OF
THE AMERICAN MEDICAL ASSOCIATION
LUDWIG HIKTOFF, Chicago, Chairman
Term expires, 1941
N. W. JONES, Portland, Ore
Term expires, 1939
MARTIN H. FISCHER, Cincinnati
Term expires, 1940
C. C. BASS, New Orleans
Term expires, 1942
JOHN J. MORTON, Rochester, N. Y.
Term expires, 1943

GRANTS AND EXPENSES PAID IN 1938

Grant 484	William Antopol	\$ 250 00
Grant 485	Erwin Chargaff	400 00
Grant 486	Ben Vidgoff	300 00
Grant 487	Felix Saunders	250 00
Grant 488	I. R. Dragstedt and G. M. Dack	600 00
Grant 489	Alexander S. Wiener	200 00
Grant 490	Peter Heinbecker	500 00
Grant 491	Charles G. Johnston	600 00
Grant 492	Solomon Strouse and B. O. Raulston	500 00
Grant 493	George M. Curtis	600 00
Grant 494	Catharine Macfarlane	480 00
Grant 495	Lincoln Oppen and Barnett Sure	600 00
Grant 496	Samuel Soskin	500 00
Grant 497	Albert P. Krueger	300 00
Grant 498	Henry Laurens	351 50
Grant 499	Robert W. Virtue	365 00
Grant 500	Moore E. Mills and Francis D. Gunn	300 00
Grant 501	Arthur H. Smith	200 00
Grant 502	Charles P. Sheldon	31 25
Grant 503	R. C. Robb	800 00
Grant 504	Wallace M. Yater	500 00
Grant 505	Elizabeth S. Russell	250 00
Grant 506	Harry Sobotka	150 00
Grant 507	Joseph H. Roe	500 00
Grant 508	Louis N. Katz	250 00
Grant 509	Roe E. Remington	400 00
Grant 510	Erma A. Smith	150 00
Grant 511	Charles W. Turner	500 00
Grant 512	Barnes Woodhall	350 00
Grant 513	John S. Lawrence	350 00
Grant 514	Samuel R. M. Reynolds	200 00
Grant 515	Robert R. Sealock	400 00
Grant 516	Charles O. Warren	300 00
Grant 517	Irving J. Wolman	170 00
Grant 518	Harold D. West	100 00
Grant 519	D. B. Phemister and Harwell Wilson	400 00
Grant 520	H. E. Carter	250 00
Grant 521	Rucker Cleveland	400 00
Grant 522	Ludwig A. Emge	500 00
Grant 523	Frederick A. Fender	150 00
Grant 524	Ernest Spiegel	300 00
Grant 525	A. R. Buchanan	400 00
Grant 526	Charles T. Code	400 00
Grant 527	Alexander Levy	300 00
Grant 528	Frank Co. Tui	150 00
Clerical expense		600 00
Committee expense		304 60
Printing and supplies		17 54
		<hr/>
		\$16 929 89
Balance on hand		\$ 1 067 87

GRANTS OF COMMITTEE ON SCIENTIFIC RESEARCH

NEW GRANTS—1938

- Grant 484 William Antopol, Newark Beth Israel Hospital, Newark, N. J., \$250, Schwartzman phenomenon
- Grant 485 Erwin Chargaff, Columbia University, \$400, chemistry and physiology of obstructive jaundice
- Grant 486 Ben Vidgoff, University of Oregon Medical School \$300, inhibitory hormone of the germinal epithelial cells of the testis and its effect on the rat prostate
- Grant 487 Felix Saunders, University of Chicago, \$250, isolation of growth factors
- Grant 488 Lester R. Dragstedt and G. M. Dack, University of Chicago \$600, relationship of Bacterium necrophorum to ulcerative colitis
- Grant 489 Alexander S. Wiener, Jewish Hospital of Brooklyn, \$200, agglutinogens in human blood and studies on Kline test
- Grant 490 Peter Heinbecker, Washington University School of Medicine, \$500, pituitary regulation of water balance in the dog
- Grant 491 Charles G. Johnston, Wayne University College of Medicine, Detroit, \$660, intestinal obstruction
- Grant 492 Solomon Strouse and B. O. Raulston, University of Southern California, \$500, sodium potassium relationship in diabetes
- Grant 493 George M. Curtis, Ohio State University, \$600, iodine and calcium metabolism in thyroid disease

Grant 494 Catharine Macfarlane, Woman's Medical College of Pennsylvania, \$480, value of periodic pelvic examination in detecting cancer of the uterus

Grant 495 Lincoln Oppen and Barnett Sure, University of Arkansas, \$600, relation of vascular disease to avitaminosis in the rat

Grant 496 Samuel Soskin, Michael Reese Hospital, Chicago, \$500, laboratory tests for endocrine dysfunction

Grant 497 Albert P. Krueger, University of California, \$300, bacteriophage

Grant 498 Henry Laurens, Tulane University, \$351 50, lowering of arterial pressure by carbon arc radiation

Grant 499 Robert W. Virtue, University of Denver, \$365, formation of bile acids

Grant 500 Moore E. Mills and Francis D. Gunn, Northwestern University Medical School, \$300, experimental pulmonary tuberculosis in dogs

Grant 501 Arthur H. Smith, Wayne University College of Medicine, Detroit, \$200, serum proteins in relation to blood volume

Grant 502 Charles P. Sheldon, Harvard University, \$31 25, respiration in pregnancy and labor

Grant 503 R. C. Robb, Syracuse University College of Medicine, \$800, diseases in twins

Grant 504 Wallace M. Yater, Georgetown University Medical School, \$500 histopathology of "bundle branch" block

Grant 505 Elizabeth S. Russell, Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Me., \$250, genetics of tumors in the fruit fly

Grant 506 Harry Sobotka, Mount Sinai Hospital, New York, \$150, monomolecular layers of physically active substances

Grant 507 Joseph H. Roe, George Washington University, \$500, vitamin C content of plant, animal and tumor tissue

Grant 508 Louis N. Katz, Michael Reese Hospital, Chicago, \$250 factors influencing activities of the heart

Grant 509 Roe E. Remington, Medical College of the State of South Carolina, \$400, iodine deficiency in the rat

Grant 510 Erma A. Smith, Iowa State College, \$150, influence of various substances on gastrointestinal motility

Grant 511 Charles W. Turner, University of Missouri, \$500 relation of thyrotropic hormone of anterior pituitary to pregnancy and lactation

Grant 512 Barnes Woodhall, Duke University Hospital, \$300, reactions to implanted Shope rabbit papilloma by cerebral tissue

Grant 513 John S. Lawrence, University of Rochester, \$350, transmissible agranulocytosis in the cat

Grant 514 Samuel R. M. Reynolds, Long Island College of Medicine, \$200, action of oestrin on small blood vessels

Grant 515 Robert R. Sealock, University of Rochester, \$400, relation of metabolism of melanin pigment precursors to vitamin C requirements

Grant 516 Charles O. Warren, Jr., Cornell University Medical College, \$300, metabolism of bone marrow

Grant 517 Irving J. Wolman, Children's Hospital of Philadelphia, \$170, lipid pneumonia

Grant 518 Harold D. West, Meharry Medical College, \$100, synthesis of *d*-threonine

Grant 519 D. B. Phemister and Harwell Wilson, University of Chicago, \$400 mechanism of blood pressure in sympathectomized dogs

Grant 520 H. E. Carter, University of Illinois, \$250, betaines of aminohydroxy acids

Grant 521 Rucker Cleveland, Vanderbilt University, \$400, cytology of endometrium

Grant 522 Ludwig A. Emge, Stanford University School of Medicine, \$500, relation of sex hormones to tumor growth

Grant 523 Frederick A. Fender, Stanford University School of Medicine, \$150, development of device for direct neurologic stimulation

Grant 524 Ernest Spiegel, Temple University, \$300 physicochemical factors influencing the excitability of the central nervous system

Grant 525 A. R. Buchanan, University of Mississippi, \$400, vesicular mechanism

Grant 526 Charles T. Code, University of Minnesota, \$400, metabolism of histamine

Grant 527 Alexander Levy, University of Oregon Medical School, \$300, occlusion of the coronary arteries

Grant 528 Frank Co. Tui, New York University, \$150, relation between Schwartzman agent and pyrogen

STATE OF WORK UNDER PREVIOUS GRANTS

1 COMPLETED DURING THE YEAR

Grant 174, 1930 Alfred R. Roos, College of Medical Evangelists, Loma Linda, Calif., \$1,455, hay fever pollens in the Southwest. The reports and maps describing the results of work on the different groups of plants will be published by the Department of Agriculture of the state of California

Grant 277, 1933 Gustav Zechel, University of Illinois College of Medicine, \$260, study of growing malignant cells by moving photomicrographs. Zechel, Gustav, and Morgenster, O. A. Timing Device for Talking Motion Pictures, *Science* 81:23, 1935. Zechel, Gustav. A Simple Method of Obtaining Blood from the Rat in the Preparation of Plasma for Tissue Culture, *Arch. f. exper. Zellforsch.* 18:142, 1935. Zechel, Gustav. An Improved Tissue Culture Chamber, *Science* 87:264, 1938

Grant 343, 1934 John Guttman, Post Graduate Medical School and Hospital, \$400, relation between electrical disturbances in cochlea and the sensation of hearing. Guttman, John, and Barrera, S. E. The Electrical Potentials of the Cochlea and Auditory Nerve in Relation to Hearing, *Am. J. Physiol.* 120:666, 1937

Grant 348, 1935. Phillips Thygeson. State University of Iowa, \$400, trachoma and 'inclusion virus' disease of the genito-urinary tract. Thygeson, Phillips and Mengert, W. F. The Virus of Inclusion Conjunctivitis. *Arch Ophthalmol* 15:377, 1936. Thygeson Phillips, Proctor, Francis I, and Richards, Polk. Etiologic Significance of the Elementary Body in Trachoma. *Am J Ophthalmol* 18:811, 1935. Thygeson, Phillips, and Richards, Polk. Nature of the Filtrable Agent of Trachoma. *Arch Ophthalmol* 20:569, 1938. Thygeson Phillips. The Cultivation of Human Conjunctival and Corneal Epithelium in Vitro. *Am J Ophthalmol* to be published.

Grant 356, 1935. J. C. Davis. University of Minnesota, \$500 coronary flow and lesions of the aortic valves. See grant 463, 1937. Davis, J. C. An Analysis of the Factors Involved in the Changes in Coronary Flow in Aortic Stenosis and Regurgitation. *Am J Physiol* 123:50, 1938.

Grant 365, 1935. Ludwig A. Emge, Stanford University School of Medicine, \$300 effect of castration on malignant tumors. Emge Ludwig A., and Murphy, Kathleen M. Effect of Rapidly Repeated Pregnancies on Transplantable Mammary Rat Adenofibromas. *Proc Soc Exper Biol & Med* 37:620, 1938. Emge Ludwig A., Murphy, Kathleen M., and Schilling, Walter. Effect of Theelin on Transplantable Mammary Rat Adenofibroma. *ibid* 38:21, 1938. Emge Ludwig A. Schilling, Walter and Wulff, L. M. R. Effect of Pregnancy on the Growth of Rat Sarcoma. *ibid*, p. 338. Emge, Ludwig A. Sarcomatous Degeneration of Transplantable Mammary Adenofibroma of the White Rat. *Arch Pathol* 26:429, 1938. Murphy, Kathleen M., Schilling, Walter and Emge Ludwig A. Effect of Prolonged Theelin Injections on Transplantable Mammary Adenofibroma. *Proc Soc Exper Biol & Med* 39:298, 1938. Emge, Ludwig A., and others. The Influence of Long Continued Injections of Estrogen on Mammary Tissue. *Am J Obst & Gynec* 36:750, 1938.

Grant 370, 1935. Richard L. Crouch. University of Missouri, \$500 connections of diencephalon (refund \$289). Crouch Richard L., and Thompson, John K. The Efferent Fibers of the Thalamus of *Microtus kheesus*. *J Comp Neurol* 69:255, 1938. Crouch, Richard L. and Thompson, John K. Termination of the Brachium Conjunctivum in the Thalamus of the Macaque Monkey. *ibid*, p. 449. Other papers in course of publication.

Grant 378, 1935. Wallace M. Yater, Georgetown University Hospital Washington, D. C. histopathologic basis of "bundle branch" block. See grant 504, 1938. Yater, Wallace M. The Morbid Anatomy of Bundle Branch Block. *M Ann District of Columbia* 7:1 and 54, 1938. Yater, Wallace M. Pathogenesis of Bundle Branch Block. *Arch Int Med* 62:1, 1938.

Grant 380, 1935. N. W. Popoff, Highland Hospital, Rochester N. Y., \$600, arteriovenous anastomosis. Popoff, Nicholas W. Epithelial Functional Regeneration. *Arch Pathol* to be published.

Grant 402, 1936. C. H. Thienes and L. T. Samuels, University of Southern California, \$500 carbohydrate metabolism as influenced by the hypophysis. See grant 453, 1937. Samuels, L. T., and others. Glycogen Formation After Alanine Administration in Adrenalectomized Animals. *Proc Soc Exper Biol & Med* 35:538, 1937. Bill H. A. and Samuels, L. T. The Effect of Cortical Extract on the Glucose Tolerance of Adrenalectomized Rats. *ibid*, p. 633. Samuels, L. T., Schott, H. T. and Ball Howard A. Carbohydrate Metabolism Studies in Hypophysectomized Rats. II. The Relation of the Hypophysis and Adrenal Cortex to the Removal of Excess Glucose from the Blood of Rats. *Am J Physiol* 120:649, 1937.

Grant 418, 1936. Frank W. Allen, University of California, \$200, nucleotide of the red corpuscles. See grant 464, 1937. Eiler, John J., and Allen Frank W. The Catabolism of the Purine Nucleotides. I. The Relation to Glycolysis in the Blood of the Rabbit. *J Biol Chem* 123:655, 1938.

Grant 427, 1936. Helen S. Mitchell. Massachusetts State College, \$300, nutritional cataract in rats. Mitchell, Helen S., and Cook Gladys M. Influence of Protein or Cystine Intake on Cataract Producing Action of Galactose. *Proc Soc Exper Biol & Med* 36:806, 1937. Mitchell Helen S., Merriam, Olean A., and Cook Gladys M. The Relation of Ingested Carbohydrate to the Type and Amount of Blood and Urine Sugar and to the Incidence of Cataract in Rats. *J Nutrition* 13:501, 1937. Mitchell Heier S., and Cook, Gladys M. Galactose Cataract in Rats. *Arch Ophthalmol* 15:22, 1938.

Grant 428, 1936. D. B. Phemister, K. Grimson and H. Wilson University of Chicago, \$400, effect of sympathectomy on blood pressure in dogs. See grant 476, 1937. Grimson, Keith S., Wilson, Harwell and Phemister, Dallas B. The Early and Remote Effects of Total and Partial Paravertebral Sympathectomy on Blood Pressure. *Ann Surg* 106:801, 1937.

Grant 430, 1936. S. W. Ranson, Northwestern University Medical School, \$315, fever producing agents. Ranson S. W. Jr. Fever Induced by the Intravenous Injection of Typhoid Paratyphoid Vaccine. *Arch Int Med* 61:285, 1938. Other papers in course of publication.

Grant 433, 1936. Frederick Lemere, Eastern State Hospital, Medical Lake, Wash. \$500, Berger brain rhythms in psychotic patients. Lemere Frederick. Effects of Electroencephalogram of Various Agents Used in Treating Schizophrenia. *J Neurophysiol* 1:590, 1938.

Grant 435, 1936. Warren O. Nelson, Wayne University College of Medicine Detroit, \$300, effect of synthetic androgenic substances. See grant 481, 1937. Nelson, Warren O., and Merckel, Charles G. Effects of Androgenic Substances in the Female Rat. *Proc Soc Exper Biol & Med* 36:823, 1937. Nelson, Warren O., and Merckel, Charles G. Maintenance of Spermatogenesis in Testis of the Hypophysectomized Rat with Sterol Derivatives. *ibid*, p. 825. Nelson, Warren O., and Hickman, Jane. Effect of Oestrone on Hypophyses and Reproductive Organs of Thyroidectomized Rats. *ibid*, p. 828. Nelson, Warren O. Some Factors Involved in the Control of the Gametogenic and Endocrine Functions of the Testis. *Cold Spring Harbor Symposia on Quantitative Biology* 5:

123, 1937. Nelson, W. O., and Merckel C. G. Maintenance of Spermatogenesis in Hypophysectomized Mice with Androgenic Substance. *Proc Soc Exper Biol & Med* 38:737, 1938.

Grant 436, 1936. Albert P. Krueger, University of California, \$300 nature of bacteriophage. See grant 497, 1938. Krueger, A. P. and Mundell J. H. Effect of Phage on Electrokinetic Potential of Susceptible Cells. *Proc Soc Exper Biol & Med* 36:317, 1937. Krueger A. P. The Mechanism of Bacteriophage Production. *Science* 86:39, 1937. Scribner, I. J., and Krueger, A. P. The Effect of NaCl on the Phage Bacterium Reaction. *J Physiol* 21:1, 1937. Krueger Albert P., and Tong, Jacob. The Relationship Between Bacterial Growth and Phage Production. *ibid*, p. 137. Krueger, A. P., and Streutmann W. L. Effect of Sodium Sulfate on the Phage Bacterium Reaction. *J Gen Physiol*, to be published. Krueger, A. P., and Mundell J. H. Demonstration of Phage Precursor in the Bacterial Cell. *Science* to be published.

Grant 438, 1937. Irving Graef, New York University, \$300 pulmonary reactions to lipids and mineral oils. Graef Irving, Kaufmann William, and Kaplan Leo. Experimental Studies of Tissue Reactions to Lipids. I. The Formation of Acid Fast Membranes Around Certain Oils and Waxes. *Arch Pathol* 26:914, 1938. Other papers in course of publication.

Grant 439, 1937. Moore A. Mills, Northwestern University Medical School, \$300, experimental pulmonary tuberculosis in the dog. See grant 500, 1938. Mills, Moore A., and Colwell, Charlotte A. Cutaneous Reactivity to Tuberculin in the Dog. *Proc Soc Exper Biol & Med* 37:470, 1937. Mills, Moore A., Gunn, Francis D. and Barth E. E. Experimental Pulmonary Tuberculosis in the Dog. *J Bact* 35:453, 1938.

Grant 440, 1937. M. M. Wintrobe, Johns Hopkins University, \$400 red corpuscles. Wintrobe Maxwell M., Mitchell D. M. and Kolb L. C. Sensory Neuron Degeneration in Vitamin Deficiency. *J Exper Med* 68:207, 1938. Wintrobe, Maxwell M. Experiments with Young Pigs on an Artificial Diet, to be published.

Grant 446, 1937. Samuel Soskin, Michael Reese Hospital Chicago, \$500 hormone assay of blood and urine in endocrine dysfunction. See grant 496, 1938. Freed, S. C., Mesirou, S. D., and Soskin Samuel. On the Composite Nature of the Estrus Phenomenon. *Endocrinology* 21:731, 1937. Freed, S. C., and Soskin, Samuel. Cyclic Inhibitory Influence of the Rat's Ovary on the Uterine Response to Estrin. *Proc Soc Exper Biol & Med* 38:391, 1938.

Grant 454, 1937. George M. Curtis, Ohio State University, \$600 iodine and calcium balance in thyroid disease. See grant 493, 1938. Curtis George M., and Puppel, Italo D. The Iodine Metabolism in Exophthalmic Goiter. *Ann Surg* 108:574, 1938. Puppel Italo D. and Curtis, George M. The Iodine Balance in Exophthalmic Goiter. *Arch Pathol* 26:1093, 1938.

Grant 457, 1937. James B. Hamilton Albany Medical College, \$450 testicular descent by administration of male hormone. Hamilton James B. The Effect of Male Hormone upon the Descent of the Testes. *Anat Rec* 70:531, 1938. Hamilton, James B., and Hubert Gilbert. Effect of Synthetic Male Hormone Substance on Descent of Testicles in Human Cryptorchidism. *Proc Soc Exper Biol & Med* 39:4, 1938.

Grant 459, 1937. John S. Lawrence, Strong Memorial Hospital Rochester N. Y., \$450, antiserum for white blood cells. See grant 513, 1938. Lawrence, J. S., and Syverton J. T. Spontaneous Agranulocytosis in the Cat. *Proc Soc Exper Biol & Med* 38:914, 1938. Lawrence John S., Pearce Herman E., and Mider G. B. The Effect of Experimental Neutropenia on the Healing of Wounds. *Arch Pathol* to be published.

Grant 461, 1937. Roe E. Remington, Medical College of the State of South Carolina, \$400, quantitative effect of iodine deficiency in the rat. See grant 509, 1938. Remington Roe E. Effect of Chloride on the Thyroid Gland. *Proc Soc Exper Biol & Med* 37:652, 1938. Remington, Roe E., and Remington John W. Effect of Enhanced Iodine Intake on Growth and on the Thyroid Glands of Normal and Goitrous Rats. *J Nutrition* 15:539, 1938. Remington Roe E. Does Fat in the Diet Affect the Thyroid. *ibid*, to be published. Harris Philip L. and Remington, Roe E. The Effect of Yeast and of Thiamin on the Production of Low Iodine Goiter. *ibid*, to be published.

Grant 468, 1937. Vally Menkin, Harvard Medical School, \$300 mechanism of inflammation. Menkin, Vally. Studies on Inflammation. XIV. Isolation of the Factor Concerned with Increased Capillary Permeability in Injury. *J Exper Med* 67:129, 1938. Menkin Vally. Studies on Inflammation. XV. Concerning the Mechanism of Cell Migration. *ibid*, p. 145. Menkin, Vally. Studies on Inflammation. XVI. On the Formation of a Chemotactic Substance by Enzymatic Action. *ibid*, p. 153. Menkin, Vally. Mechanism of Inflammation. *Arch Pathol* 24:65, 1938. Menkin Vally. The Role of Inflammation in Immunity. *Physiol Rev* 18:366, 1938. Menkin Vally. Studies on Inflammation. XVII. Direct Effect of Changes in the Hydrogen Ion Concentration on Leukocytes. *Arch Pathol* to be published.

Grant 470, 1937. Peter Heinbecker, Washington University School of Medicine, \$350, pituitary regulation of water exchange and effect of diet on dextrose tolerance and insulin response in dogs. See grant 490, 1938. White, H. L., and Heinbecker, Peter. Observations on Creatinine and Urea Clearances, on Responses to Water Intgestion and on Concentrating Power of Kidneys in Normal Diabetes. *Insipidus and Hypophysectomized Dogs*. *Am J Physiol* 123:566, 1938.

Grant 475, 1937. Joseph T. King, University of Minnesota, \$375, physiology and sulfanilamide. King, Joseph T. The Effect of Sulfanilamide on Blood Leukocytes. *Am J Physiol* 123:119, 1938. King Joseph T., Henschel, Austin F., and Green Beryl S. Influence of Pronitrosol Soluble on Beta Hemolytic Streptococci Growing in Tissue Culture Media. *Proc Soc Exper Biol & Med* 38:810, 1938. King Joseph T.; Green, Beryl S., and Henschel Austin F. Response of Leukocytes to Colonies of Streptococci Growing in Tissue Culture Media. *ibid*, p. 812.

Grant 476 D B Phemister and Keith Grimson, University of Chicago, \$400, effect of sympathectomy in dogs See grants 428, 1936, and 519, 1938

2 INCOMPLETE

A Work under the grant completed, account rendered of expenses but results not published fully

Grant 286, 1933 F H Pike, Columbia University, \$600, the effects of successive experimental lesions of the nervous system

Grant 308, 1933 John L Ulrich, Johns Hopkins University, \$250, the reflex system in the cat See grant 372, 1935

Grant 309, 1933 Carroll L Birch, University of Illinois School of Medicine, \$300, assay of urine for sex hormone of the anterior pituitary

Grant 367, 1935 Robert Gault and A C Ivy, American Institute for the Deaf Blind, Evanston, Ill., \$600, mechanical stimulation of the vibrotactile organs See grant 412, 1936

Grant 379, 1935 Victor C Myers (Donald E Bowman), Western Reserve Medical School, \$650, chemical test for pregnancy

Grant 382, 1935 L Goodman, A J Geiger and L Chaborn, Yale University, \$250, antinuclear principle

Grant 398, 1936 George A Emerson, West Virginia University, Morgantown \$175, methylic products of sympathomimetic amines (refund, \$48 68)

Grant 401, 1936 W. T Dawson, University of Texas, Galveston, \$200, toxicity of cardiac glucosides

Grant 407, 1936 Ralph I Dorfman, Louisiana State University, \$250, estrogenic substance in human urine and other estrogenic compounds

Grant 412, 1936 Robert H Gault and A C Ivy, American Institute for the Deaf Blind, Evanston, Ill., \$400, stimulation of vibrotactile organs by mechanical vibrations See grant 367, 1935

Grant 416, 1936 Jean Broadhurst, Teachers College, Columbia University, \$200, inclusion bodies in the female genital area

Grant 431, 1936 Benjamin Harrow, College of the City of New York, \$200 purification of the hyperglycemic factor in urine

Grant 447, 1937 R C Herrin, University of Wisconsin, \$400, urea clearance

Grant 448, 1937 Warren H Cole, University of Illinois College of Medicine, \$500, cholesterol tolerance as an index of hyperthyroidism and study of excretory function of the liver

Grant 452, 1937 G Albin Matson, Montana State University, Missoula, \$100, antigenic properties of certain chemical substances

Grant 465, 1937 Fred L Hummoller, Loyola University School of Medicine, Chicago, \$300, toxic principles in culture fluids of *Bacterium enteritidis*

Grant 469, 1937 Joseph Krafka Jr, University of Georgia School of Medicine, \$370, elastometric measurements on smooth muscle and connective tissue Krafka, Joseph, Jr Comparative Study of the Histophysics of the Aorta, *Am J Physiol*, to be published

Grant 471, 1937 Timothy Leary, Office of Medical Examiner, Boston, \$500, early atherosclerotic processes and relation of cholesterol to neo plastic growth

Grant 493, 1938 George M Curtis, Ohio State University, \$600, iodine and calcium metabolism in thyroid disease See grant 454, 1937

B ACTIVE WORK STILL IN PROGRESS

Grant 254, 1932 J Lisle Williams, Rush Medical College, Chicago, \$200, decreased dextrose tolerance in acute infectious diseases

Grant 372, 1935 John L Ulrich, Johns Hopkins University, \$450, cerebral functions in the action of antagonistic muscles See grant 308, 1933

Grant 310, 1934 Lay Martin, Johns Hopkins University, \$150, study of gastric juice See grant 462, 1937

Grant 324, 1934 William deB MacNider, University of North Carolina, \$285, study of artificial circulation in the kidney

Grant 337, 1934 James L O'Leary, Washington University, \$245, Loven reflexes Bishop, G H, and O'Leary, James Pathways Through the Sympathetic Nervous System in the Bullfrog, *J Neurophysiol* 1: 442 1938

Grant 344, 1934 Paul L Day and W C Langston, University of Arkansas School of Medicine, \$300, effect of withdrawal of vitamin G from diet of monkeys Shukers Carroll F, Langston, William C, and Day, Paul L The Normal Blood Picture of the Young Rhesus Monkey, *Folia haemat* 60: 416, 1938 Day, Paul L, Langston, William C, and Darby, William J Failure of Nicotinic Acid to Prevent Nutritional Cytopenia in the Monkey, *Proc Soc Exper Biol & Med* 38: 860, 1938 Langston, William C, Darby, William J, Shukers, Carroll F, and Day, Paul L Nutritional Cytopenia (Vitamin B Deficiency) in the Monkey, *J Exper Med* 68: 923, 1938

Grant 350, 1935 Frederic A Gibbs, Harvard University School of Medicine, \$100, fiber system in the cat's brain concerned in convulsions Gibbs, Erna Leonhardt, and Gibbs, Frederic Andrews A Purring Center in the Cat's Brain, *J Comp Neurol* 64: 209, 1936

Grant 355, 1935 Royall M Calder, San Antonio, Texas, \$150, mechanism of pneumococcal inflammation

Grant 388, 1935 Tracy J Putnam, Boston City Hospital, Boston, \$150, effect of low voltage current on nervous system Alexander, Leo Clinical and Neuropathological Aspects of Electrical Injuries, *J Indust Hyg & Toxicol* 20: 191, 1938 Alexander, Leo Electrical Injuries to Central Nervous System, *M Chin North America* 22: 663, 1938

Grant 397, 1936 R F Hanzal, Western Reserve University, \$150, source of endogenous uric acid and the effects of methylated xanthines on its secretion

Grant 410, 1936 H E Eggers, University of Nebraska, \$200, effect of tetra methyl arsonium gluconate on human cancer

Grant 413, 1936 Philip Levine, Newark Beth Israel Hospital, Newark, N J, \$350, bacteriophage action in the dysentery group Levine, Philip, and Perlstein, David Phage Specific Heat Labile Factors in *B Dysenteriae* Sonne, *Proc Soc Exper Biol & Med* 36: 295, 1937

Grant 415, 1936 Gordon H Scott, Washington University, St Louis, \$300, lead and aluminum in cerebrospinal fluid Scott, Gordon H, and McMillen, J Howard Spectrographic Analyses of Human Spinal Fluid, *Proc Soc Exper Biol & Med* 35: 287, 1936 McMillen, J Howard, and Scott, Gordon H Spectrographic Studies of Lead in Human Blood, *ibid*, p 364

Grant 420, 1936 Arthur Knudson, Albany Medical College, \$400, synthesis of cholesterol in the animal body

Grant 423, 1936 Alfred Gilman, Yale University, \$300, physiology of the antidiuretic hormone of the posterior pituitary Gilman, Alfred, and Goodman, Louis Secretary Response of the Posterior Pituitary to the Need for Water Conservation, *J Physiol* 90: 113, 1937

Grant 434, 1936 Wilbert H McGaw, Western Reserve University, \$500, sound conduction in fractured bones

Grant 441, 1937 Edward S West and G E Burget, University of Oregon Medical School, \$350, diuretic action and chemical metabolism of sorbitol

Grant 442, 1937 S J Crowe, Johns Hopkins University, \$480, physiology of hearing

Grant 443, 1937 Ernest Carroll Faust, Tulane University, \$300, epidemiology of trichinosis in New Orleans Sawitz, Willi Are Post mortem Statistics on Trichinosis Valid for the Living Population? *Am J Pub Health* 27: 1023, 1937 Sawitz, Willi Studies on Trichinella Spiralis in the New Orleans Area *Arch Path*, to be published

Grant 444, 1937 George Herrmann University of Texas, Galveston, \$300, chemistry of the heart muscle Herrmann, George, and Erhard, Peter Total Creatinine, Phosphates, Calcium and Potassium in Normal and Infarcted Myocardium of the Dog, *Proc Soc Exper Biol & Med* 38: 35, 1938

Grant 445, 1937 Paul M Levin, Johns Hopkins University, \$250, cerebral efferent tracts in primates Levin, Paul M A Nervous Structure in the Pineal Body of the Monkey, *J Comp Neurol* 68: 405, 1938 Levin, Paul M, and Bradford, F Keith The Exact Origin of the Corticospinal Tract in the Monkey, *ibid*, p 411

Grant 449, 1937 Charles W Turner, University of Missouri, \$250, pituitary hormones See grant 511, 1938

Grant 451, 1937 Frank Co Tui, New York University, \$200, Schwartz man phenomenon and pyrogenic reaction See grant 528, 1938

Grant 453, 1937 L T Samuels and C H Thienes, University of Southern California, \$300, hypophysis in metabolism of carbohydrate fat and metabolism See grant 402, 1936

Grant 455, 1937 Elizabeth S Russell, Roscoe B Jackson Memorial Laboratory, Bar Harbor, Me., \$225, genetics of tumors in the fruit fly See grant 505, 1938

Grant 456, 1937 Ira A Manville, University of Oregon Medical School \$500, relation of degenerative changes in connective tissue to glycerone metabolism

Grant 458, 1937 Orthello R Langworthy, Johns Hopkins University, \$350, effect of ovulation and pregnancy on smooth muscle of urinary bladder Langworthy, O R, and Brack, C B The Effect of Pregnancy and Corpus Luteum on Vesical Muscle, *Am J Obst & Gynec*, to be published

Grant 460, 1937 M G Seelig, Barnard Free Skin and Cancer Hospital, St Louis, \$250, carcinogenicity of heterocyclic hydrocarbons

Grant 462, 1937 Lay Martin, Johns Hopkins University, \$200, gastric juice See grant 310, 1934

Grant 463, 1937 Jay Conger Davis, Minneapolis, \$600, action of certain drugs on the coronary arteries See grant 356, 1935

Grant 464, 1937 Frank W Allen, University of California, \$200, relation of nucleotide fraction of red corpuscles to glycolysis See grant 418, 1936

Grant 466, 1937 G Louis Weller Jr, George Washington University, \$275, effect of sodium pyruvate and other substances on vitamin B deficiency

Grant 467, 1937 B O Barnes, Rush Medical College, \$300, extract of adrenals

Grant 472, 1937 Margaret Lasker, Yonkers, N Y, \$200, incidence of pentosuria and fructosuria

Grant 473, 1937 Roy H Turner, Tulane University, \$400, physiology of blood vessels in man

Grant 474, 1937 Marion Fay, Woman's Medical College of Pennsylvania, \$275, biochemistry of strontium

Grant 477, 1937 Irving J Wolman, University of Pennsylvania, \$335, lipid pneumonia See grant 517, 1938

Grant 478, 1937 Martin Silberberg, Washington University School of Medicine, \$600, influence of hormones on bone growth Silberberg, Martin, and Silberberg, Ruth Influence of Cattle Anterior Pituitary Extract on Endochondral Ossification in Young Ovariectomized Pigs, *Proc Soc Exper Biol & Med* 37: 446, 1938

Grant 479, 1937 Tracy J Putnam, Boston City Hospital, \$200, injuries to the cervical cord

Grant 480, 1937 Amy L Daniels, State University of Iowa, \$250, relation of fluorine to physiologic function

Grant 481, 1937 Warren O Nelson, Wayne University College of Medicine, Detroit, \$200, synthetic androgenic substances See grant 435, 1936

Grant 482, 1937 Warren O Nelson, Wayne University College of Medicine, Detroit, \$400, effect of thymus gland on the growth of rats Janes, Ralph G, and Segaloff, Albert Growth and Metamorphosis of Anuran Larvae on Thymus Extracts, *Proc Soc Exper Biol & Med* 39: 172, 1938

Grant 483, 1937: J. M. Johlin, Vanderbilt University School of Medicine, \$250, attenuation of toxins by interfacial adsorption. Johlin, J. M.: Attenuation of Toxins by Interfacial Adsorption, *Proc. Soc. Exper. Biol. & Med.* **38**: 568, 1938.

3. NO RESULTS PUBLISHED

Grant 386, 1935: E. V. McCollum, Johns Hopkins University, \$150, adaptation of the eyes to subdued light and its relation to vitamin A (refund, \$19.65).

Report of Committee on Therapeutic Research

The Committee on Therapeutic Research, a standing committee of the Council on Pharmacy and Chemistry, encourages scientific investigations in the field of therapeutics by providing funds for the prosecution of necessary research.

During the year 1938 the Committee issued thirty-seven new grants. A detailed list of these grants, together with a list of publications during 1938, and of unexpired grants made before Jan. 1, 1938, will be found in the appendix to this report.

The following is a list of the investigations conducted with the assistance of grants made by the Committee on Therapeutic Research, reports of which were published during 1938:

1. The Effect of Supplementary Lysine, Methionine and Cystine on the Production of Fatty Livers by High Fat Diets Containing Gliadin, Helen F. Tucker and Henry C. Eckstein: *J. Biol. Chem.* **126**: 117 (Nov.) 1938.
2. The Effect of Sodium Amytal, Sodium Barbitol and Nembutal on the Electrocardiogram, Roberta Hafkeshring and Winona MacCalmont: *J. Pharmacol. & Exper. Therap.* **64**: 43 (Sept.) 1938.
3. Clinical Excretion of Bismuth: V. Excretion of Solbisminol and of Some Other Bismuth Preparations for Oral Administration, Torald Sollmann, H. N. Cole, Katharine Henderson and collaborators: *Arch. Dermat. & Syph.* **37**: 993 (June) 1938.
4. Bismuth Studies: V. The Bismuth Absorption from the Site of Injection in Dogs, Torald Sollmann and Katharine Henderson: *Am. J. Syph., Gonorr. & Ven. Dis.* **22**: 286 (May) 1938.
5. Clinical Excretion of Bismuth: VII. The Autopsy Distribution of Bismuth in Patients After Clinical Bismuth Treatment, Torald Sollmann, H. N. Cole, Katharine Henderson and collaborators: *Am. J. Syph., Gonorr. & Ven. Dis.* **22**: 555 (Sept.) 1938.
6. Bismuth Studies: VIII. Bismuth Distribution in Dogs Following Intramuscular Injection of a Single Dose of Various Bismuth Preparations, Torald Sollmann and Katharine Henderson: *Am. J. Syph., Gonorr. & Ven. Dis.* **22**: 739 (Nov.) 1938.
7. Combination Courses of Bismuth Administration, Torald Sollmann, H. N. Cole, Katharine Henderson and collaborators: *J. A. M. A.* **111**: 2175 (Dec. 10) 1938.
8. The Effect of Protosil and Related Compounds upon the Chemotropism of Leukocytes, Dale Rex Coman: *Am. J. M. Sc.* **196**: 273 (Aug.) 1938.
9. Studies in Chemotropism: Source of Substances Attracting Polymorphonuclear Leukocytes to Bacteria, Harold M. Dixon and Morton McCutcheon: *Proc. Soc. Exper. Biol. & Med.* **38**: 378 (April) 1938.
10. The Action of Histidine on the Gastrointestinal Tract, Louis S. Goodman and Philip A. Bearr: *Am. J. Digest. Dis.* **5**: 117 (April) 1938.
11. The Action of Excess Na, Ca and K on the Coronary Vessels, L. N. Katz and E. Lindner: *Am. J. Physiol.* **124**: 155 (Oct.) 1938.
12. Effects of Various Drugs on the Coronary Circulation of the Denervated Isolated Heart of the Dog and Cat: I. Observations on Epinephrine, Acetylcholine, Acetyl- β -Methylcholine, Nitroglycerin, Sodium Nitrite, Pitressin and Histamine, L. N. Katz, E. Lindner, W. Weinstein, D. I. Abramson and K. Jochim: *Arch. internat. de pharmacodyn. et de therap.* **49**: 400 (Aug. 31) 1938.
13. The Distribution of the Coronary Blood Flow, L. N. Katz, K. Jochim and W. Weinstein: *Am. J. Physiol.* **122**: 252 (April) 1938.
14. Further Studies on the Pulse Wave in the Aorta and Its Branches, Philip Dow and W. F. Hamilton: *Am. J. Physiol.* **123**: 54 (July) 1938.
15. Blood Pressure Values in Street Dogs, W. F. Hamilton, E. R. Pund, A. W. Simpson, Jr., G. M. Colson and H. W. Coleman: *Am. J. Physiol.* **123**: 88 (July) 1938.
16. Pulmonary Arterial, Venous and Differential Pressure in the Unanesthetized Dog, R. A. Woodbury, W. F. Hamilton and Elkin Vogt: *Am. J. Physiol.* **123**: 220 (July) 1938.
17. The Rate of Utilization of Vitamin A and Carotene by Normal and Diabetic Dogs, Elaine P. Ralli and Arthur C. Pariente: *Am. J. Physiol.* **123**: 166 (July) 1938.
18. Relation Between Size of Dose and Lipotropic Effect of Choline Chloride in Mice, Mary Scott Welch and Arnold DeM. Welch: *Proc. Soc. Exper. Biol. & Med.* **39**: 5 (Oct.) 1938.
19. Lipotropic Action of Certain Compounds Related to Choline Chloride, Arnold DeM. Welch and Mary Scott Welch: *Proc. Soc. Exper. Biol. & Med.* **39**: 7 (Oct.) 1938.
20. The Chemical Nature and Nomenclature of Choline Derivatives, Arnold DeM. Welch: *Science* **88**: 333 (Oct. 7) 1938.
21. A New Method for Determination of Iodine in Five Cubic Centimeters of Blood or Other Biological Material, J. F. McClelland, A. Calvin Bratton, Ralph V. White and William C. Foster: *J. Biol. Chem.* **123**: 699 (May) 1938.

22. Determination of "Hormone Iodine" in 5 Cc. Blood, J. F. McClelland and William Foster: *Proc. Soc. Exper. Biol. & Med.* **39**: 210 (Nov.) 1938.

23. Determination of Iodine in Drinking Water, Urine and Substances Containing Only About 1,000 Times as Much Organic Matter as Iodine, A. C. Bratton, J. F. McClelland, William Foster and Ralph White. *Indust. & Engin. Chem.* **10**: 600 (Oct. 15) 1938.

24. Changes With Age in the Cardiac Output in Adult Men, William Hall Lewis Jr.: *Am. J. Physiol.* **121**: 517 (Feb.) 1938.

25. Experimental Infection in the Mouse Produced by Intratracheal Inoculation with *Hemophilus Pertussis*, William L. Bradford: *Am. J. Path.* **14**: 377 (May) 1938.

26. An Attempt to Increase Resistance to Pertussis in Newborn Infants by Immunizing Their Mothers During Pregnancy, John A. Lichty Jr., Betty Slavin and William L. Bradford: *J. Clin. Investigation* **17**: 613 (Sept.) 1938.

27. The Reaction of the Epiphyseal Cartilage in Normal and Rachitic Rats, J. A. Pierce: *J. Biol. Chem.* **124**: 115 (June) 1938.

28. Pathologic Effects of Elixir of Sulfanilamide (Diethylene Glycol) Poisoning, E. M. K. Gelling and Paul R. Cannon: *J. A. M. A.* **111**: 919 (Sept. 3) 1938.

29. Analysis of the Circulatory Actions of Ethylmorphine, W. M. Cameron, J. M. Crismon, L. J. Whitsell and M. L. Tainter: *J. Pharmacol. & Exper. Therap.* **62**: 318 (March) 1938.

30. Further Evidence on the Nature of the Vasomotor Actions of Ethylmorphine, W. M. Cameron, L. J. Whitsell, J. M. Crismon and M. L. Tainter: *J. Pharmacol. & Exper. Therap.* **63**: 340 (July) 1938.

31. Action of Sympathomimetic Amines on the Heart-Lung Preparation, J. M. Crismon and M. L. Tainter: *J. Pharmacol. & Exper. Therap.* **64**: 190 (Oct.) 1938.

32. Protective Effects of CaCl_2 Against Procaine Convulsions in Guinea Pigs, R. Beutner and G. P. Miley: *Proc. Soc. Exper. Biol. & Med.* **38**: 279 (March) 1938.

33. A Further Evaluation of Artificial Pneumothorax in Lobar Pneumonia, Francis G. Blake: *J. A. M. A.* **111**: 581 (Aug. 13) 1938.

34. The Effectiveness of Therapeutic Measures After Poisoning with Sublethal and Lethal Dosages of Barbitol in the Rabbit, O. W. Barlow: *J. Lab. & Clin. Med.* **23**: 601 (March) 1938.

35. The Relative Activity of Various Purified Products Obtained from American Grown Hashish, R. P. Walton, L. F. Martin and J. K. Keller: *J. Pharmacol. & Exper. Therap.* **62**: 239 (Feb.) 1938.

36. The Effect of Benzidine Sulfate on the Emptying Time of the Human Stomach, E. J. Van Lier and C. K. Sleeth: *J. Pharmacol. & Exper. Therap.* **62**: 111 (Jan.) 1938.

37. A Comparative Study of the Effects of Various Anesthetic Agents on the Emptying Time of the Stomach, C. K. Sleeth and E. J. Van Lier: *J. Pharmacol. & Exper. Therap.* **63**: 65 (May) 1938.

38. Studies on Inflammation: XIV. Isolation of the Factor Concerned with Increased Capillary Permeability in Injury, Valy Menkin: *J. Exper. Med.* **67**: 129 (Jan.) 1938.

39. Studies on Inflammation: XV. Concerning the Mechanism of Cell Migration, Valy Menkin: *J. Exper. Med.* **67**: 145 (Jan.) 1938.

40. Studies on Inflammation: XVI. On the Formation of a Chemotactic Substance by Enzymatic Action, Valy Menkin: *J. Exper. Med.* **67**: 153 (Jan.) 1938.

41. The Role of Inflammation in Immunity, Valy Menkin: *Physiol. Rev.* **18**: 366 (July) 1938.

During 1938 the following grants were issued:

Grant 337: Harold G. O. Hoek, associate professor of pharmacology, University of Nebraska College of Pharmacy, \$150, to investigate the relation of sex differences to the action of certain drugs.

Grant 338: Torald Sollmann, dean and professor of pharmacology and Materia Medica, Western Reserve University School of Medicine, and Joseph Seifter, Western Reserve University School of Medicine, \$250, to investigate the action of certain antimony and arsenic compounds.

Grant 339: Katharine Henderson, Department of Pharmacology, Western Reserve University School of Medicine, \$300, to investigate bismuth preparations.

Grant 340: A. R. McIntyre, professor of physiology and pharmacology, University of Nebraska College of Medicine, \$100, to investigate the effects of the digitaloid bodies on the metabolism of dextrose by the cardiac musculature.

Grant 341: Maurice Rosenthal, formerly instructor in pathology, Long Island College of Medicine, \$200, to investigate radium poisoning.

Grant 342: W. L. Bradford, associate professor of pediatrics, University of Rochester School of Medicine, \$300, to investigate pertussis.

Grant 343: Morton McCutcheon, associate professor of pathology, University of Pennsylvania School of Medicine, \$150, to investigate chemotaxis, especially of leukocytes.

Grant 344: John C. Krantz Jr., professor of pharmacology, University of Maryland School of Medicine, \$250, to investigate the alkyl nitrites and their use in angina pectoris.

Grant 345: M. L. Tainter, professor of pharmacology, Stanford University School of Medicine, \$250, to investigate sympathomimetic amines.

Grant 346: A. S. Marrazzi, Department of Pharmacology and Therapeutics, New York University College of Medicine, \$200, to investigate the actions of epinephrine, ephedrine and other members of the sympathomimetic group on sympathetic ganglia.

Grant 347: Reinhard Beutner, professor of pharmacology Hahnemann Medical College, \$80, to investigate the toxicity and detoxification of procaine.

Grant 348: G. O. Brown, professor of internal medicine, St. Louis University School of Medicine, \$250, to investigate the prevention and treatment of atherosclerosis.

- Grant 149 Garnett Cheney, associate clinical professor of medicine, Stanford University School of Medicine, \$250, to investigate vitamin K deficiency in chick hemophilus
- Grant 150 James T. Culbertson, assistant professor of bacteriology, Columbia University College of Physicians and Surgeons, \$300, to investigate sulfanilamide
- Grant 151 Eugene B. Ferris, assistant professor of medicine, University of Cincinnati College of Medicine, \$200, to investigate the administration of human serum
- Grant 152 Harold D. Green, assistant professor of physiology, Western Reserve University School of Medicine, \$250, to investigate the effects of drugs on coronary vessels
- Grant 153 W. F. Hamilton, professor pharmacology and physiology, University of Georgia School of Medicine, \$125, to investigate vasomotor response of unanesthetized animals
- Grant 154 Iffebbel Hoff, assistant professor of physiology, Alexander Winkler, instructor in medicine, and Paul K. Smith, instructor in pharmacology and toxicology, University of Georgia School of Medicine, \$150, to investigate the effect of calcium, magnesium and potassium on the dog heart
- Grant 155 Peter K. Knoefel, associate professor of pharmacology, University of Cincinnati School of Medicine, \$150 to investigate the action of amines, of the epinephrine series and of related substances on the central nervous system
- Grant 156 John B. Irwin, research associate in medicine, University of California Medical School \$150, to investigate the potassium and sodium ions in the blood of asthmatic patients and in anxiety states
- Grant 157 William R. Lyons, assistant professor of anatomy, University of California Medical School, \$250 the standardization of lactogenic hormone
- Grant 158 R. J. Mann, associate professor of physiology and pharmacology, Medical College of Virginia, \$100, to investigate the effects of epinephrine and benzadrine on alveolar carbon dioxide in man
- Grant 159 F. C. McLean, professor of pathology and physiology, University of Chicago \$125 to investigate the effects of the growth hormone of the anterior pituitary lobe on the growth of long bones
- Grant 160 F. C. McLean, professor of pathology and physiology, University of Chicago, \$125, to investigate the mode of action of dihydrocholesterol (A. T. 10)
- Grant 161 S. Morgulis, professor of biochemistry, University of Nebraska College of Medicine, \$100, to investigate the relationship between muscular dystrophy and gonadal atrophy
- Grant 162 James M. Orten, assistant professor of physiologic chemistry, Wayne University College of Medicine, \$150, to investigate the effect of copper and certain other inorganic salts on the hypoglycemic activity of insulin
- Grant 163 Louis A. Toth, Department of Physiology, Tulane University of Louisiana School of Medicine, \$160, to investigate the influence of low oxygen on urine secretion
- Grant 164 Arnold De M. Welch, Department of Pharmacology, Washington University School of Medicine \$300, to investigate the lipotropic action of choline chloride
- Grant 165 Harold W. Werner, assistant professor of physiology and pharmacology, University of North Dakota Medical School \$250 to investigate the effects of stimulants on rabbits depressed with ethyl alcohol
- Grant 166 George W. Paff, Department of Anatomy, Long Island College of Medicine, \$75, to investigate the effect of digitalis on the heart
- Grant 167 Simon Benson, dean of pharmacy, Ferris Institute, \$100 to investigate the therapeutic effects of skin counterirritants
- Grant 168 Abraham White, Department of Physiological Chemistry, Yale University School of Medicine, \$200, to investigate the lactogenic substance isolated in the pituitary
- Grant 169 J. M. Dille, Department of Pharmacology, University of Washington College of Pharmacy, \$100, to investigate the action of certain depressant drugs
- Grant 170 Harold G. O. Holck, associate professor of pharmacology, University of Nebraska College of Pharmacy \$250 to investigate the possible effect of aging on the strength of digitalis preparations
- Grant 171 H. N. Cole, clinical professor of dermatology and syphilology, Western Reserve University School of Medicine \$75, to investigate arsenphenamine dermatitis
- Grant 172 Charles Weiss, associate professor of research medicine, University of California Medical School, \$200, to investigate the immunology of staphylococci infections
- Grant 173 Morris Rosenfeld, associate in pharmacology and experimental therapeutics, Johns Hopkins University School of Medicine, \$400, to investigate the hormone of the posterior pituitary gland (an ultra centrifugal study)
- The following grants were issued before Jan 1, 1938 In some cases the grant has expired and an unexpended balance remains or the work is not yet completed or not yet published
- Grant 102 C. W. Greene, professor of physiology and pharmacology, University of Missouri School of Medicine, \$250, to investigate the distribution of nitrous oxide and oxygen in the blood during anesthesia
- Grant 119 Nicholas Kopeloff, research associate in bacteriology, New York State Psychiatric Institute and Hospital, \$100, to investigate bacillus radiophilus milk for the prevention and treatment of summer diarrhea in babies
- Grant 164 E. L. Jackson, associate professor of pharmacology, Emory University School of Medicine, \$200, to investigate the antagonism between sodium barbital and insulin
- Grant 201 George R. Cowgill, associate professor of physiologic chemistry, Yale University, Sterling Hall of Medicine, \$250, to investigate vitamin B in relation to morphine addiction
- Grant 221 John G. Reinhold, Department of Public Health, Philadelphia General Hospital, \$250, to investigate the action of aminoacetic acid (glycine) in progressive muscular dystrophy
- Grant 222 Eugene U. Still, formerly assistant professor of physiology, University of Chicago, \$250, to investigate the changes in the metabolism of the pancreas
- Grant 223 Clinton H. Thienes, professor of pharmacology, and Lawrence E. Detrick, Department of Pharmacology, University of Southern California School of Medicine, \$200, to investigate withdrawal phenomena in morphine addicted animals
- Grant 232 George R. Cowgill, associate professor of physiologic chemistry, Yale University School of Medicine, \$250, to investigate the heart in vitamin B deficiency
- Grant 236 C. W. Greene, professor of physiology and pharmacology, University of Missouri School of Medicine, \$100, to investigate the pharmacology of the so called specific coronary dilator drugs
- Grant 238 Roy R. Kracke, professor of pathology, Emory University School of Medicine, \$250, to investigate the effect of the oxidation products of aminopyrine and related drugs on the leukocyte counts of rabbits
- Grant 248 Fred C. Koch, chairman of the Department of Physiological Chemistry and Pharmacology, University of Chicago, \$250, to investigate the male sex hormone
- Grant 249 J. Percy Baumberger, associate professor of physiology, Stanford University Department of Physiology, \$200, to investigate the occurrence and oxidation reduction potential of pigments in tumor cells
- Grant 251 Bernard Fantus, professor of therapeutics, University of Illinois College of Medicine, \$100, to investigate the titration of the antitoxic value of serum of patients who have received tetanus antitoxin
- Grant 261 Robert P. Walton, professor of pharmacology, University of Mississippi School of Medicine, \$100, to investigate the absorption of drugs through the oral mucosa
- Grant 263 H. A. Shoemaker, associate professor of biochemistry and pharmacology, C. E. Clymer, professor of clinical surgery, and Henry H. Turner, University of Oklahoma School of Medicine, \$150, to investigate the blood cholesterol and iodine values in thyroid disease and their alteration by treatment
- Grant 264 Detlev W. Bronk, Johnson professor of biophysics, University of Pennsylvania School of Medicine, \$200, to investigate the action of various drugs on the autonomic centers
- Grant 270 Elaine P. Ralli, assistant professor of medicine New York University College of Medicine, \$250, to investigate the effect of carotene on the blood vitamin A
- Grant 278 William H. Lewis Jr., assistant clinical professor of medicine and Arthur C. DeGraff, professor of therapeutics, New York University College of Medicine, \$150, to investigate the function of the heart in relation to age
- Grant 279 Norman A. David, assistant professor of pharmacology, University of Cincinnati College of Medicine, \$65, to investigate the effects of carbarsone and other pentavalent arsenicals on the optic nerve
- Grant 280 John P. Peters, professor of medicine Yale University School of Medicine, \$200, to investigate by means of intravenous pyelography the state of ureters and kidneys in a large series of patients after delivery and subsidence of acute signs of toxemia
- Grant 281 O. W. Barlow, formerly assistant professor of pharmacology, Western Reserve University School of Medicine, \$125, to investigate circulatory effects of metrazol under conditions of anesthesia with ether as well as under the influence of hypnotics
- Grant 282 Arthur W. Grace, Department of Medicine, Cornell University Medical College, \$250, to investigate the effect of roentgen and Frei vaccine therapy in artificially inoculated venereal lymphogranuloma in guinea pigs
- Grant 297 Melvin Dresbach, Harvard University School of Medicine, \$250, to investigate the emetic effect of some of the digitalis bodies
- Grant 298 Kenneth W. Thompson, Department of Physiology, Yale University School of Medicine, \$200, to investigate the effects of the thyroid stimulating hormone
- Grant 302 Mary E. Collett, Flora Stone Mather College, Western Reserve University, \$200, to investigate the effect of the female sex hormone on the hot flashes and the basal metabolism of ovariectomized women
- Grant 304 Howard B. Lewis, professor of biologic chemistry, University of Michigan Medical School, \$175, to investigate selenium salts
- Grant 305 Beverly Douglas, assistant dean and associate professor of surgery, Vanderbilt University School of Medicine, \$250, to investigate the pneumatic (transparent rubber jacket) system of treating extensive wounds
- Grant 306 Edwards A. Park, professor of pediatrics, Johns Hopkins University School of Medicine, \$75 to investigate rickets in the rat and the effect of solution of parathyroid on the circulation of the bone
- Grant 307 Ephraim Shorr, assistant professor of medicine, Cornell University Medical College, \$200, to investigate methods of determining adequate dosage of corpus luteum hormone for the human being
- Grant 308 Claus W. Jungblut, professor of bacteriology, Columbia University College of Physicians and Surgeons, \$250, to investigate the relation of vitamin C to diphtheria
- Grant 311 Clarence P. Berg, assistant professor of biochemistry, State University of Iowa, \$250, to investigate amino acids
- Grant 313 Treat B. Johnson, Sterling professor of chemistry, Yale University, \$250, to investigate pyrimidines
- Grant 314 F. C. Koch, chairman Department of Physiological Chemistry and Pharmacology, University of Chicago, \$250, to investigate provitamin D
- Grant 315 Erwin E. Nelson, professor of pharmacology, Tulane University School of Medicine, \$125, to investigate some actions of the pituitary

Grant 316: Edward Van Liere, professor of physiology, West Virginia University School of Medicine, \$100, to investigate the action of various drugs on gastric motility.

Grant 319: J. P. Quigley, Department of Physiology, Western Reserve University School of Medicine, \$250, to investigate gastrointestinal motility.

Grant 324: Howard B. Lewis, professor of biologic chemistry, University of Michigan Medical School, \$200, to investigate selenium salts.

Grant 327: Eben J. Carey, dean and professor of anatomy, Marquette University School of Medicine, \$250, to investigate the pharmacologic agents that influence the histologic signs of nervous action.

Grant 328: Donald E. Gregg, assistant professor of physiology, Western Reserve University School of Medicine, \$250, to investigate the cardiac blood supply in dogs.

Grant 329: Roberta Hafkeshring, associate professor of physiology, Woman's Medical College of Pennsylvania, \$250, to investigate the effects of sodium barbital, sodium amylal and pentobarbital sodium on blood pressure, respiration and kidney function.

Grant 332: J. P. Simonds, department of pathology, Northwestern University Medical School, \$200, to investigate the selective activity of toxic substances on the kidneys.

Grant 333: Owen S. Gibbs, chief of Pharmacological Division, University of Tennessee College of Medicine, \$180, to investigate the toxicity of morphine and scopolamine on rats.

TREASURER'S REPORT

Report of the Treasurer of the American Medical Association
for the Year Ending December 31, 1938

Reserve invested as at December 31, 1937.....	\$2,340,373.00	
Bonds Purchased (Cost).....	200,812.50	
		\$2,541,185.50
Less:		
Bonds Called.....	\$ 19,575.00	
Bonds Sold.....	100,406.25	119,981.25
Invested Funds December 31, 1938.....		\$2,421,204.25
Balance for Investment December 31, 1937...\$	39,061.56	
Interest on Investments.....	87,954.48	
		\$ 127,016.04
Less:		
Transfer to General Fund.....	\$ 83,939.06	
Uninvested Funds December 31, 1938....		\$ 43,076.98
Invested and Uninvested Reserve as at December 31, 1938.....		\$2,464,281.23

DAVIS MEMORIAL FUND

Balance in Fund December 31, 1937.....	\$7,118.75
1938 Interest on Bank Balance.....	107.17
Total Fund as at December 31, 1938 on Deposit..	\$ 7,225.92

HERMAN L. KRETSCHMER, Treasurer.

AUDITOR'S REPORT

February 1, 1939.

To the Board of Trustees,

American Medical Association, Chicago, Illinois.

Dear Sirs:

In accordance with your instructions, we have made an examination of the Balance Sheet of the American Medical Association, Chicago, Illinois, as at December 31, 1938, and of the Income Account for the year 1938. In connection therewith, we examined or tested accounting records of the Association and other supporting evidence, and obtained information and explanations from officers and employees of the Association; we also made a general review of the accounting methods and of the operating and income accounts for the year, but we did not make a detailed audit of the transactions. We now submit our report on the examination, together with related statements as enumerated in the index appended hereto.

In our opinion, based on such examination, the accompanying Balance Sheet and related Income Account fairly present the position of the Association as at December 31, 1938, and the results of its operations for the year, subject to the following qualifications and observations:

(1) The inventories of materials, supplies, work in progress and publications, amounting to \$92,859.95, are stated in accordance with certificates signed by responsible officials of the Association, and have not been confirmed by us.

(2) In accordance with established practice of the Association, the accounts as stated do not include (a) unrecorded assets in respect of accrued interest on bond investments, and

membership dues unpaid; and (b) provision for accrued payroll, accrued property taxes for the year 1938, and sundry unpaid bills.

(3) Subscriptions paid in advance are stated at an estimated amount which is based on cash received in December 1938, on account of 1939 subscriptions. This procedure conforms to the method used in prior years.

(4) Advance payments on publications include an estimated amount (\$123,745.97) for prepaid subscriptions to Hygeia, and the amount (\$12,430.47) received in advance for January 1939, advertising, directory information sales and service.

(5) The buildings of the Association are carried at reproduction values as determined by an appraisal by Holabird and Root as at December 31, 1936, less depreciation accrued to the date of the Balance Sheet. The portion of the depreciation provision for the year applicable to the increase in book value which was recorded at December 31, 1936, as determined by the appraisal, has been charged against the complementary credit included in the Net Worth of the Association in that connection.

(6) No provision has been made in the accounts for possible liability in respect to Federal Social Security Taxes applicable to the period prior to April 28, 1938, amounting to approximately \$90,000.00 (including penalties and interest), which liability is contingent upon the outcome of an appeal now pending in the Bureau of Internal Revenue with regard to the status of the Association under the Federal Income Tax Act.

The Association was advised by a letter dated March 4, 1936, from the office of the Commissioner of Internal Revenue, that it was held to be exempt from Federal Income Taxes, under the provisions of Section 101(6) of the Income Tax Act which relates to organizations operated exclusively for religious, charitable, scientific, literary or educational purposes. In a published bulletin issued in January 1937, the Bureau of Internal Revenue ruled that an organization which had been held to be exempt from Federal Income Taxes, under the provisions of Section 101(6) of the Income Tax Act, is also exempt from the taxes imposed under Titles VIII and IX of the Social Security Act. On April 28, 1938, however, the previous ruling (March 4, 1936) regarding the Association's status was supplanted by an advice from the Office of the Commissioner of Internal Revenue to the effect that the basis of exemption should be Section 101(7) of the Income Tax Act, instead of Section 101(6) as previously indicated; the provisions of Section 101(7) relate to organizations classified as business leagues and the like, which are not exempt from Social Security Taxes. The Association has appealed to the Bureau of Internal Revenue for reconsideration of the later ruling (April 28, 1938) and reclassification as a scientific and educational organization.

Pursuant to the ruling of April 28, 1938, the Association was requested by the Treasury Department to file proper returns and pay the taxes required by Titles VIII and IX of the Social Security Act, for the periods from the respective effective dates thereof. The Association, however, has not acceded to this request insofar as the period prior to April 28, 1938, is concerned, but returns have been filed for the period subsequent to that date, as and when due, and the taxes reported therein have been paid under protest.

We have received a letter from Messrs. Loesch, Scofield, Loesch and Burke, attorneys for the Association, regarding litigation pending against the Association or its officers at December 31, 1938, which states that the following lawsuits alleging libel had been filed against the Association or its officers as at December 31, 1938: Dr. Jean Paul Fernel for \$1,000,000.00; Robert Wadlow by Harold F. Wadlow for \$150,000.00; Hirestra Laboratories, Inc., for \$3,000,000.00; Asa Brunson for \$250,000.00; William E. Balsinger for \$100,000.00; and John R. Brinkley for \$250,000.00. In addition to the foregoing suits, the Association is named defendant in certain actions charging conspiracy in restraint of trade. The attorneys state that in their opinion all of these suits will be defeated.

Fidelity insurance is carried against the undermentioned officers and employees, in the amounts stated:

Dr. Olin West, Secretary and General Manager.....	\$10,000.00
Dr. Herman L. Kretschmer, Treasurer.....	10,000.00
E. A. Hoffman, Cashier.....	10,000.00
J. E. Hartigan, Assistant Cashier.....	2,000.00
Sundry Employees (twelve, \$1,000.00 each).....	12,000.00
Total Fidelity Insurance.....	\$44,000.00

We have pleasure in reporting that the books are well maintained and that every facility was afforded us for the proper conduct of the examination.

Yours truly, PEAT, MARWICK, MITCHELL & Co.

INDEX TO STATEMENTS

Balance Sheet, as at December 31, 1938.....	Exhibit "A"
Income Account, for the year ended December 31, 1938.....	"B"
Journal Operating Expenses, for the year ended December 31, 1938.....	Schedule "1"
Association and Miscellaneous Expenses, for the year ended December 31, 1938.....	"2"

EXHIBIT "A"

BALANCE SHEET AS AT DECEMBER 31, 1938

ASSETS:	
Property and Equipment:	
Real Estate—Land at less than cost (see Note "1"); and Buildings at Reproduction Cost New (as appraised by Holabird and Root at December 31, 1936), less Depreciation.....	\$1,146,868.37
Equipment—at Cost, less Depreciation:	
Machinery.....	\$ 127,852.74
Type and Metal.....	16,163.69
Furniture and Equipment.....	89,882.45
Chemical Laboratory.....	8,957.77
Total Property and Equipment.....	1,389,725.02
Investments—at Cost:	
U. S. Government Securities.....	1,553,723.06
Railroad, Municipal and Public Utility Bonds.....	867,481.19
Cash held by Treasurer for Investment....	43,076.98
Cash in Bank and on Hand.....	136,503.86
Accounts Receivable:	
Advertising.....	63,861.98
Co-operative Medical Advertising Bureau.....	12,592.29
Reprints.....	3,797.27
Directory (Estimated).....	10,000.00
Miscellaneous—Deposits, Advances, etc.....	15,247.32
Note Receivable.....	100.00
Inventories of Materials, Supplies, Work in Progress and Publications.....	92,859.95
Expenditures on Publications in Progress..	43,392.23
Prepaid Expenses—Insurance, etc.....	7,321.25
Total.....	\$4,239,682.40

Note 1: Book value of Land was reduced \$40,000.00 as of December 31, 1933, by official action of Board of Trustees. This action was reported to House of Delegates.

LIABILITIES:

Accounts Payable:	
Federal Social Security Taxes (see Note "2").....	\$ 28,427.78
Co-operative Medical Advertising Bureau.....	12,092.19
Miscellaneous.....	5,084.06
Subscriptions Paid in Advance.....	45,604.03
Advance Payments on Publications.....	165,914.61
Net Worth:	
Association Reserve Fund.....	\$ 350,000.00
Building Reserve Fund.....	350,000.00
Retirement Reserve Fund.....	25,000.00
Capital Account:	
Amount thereof as at December 31, 1937.....	\$3,135,053.52
Net Loss for the year ended December 31, 1938.....	11,401.51
	\$3,123,652.01
Deduct—Amounts transferred during year to Building Reserve Fund (\$50,000.00) and Retirement Reserve Fund (\$25,000.00).....	75,000.00
Increase in book value of Buildings—per appraisal.....	124,481.59
Deduct—Depreciation applicable thereto for the years 1937 and 1938.....	6,146.28
Net Worth, December 31, 1938.....	3,891,987.32
Total.....	\$4,239,682.40

Note 2: No provision has been made in the accounts for possible liability in respect of Federal Social Security Taxes applicable to the period prior to April 28, 1938, amounting to approximately \$90,000.00 (including penalties and interest)—See comment in attached report.

EXHIBIT "B"
INCOME ACCOUNT

FOR THE YEAR ENDED DECEMBER 31, 1938

Journal:	
Gross Earnings:	
Fellowship Dues and Subscriptions.....	\$ 655,875.91
Advertising.....	875,367.43
Jobbing.....	96,731.41
Reprints.....	1,139.47
Books.....	18,915.87
Insignia.....	6,835.86
Miscellaneous Sales.....	7,786.80
Gross Earnings from Journal.....	1,662,652.75
Operating Expenses—Schedule "1".....	1,020,940.53
Net Earnings from Journal.....	641,712.22

Miscellaneous Income:

Rents.....	\$ 1,200.00	
Sundry Publications.....	4,204.29	5,404.29
Association Income:		
Income from Investments.....	86,857.26	
Miscellaneous Income.....	3,232.79	90,090.05
Gross Income.....		737,206.56
Association Expenses—Schedule "2".....	458,499.27	
Miscellaneous Expense—Schedule "2".....	290,108.80	748,608.07
Net Loss.....		\$ 11,401.51

Note: No provision has been made in the accounts for possible liability in respect of Federal Social Security Taxes applicable to the period from January 1, 1938, to April 28, 1938, amounting to approximately \$20,000.00 (including penalties and interest)—See comment in attached report.

SCHEDULE "1"

JOURNAL OPERATING EXPENSES

FOR THE YEAR ENDED DECEMBER 31, 1938

Wages and Salaries.....	\$ 486,342.28
Editorials, News and Reporting.....	12,139.56
Paper—Journal Stock.....	250,163.52
Paper—Miscellaneous.....	2,090.62
Electrotype and Engravings.....	15,033.40
Binding.....	629.86
Ink.....	9,063.19
Postage—First Class.....	38,871.82
Postage—Second Class.....	64,336.09
Journal Commissions.....	16,204.10
Collection Commissions.....	620.44
Discounts.....	30,345.89
Express and Cartage.....	5,802.48
Exchange.....	2,450.89
Office Supplies.....	2,784.43
Telephone and Telegraph.....	3,620.77
Office Jobbing.....	15,710.89
Power and Light.....	10,035.79
Factory Supplies.....	11,823.80
Repairs and Renewals—Machinery.....	5,494.48
Miscellaneous Operating Expenses.....	23,290.55
Bad Debt Losses, and Loss from Sale of Equipment, etc. (Net).....	1,775.21
Total Journal Operating Expenses, before Provision for Depreciation.....	1,008,630.06

Depreciation on Equipment (computed on diminishing Balances):

Machinery.....	\$6,729.09
Furniture and Equipment.....	4,312.29
Factory Equipment.....	418.37
Type.....	343.41
Metal.....	507.31
Total Journal Operating Expenses.....	\$1,020,940.53

SCHEDULE "2"

ASSOCIATION AND MISCELLANEOUS EXPENSES

FOR THE YEAR ENDED DECEMBER 31, 1938

Association Expenses:	
Association.....	\$114,859.42
Health Education.....	36,892.70
Pharmacy and Chemistry.....	49,331.41
Chemical Laboratory.....	24,926.43
Medical Education and Hospitals.....	77,180.76
Therapeutic Research.....	7,579.18
Legal Medicine and Legislation.....	37,670.88
Bureau of Investigation.....	12,272.06
Bureau of Medical Economics.....	35,457.50
Council on Foods.....	22,184.83
Physical Therapy.....	17,823.33
Council on Industrial Health.....	7,726.70
Bureau of Association Exhibits.....	14,122.61
Laboratory Depreciation (5% on diminishing balances).....	471.46
Total Association Expenses.....	\$458,499.27
Miscellaneous Expenses:	
Insurance and Taxes.....	\$ 28,778.38
Legal and Investigation.....	67,096.56
Building Expenses.....	32,611.64
Building Depreciation (2.5% on diminishing balances—cost basis).....	18,968.18
Fuel.....	8,361.96
Federal Social Security Taxes (see Note).....	30,784.71
Sundry Publications.....	103,507.37
Total Miscellaneous Expenses.....	\$290,108.80

Note: The above expenses do not include any provision for possible liability in respect of Federal Social Security Taxes applicable to the period from January 1, 1938, to April 28, 1938, amounting to approximately \$20,000.00 (including penalties and interest)—See comment in attached report.

REPORT OF THE JUDICIAL COUNCIL

To the Members of the House of Delegates of the American Medical Association:

With the exception of applications for Fellowship in the Association which for one reason or another require investigation by the Judicial Council, the volume of work coming before it has been less than for several years. There has been the usual number of inquiries of an ethical or constitutional nature from individuals and from county and state societies. These inquiries can in general be answered by the Secretary or the Chairman without reference to the entire Council because of official opinions or answers in preceding similar situations. However, all such replies by the Secretary or Chairman receive official approval by the Council at a subsequent meeting.

It is surprising when consideration is given to the vast number and variety of schemes for reducing sickness costs to the low-income population by periodic prepayment plans that the Council has not been asked for an opinion on the ethical features of a single plan. Whether rightly or wrongly, there has been such popularity and enthusiasm for these plans and such haste in their development that the ethical principles involved apparently have been completely ignored. The Council believes it can see a rapidly growing menace to many of the sound principles which have governed the practice of medicine by the members of this organization for many years and which have contributed in preponderant measure to the high quality of medical care which the people of this country as a whole enjoy. In this report the Council desires only to sound a warning and a caution and to call attention to the fact that the practice of medicine by the members of this organization is governed, so far as ethical considerations are concerned, by the Principles of Medical Ethics as approved and adopted by the House of Delegates, which will remain as they are until the House itself changes or eliminates them. The function of the Judicial Council is interpretation only.

But one appeal from a disciplinary action by a constituent association has been brought before the Judicial Council this past year. This appeal was heard recently. The briefs and arguments are under consideration and study by the individual members of the Council. No decision has been reached as yet.

TEACHING IN SCHOOLS OF CHIROPODY OR PODIATRY

At the last annual meeting of the House of Delegates, in San Francisco, a resolution was introduced declaring that the serving of members of the American Medical Association on the faculties of schools of chiropody is unethical. The cause of the introduction of the resolution was a statement made in the annual report of the Judicial Council for that year that "teaching in cultist schools and addressing cultist societies is even more reprehensible" than association with cultists in practice. The resolution was referred to the Judicial Council as a reference committee and on its recommendation the resolution was laid on the table. Since that meeting the Council has investigated the matter further and is of the opinion that the practice of chiropody is not a cult practice as is osteopathy, chiropractic or Christian science, which have bases of treatment not supported by scientific or demonstrated knowledge but on which bases all diseases are treated. Chiropody is rather a practice ancillary—a hand maiden—to medical practice in a limited field considered not important enough for a doctor of medicine to attend and therefore too often is neglected. General opinion seems to be that chiropody fairly well satisfies a gap in medical care that the profession has failed to fill. There are several reputable medical colleges whose faculties teach this branch of the healing art to students who later become chiropodists and the Council can see no reason to declare such teaching by members of this organization to be unethical, provided the schools in which they teach are connected with approved schools of medicine and recognized standards of premedical education are required.

DIAGNOSTIC CLINICS

The Judicial Council has been asked to give a definition of a "diagnostic clinic." The word clinic is a very popular one in medical practice today and may mean anything from one doctor practicing medicine with lay assistants to a most elaborate organization prepared to do anything of a medical nature. There are also many types of clinics the names of which

describe the type of work done in them. The Greek basis of the word "clinic" meant simply medical instruction at the bedside of patients. The term has never been copyrighted and any one may use it and put his own interpretation on its meaning. The name "clinic," because of its association with the earlier users of the term, now in the lay mind implies a very superior service by very superior individuals, which too frequently is not the case. If the American Medical Association is to define a diagnostic clinic it must be done in a way that will represent the efficiency that modern scientific progress has made possible to the doctor of medicine who has kept abreast of that progress, and the idealism or ethical principle that for hundreds of years have been our most cherished heritage as a profession. It must not be a definition which any charlatan be he medical or lay, can point to as describing himself. It must be a definition which is definite. Obviously such a definition cannot be made in a sentence and equally obvious is the fact that those most anxious to use the designation will be the least pleased with it. The Council has given careful consideration to the problem of what a real diagnostic clinic is and what it should be and has sought advice from sources held in high esteem. It submits the following as its opinion of a proper definition of a diagnostic clinic worthy of the name:

1. A diagnostic clinic is an organization of physicians whose sole work in the clinic is to make or supervise diagnostic examinations of patients referred to the clinic by doctors of medicine, or to collaborate in general diagnostic surveys.
2. The reports of the diagnostic clinic on examinations and tests are made only to the referring physician unless he requests that the case and the recommendations for treatment be discussed with the patient as part of a professional consultation at which the relationship of the result of the diagnostic studies to the general condition of the patient is open for discussion. In such case, discussion is only by a member of the staff.
3. The staff of the diagnostic clinic should include representatives from all the specialties that are of recognized diagnostic usefulness. Every clinical examination, laboratory test or x-ray procedure is made by a physician who specializes in that field or under his supervision. The clinic must be equipped to allow the various specialists to exercise fully their abilities.
4. The control of the clinic must be vested in one or more members of the professional staff. Any profits are to be apportioned only to the members of the staff actually engaged in the work of the clinic. There must be no dividends, bonuses or salaries paid any individual except for services rendered.
5. The clinic must be governed in its activities by the same ethical principles as apply to an individual member of the American Medical Association.

It is recognized that under this definition only in cities large enough to support the various specialists needed can a diagnostic clinic be established or maintained. Unless the specialists are available it is not a diagnostic clinic worthy of the name.

Respectfully submitted.

GEORGE EDWARD FOLLANSBEE, Chairman.
EDWARD R. CUNIFFE.
WALTER F. DONALDSON.
JOHN W. BURNS.
JOHN H. O'SHEA.

REPORT OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

To the Members of the House of Delegates of the American Medical Association:

1. In connection with the survey of undergraduate medical schools the following institutions have been revisited:

University of Arkansas School of Medicine
Boston University School of Medicine
Wayne University College of Medicine
Albany Medical College
Wake Forest College School of Medical Sciences
Woman's Medical College of Pennsylvania
Medical College of the State of South Carolina
McHerry Medical College
University of Tennessee College of Medicine

Reports indicating progress have been received from:

University of Maryland School of Medicine and College of Physicians and Surgeons
University of Missouri School of Medicine
University of North Carolina School of Medicine
Hahnemann Medical College and Hospital of Philadelphia
Medical College of the State of South Carolina

2. The Council's report of the survey is being prepared and will be ready for publication, it is hoped, by the end of the summer.

3. Graduate education, for purposes of study, has been considered under three categories: first, systematic courses of instruction conforming to generally accepted academic standards; second, apprenticeship courses, consisting of residencies and fellowships, and, third, extension courses, conducted either separately or jointly by universities and medical societies. A preliminary report on this phase of graduate medical education was published in August 1938. The complete report will be issued when all the states have been visited.

4. From Feb. 1, 1938, to Jan. 31, 1939, 375 hospitals were visited, as follows:

For approval of internships	207
For approval of residencies	88
For approval of both	52
For registration	28

5. The report of the Interdepartmental Committee to Coordinate Health and Welfare Activities proposed among other things a vast increase in the hospital facilities of the United States. The evidence which the committee submitted in support of its program was so untrustworthy that the Council felt compelled to prepare and circulate a pamphlet showing the exact distribution of hospital facilities in the United States.

6. The Council has also made a careful study of existing hospital facilities in a single state—Mississippi—a report of which will be presented to the House of Delegates at St. Louis.

7. In addition to the visitation of hospitals, inspections were made of technical schools as follows:

Laboratory technique	25
Physical therapy	6
Occupational therapy	1

8. The Council, during 1938, was represented at the following meetings:

- American Medical Association, San Francisco
- American Medical Association, Conference on Industrial Health, Chicago
- American Hospital Association, Dallas, Texas
- Catholic Hospital Association, Buffalo
- Association of American Medical Colleges, Syracuse, N. Y.
- American Congress of Physical Therapy, Chicago
- American Society of Pharmacology and Experimental Therapeutics, Baltimore
- American Society of Tropical Medicine, Oklahoma City
- Federation of American Societies for Experimental Biology, Baltimore
- Southern Medical Association, Oklahoma City
- History of Science Society, Chicago
- Northwest Regional Conference, Chicago
- Tri State Hospital Association, Chicago
- American Congress of Physical Therapy, Western Section, Los Angeles
- Illinois Society of Experimental Biology and Medicine, Chicago
- Minnesota Hospital Convention, St. Paul
- Michigan Hospital Association
- Postgraduate Course on Industrial Hygiene, Allegheny County Medical Society, Pittsburgh
- Multnomah County Society, Portland, Ore.
- Hospital staff meetings, twenty three
- Installation of president of Tulane University, Vanderbilt University and Tufts College

9. Exhibits were prepared for:

- World's fairs, New York and San Francisco
- San Francisco and St. Louis meetings, American Medical Association
- American Hospital Association
- Catholic Hospital Association

10. Publications:

- Hospital Number of THE JOURNAL
- State Board Number of THE JOURNAL
- Educational Number of THE JOURNAL
- Study of Hospital Facilities in the United States
- Study of Graduate Medical Education
- Approved Colleges of Arts and Sciences and Junior Colleges
- Choice of a Medical School
- Data for fifteenth edition of American Medical Directory on medical schools, special examining boards and hospitals
- Proceedings of Annual Congress
- Essentials

11. Owing to the pressure of extra work created by the National Health Conference last July and by the indictment of the Association by a grand jury of the District of Columbia, the

Council is not yet in a position to make a complete report on medical practice in hospitals in accordance with the instructions of the House of Delegates (THE JOURNAL, July 2, 1938, p. 45), but an agreement has been reached with a representative group of radiologists as to the definition of the function of the radiologist in the hospital. This definition is incorporated in the revised Essentials of a Registered Hospital, submitted herewith for approval.

12. At the Congress on Medical Education and Licensure, the registration this year was 550, indicating a larger attendance than at any time within the last ten years.

13. Through the Social Security Act, the federal government has made available several million dollars for the further training of physicians. A number of state societies have found it possible, through the cooperation of the state department of health, to direct the expenditure of this money and to strengthen their own programs of postgraduate education. In other states the health department has inaugurated independent courses with results not altogether satisfactory. The House of Delegates might well bring to the attention of each of the constituent societies of the Association the paramount importance of retaining control of this phase of professional education.

14. At the Council's meeting of Feb. 11, 1939, a committee consisting of Dr. Willard C. Rappleye, Dr. Robin C. Buerki and Dr. J. W. Bowers presented to the Council an invitation to participate in the formation of an "Advisory Council on Medical Education, Licensure and Hospitals," an organization initiated by representatives of some eight or ten associations more or less interested in the subjects named in the title. This invitation reads:

This Council is created to meet the need of a body representing the medical profession, the universities, medical schools, hospitals, licensing bodies, specialty boards, public health agencies and other national organizations in this country which deal with different phases of medical education. The Council shall serve as a clearing house for the cooperative consideration of those problems and programs of professional training with which more than one organization is concerned, and shall serve as a medium for consultation and mutual assistance in the formulation and support of adequate educational standards, and as an agency for advice and recommendations to member and other organizations dealing with medical education.

The Council, feeling itself incompetent to act on this matter without instructions from the House of Delegates, voted:

That the Council recommend to the House of Delegates that it be authorized to appoint from its body three representatives to act on this Advisory Council on Medical Education, Licensure and Hospitals without voting power.

15. The Council submits herewith for the approval of the House of Delegates:

- (a) Revised "Essentials of a Registered Hospital"
- (b) Revised "Essentials of Approved Residencies and Fellowships"
- (c) Revised "Essentials for Approved Examining Boards in Specialties"

Respectfully submitted.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS.

RAY LYMAN WILBUR, Chairman.
J. H. MUSSER.
FRED MOORE.
REGINALD FITZ.
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Essentials of a Registered Hospital

General Statement.—The American Medical Association gives recognition to hospitals by admitting to the Hospital Register those that are found to qualify according to the essentials contained in the following paragraphs:

Registration is a basic distinction between all recognized hospitals and those that are refused recognition. It is a prerequisite to the consideration of a hospital for approval for interns or for residencies in specialties.

The registration of hospitals, the approval of hospitals for interns, approval for residencies in specialties, and all other service of the Association regarding hospitals is carried on by the Council on Medical Education and Hospitals.

It is the desire of the Council to cooperate in every way for the improvement of hospital service, whereby the sick and injured may be provided with scientific and ethical medical care.

The Council does not have nor does it assume legal authority over any hospital. It recognizes clearly that the officers in charge of such institutions have the unquestioned right to conduct the hospitals in any way they may deem wise. If a hospital desires to have its name appear on the American Medical Association Hospital Register and thus have the endorsement of that Association, it should be willing to comply with the principles which the Council on Medical Education and Hospitals considers necessary.

Essentials of a Registered Hospital.—Hospitals seeking admission to the register should have the following qualifications:

1. **Organization.**—The organization should consist of a board of trustees or other supreme governing body having final authority and responsibility and an executive officer or superintendent to carry out the policies adopted by the governing body. The executive officer should be assisted by adequate competent personnel.

Regardless of the form of organization, the hospital should function primarily in the interests of the sick and injured of the community.

2. **Staff.**—This constitutes the most important essential. The staff should be organized and composed of regular physicians who are properly qualified as to training, licensure and ethical standing.

Staff membership and the use of the hospital's facilities must be limited to doctors in medicine. Where cult practitioners, osteopaths, chiropractors or other healers outside the scope of regular medicine are allowed to use the hospital's diagnostic facilities, to prescribe for or treat patients in the hospital, or to enter orders or other data on the case records, such a hospital obviously cannot be recognized or endorsed by the American Medical Association.

Regular staff conferences should be held at least monthly and preferably more often. All deaths that occur during the period intervening between meetings, perplexing cases, and patients who do not respond to treatment should be discussed. When postmortem examinations have been performed there should be a presentation of the clinical aspect of the patient and the postmortem observations. Interesting pathologic specimens from surgery or removed at postmortem should be presented and discussed with regard to the preoperative or antemortem findings.

Minutes of staff conferences should be kept and filed with the hospital records. The activity of the staff as to scientific meetings and clinical and pathologic conferences is an index to the scientific mindedness and progressiveness of the group.

3. **Nurses.**—A competent nursing staff should be provided by employing an adequate number of registered nurses who are graduates of schools of nursing recognized by the state board of nurse examiners, or by maintaining such a school.

All nursing should be supervised by qualified registered graduates.

4. **Records.**—An adequate record system should be maintained. No particular system or set of forms is recommended, since requirements are not the same under varying circumstances. The average case record should include at least a brief medical history, physical examination, laboratory reports, diagnosis, operative record, progress notes, nurses' notes and summary. Case records should be complete in every department and reviewed and signed by the attending physicians before they are placed in the permanent file. Roentgenologic interpretations, pathologic descriptions and diagnoses of tissues removed in the operating room, and (when an autopsy has been performed) a description of postmortem observations, should be included with the patient's record.

Case histories and physical examinations should be recorded in the patient's chart within twenty-four hours after the patient has been admitted to the hospital. A patient should not be operated on, except in the case of emergency, when the history, physical examination and routine laboratory work have not been completely recorded in the chart. The duty of recording these data falls on the attending physician and he should be held directly responsible for the case records.

Monthly and annual analyses of hospital service should be made in order that the staff may be in a position to improve its service.

5. **Pharmacy.**—The handling of drugs should be adequately supervised and should comply with state laws.

6. **Pathology.**—The hospital should provide or have read access to laboratory facilities in accordance with its needs. All tissues removed in the operating room should be examined, described and diagnosed by a competent pathologist except in tissues, such as tonsils and teeth, in which the pathologic change are quite obvious.

A physician-pathologist qualified by training and experience to supervise the laboratory service and interpret tissue pathology should be employed on a full time or part time basis. When this is not practicable, arrangements should be made with consulting pathologist for tissue diagnosis, postmortem work and the interpretation of the more complicated tests and determinations in clinical and surgical pathology, as well as in general clinical laboratory work. Preferably the pathologist should be a physician who holds a certificate of the American Board of Pathology.

Autopsies.—Every effort should be made to secure consent for autopsies, which should be performed by a competent pathologist.

7. **Radiology.**—The responsibility for all radiologic examinations must rest on the physician-roentgenologist who is head of the department. His findings and conclusions for all examinations should be placed in the patient's chart. Nothing in this provision should preclude additional study and interpretation by qualified attending physicians on the staff.

The physician-roentgenologist should be preferably one who is a diplomate of the American Board of Radiology or a physician whose qualifications are acceptable to the Council on Medical Education and Hospitals of the American Medical Association.

It shall not be the policy of the hospital to make a profit from the department of radiology.

8. **Ethics.**—In order that a hospital may be eligible for registration it will, of course, be expected that the staff and management conform to the principles of medical ethics of the American Medical Association with regard to advertising, commissions, division of fees, secret remedies, extravagant claims, over-commercialization and in all other respects.

Essentials of Approved Residencies and Fellowships

Residencies and fellowships in the clinical branches of medicine and surgery, pathology and radiology represent advanced training usually in preparation for the practice of a specialty. Residencies in specialties, as defined by the Council, are straight services of one or more years following an approved internship. A fellowship is a form of apprenticeship which in some cases is indistinguishable from a residency, although it usually offers greater opportunity for the study of basic sciences and research. Ordinarily a fellowship is a university rather than a hospital appointment. Mixed residencies are general hospital assignments following internship. (They include services classified as general residencies and chief residencies.)

Approved residencies and fellowships are offered in the following branches of medicine:

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|--------------------------------|----------------------------------|
| 1. Anesthesiology | 16. Ophthalmology |
| 2. Cardiology | 17. Ophthalmology-Otolaryngology |
| 3. Communicable Diseases | 18. Orthopedic Surgery |
| 4. Dermatology and Syphilology | 19. Otolaryngology |
| 5. Epilepsy | 20. Pathology |
| 6. Fractures | 21. Pediatrics |
| 7. Gynecology | 22. Physical Therapy |
| 8. Malignant Diseases | 23. Plastic Surgery |
| 9. Medicine | 24. Psychiatry |
| 10. Mental Deficiencies | 25. Radiology |
| 11. Mixed Residency | 26. Surgery |
| 12. Neurology | 27. Thoracic Surgery |
| 13. Neurosurgery | 28. Traumatic Surgery |
| 14. Obstetrics | 29. Tuberculosis |
| 15. Obstetrics-Gynecology | 30. Urology |

I. GENERAL REQUIREMENTS

Registration.—Previous admission to the Register of the American Medical Association is essential in the case of hospitals offering fellowships and residencies in specialties.

This implies that each hospital must be adequately organized, staffed and equipped and that it be conducted primarily for the welfare of the sick. The educational function described in these Essentials is supplementary to the main purpose of the hospital service but is closely related thereto in that it serves to improve the quality of medical practice.

Size.—The size of the institution is not a primary consideration. The clinical material, however, should be sufficient to enable residents and fellows to observe the principal manifestations of the disease, or diseases, they are studying.

Plant and Equipment.—The physical plant should be such as to assure the safety and comfort of the patients. There should be such equipment, appliances and apparatus as are commonly employed in the specialty in which training is offered and in the use of which the resident should become proficient.

II. STAFF

There must be an organized staff of ethical, licensed physicians holding the degree of doctor of medicine from acceptable medical schools. The particular specialties in which residents are being trained must be represented on the staff by well qualified, experienced and proficient physicians.

In general hospitals, the staff shall further provide a definite departmental organization in those branches of medicine in which residencies are offered. The director of each service should be a competent specialist who is at least eligible for certification by the corresponding specialty board. He should assume direct responsibility for the training of residents and fellows and should stimulate others of his staff to give instruction and sympathetic cooperation which graduate students require.

It is essential that there shall be at least monthly clinical-pathologic conferences or other regular staff meetings at which histories and clinical observations in selected cases may be reviewed, particularly when the death of patients has necessitated special study including necropsy performance. In addition to meetings of the staff as a whole, it is expected that departmental conferences shall be conducted in which residents may take an active part to the end that the character of the service given by that department to its patients may be recurrently evaluated. Other educational activities requiring the full support of the staff are described under Training Program, section IX.

III. DEPARTMENT OF RADIOLOGY

The department of radiology shall be under the direction of a qualified radiologist proficient in the various functions of his specialty. He must likewise cooperate in all matters pertaining to residencies and fellowships which fall within the scope of his service. The department should contain roentgenographic, roentgenoscopic and, where required, therapeutic equipment and radium. All these facilities are essential in institutions offering a complete residency or fellowship program in radiology.

After Jan. 1, 1942, an applicant for certification by the American Board must have completed a period of study after the internship of at least three years in a recognized institution or radiologic department. This period of specialized training should include an active experience in radiology of not less than twenty-four months and graduate instruction in pathologic anatomy, radiophysics and radiobiology. Board certificates are offered in (1) the entire field of radiology, (2) roentgenology, (3) diagnostic roentgenology and (4) therapeutic radiology.

Residencies and fellowships of from one to three years' duration should be organized in such a manner that on completion of the graduate program the aggregate of training will coincide with the foregoing requirements. Courses of shorter duration, however, may provide the basic instruction in radiology required by other specialties. A complete residency or fellowship program supplies training in all divisions of the specialty—diagnostic roentgenology, therapeutic roentgenology and radium therapy. Without attempting to define a detailed plan of instruction it can be suggested that the first year be devoted principally to pathology, roentgenologic technic and a general orientation in the radiologic field. In the second and third years

the clinical applications of radiology should be emphasized with at least six months assigned exclusively to radiotherapy. In view of the importance of pathology as a basis for radiologic diagnosis and therapy it is recommended that a minimum of six months be devoted to pathologic anatomy, particularly the study of gross pathology and tumors. Instruction in radiophysics and radiobiology may well run concurrently with the training in radium therapy and therapeutic roentgenology.

Residencies in a restricted field of radiology can likewise be modeled on this plan. The training should be systematic and progressive in character with gradual assignment of responsibility in both diagnosis and therapy. It should also include an active participation in radiologic conferences, staff meetings, and joint conferences with other departments. An adequate amount of clinical material must be available in the divisions of radiology in which residency or fellowship training is offered.

IV. DEPARTMENT OF PATHOLOGY

The department of pathology must be under the supervision of a qualified pathologist who shall be prepared to cooperate fully in the training of graduate students and supervise any direct contact which they have with the laboratory. The department should provide apparatus, reagents and materials necessary to the operation of a modern clinical and pathologic laboratory. Adequate necropsy facilities should also be available.

Residencies and fellowships, in contrast to the shorter courses for basic instruction in pathology, are ordinarily of from one to three years' duration. Thus they may serve to fulfil the requirements for certification, which specify in addition to the internship a period of study of at least three calendar years, including one year in the various phases of clinical pathology and not less than two years of training and experience in a department of pathologic anatomy. (The training may be combined or in sequence.)

The teaching material must be sufficient in kind and amount to afford graduate students adequate training in all divisions of the service and in both gross and microscopic pathology. Systematic instruction should be carried out with the use of fresh material and collections of slides and museum specimens for comparative studies in histology and pathology. As the training continues an increasing amount of responsibility should be assigned to the residents and fellows in tissue diagnosis, in actual performance of postmortem examinations and in the preparation of pathologic reports and necropsy protocols. Further instruction should be obtained through active participation in clinical-pathologic conferences, staff meetings and joint conferences with other departments.

V. NECROPSIES

Thoroughness in postmortem performance should be emphasized. All institutions and individual clinical services desiring approval for the training of residents or fellows must examine post mortem 15 per cent or more of their fatal cases. An additional requirement of at least 100 necropsies a year applies to institutions offering residencies or fellowships in pathology. Complete necropsy records should be kept on file and each should contain a summary of the clinical record and a detailed description of both the gross and the microscopic observations. Graduate students of all departments should attend postmortem examinations as often as possible. They may, with value, participate in the performance of necropsies from their own service and in the preparation of the protocols.

VI. MEDICAL LIBRARY

Institutions offering graduate training should maintain or provide ready access to an adequate medical library containing modern texts, the *QUARTERLY CUMULATIVE INDEX MEDICUS* and current journals relating to the fields in which residencies and fellowships are offered.

VII. HISTORIES AND RECORDS

There must be complete histories giving the patient's complaint, physical examination at time of admission, preliminary diagnosis, laboratory observations, descriptions of operations if any, regular progress notes, final diagnosis, condition on discharge, end results and, in case of death, necropsy observations if postmortem examination is performed.

The histories should show by signatures, or initials, all persons writing them or parts of them as well as the staff members by whom the histories are verified. Likewise, all orders and progress notes should be initialed or signed.

The records should be in charge of some competent person, preferably a trained record librarian. Alphabetical and diagnostic indexes of the patients should be maintained and the records filed so as to be readily accessible from either source. Operative procedures and radiologic and pathologic material should likewise be classified in a suitable manner.

VIII. ELIGIBILITY OF APPLICANTS

Candidates for residencies or fellowships should be selected from graduates of approved medical schools, who have served an internship in an approved hospital or have had two or more years in practice. It is recommended, however, that candidates seeking residencies or fellowships in such specialties as urology, orthopedics, plastic surgery, thoracic surgery and neurosurgery should have completed one year of general surgical training in addition to the internship.

IX. TRAINING PROGRAM

Residencies and fellowships are designed primarily to meet the requirements for certification of special practice. Individually they may not fulfil all the essentials of a specialty board, but each service that is properly organized will make a substantial contribution to the graduate program. In all instances the term of service should be at least twelve months and might well be extended to two or more years when suitable facilities are available. An affiliation with a university or medical school is desirable to provide the required training in basic sciences relating to individual specialties.

Aside from the daily contact with patients and staff men, the assumption of responsibility is the most valuable aspect of residency and fellowship training. Consequently, as ability is demonstrated, an increasing amount of reliance should be placed in the judgment of graduate students both in diagnosis and in treatment.

Residents and fellows should be given an opportunity to contribute to the effectiveness of the hospital service by some investigative work. This may take the form of research in the hospital laboratories or wards, summaries of medical literature, or the preparation of statistical analyses derived from the hospital record department. The members of the resident staff should likewise be encouraged to engage in teaching activities, particularly in relation to the training of medical students, interns and nurses.

The effectiveness of a residency or fellowship program depends largely on the quality of medical supervision and teaching. It is important, therefore, that methods of instruction be employed which are best suited to the special field. Emphasis should be placed on bedside instruction, teaching rounds, departmental meetings or seminars, clinical-pathologic conferences, demonstrations and lectures. The review of medical literature is an essential feature of residency training. Likewise the study of basic sciences as required by specialty boards should be integrated with the clinical experience. In the operative divisions it is desirable that facilities be available for anatomic dissection and experimental surgery on animals or on the cadaver. Additional requirements apply to graduate courses leading to advanced degrees.

The following regulations pertaining to individual specialties contain a brief abstract of the special training required for certification by the Specialty Boards. The full requirements for certification should be ascertained by direct correspondence with the secretary of each board as listed in section XI.

1. **ANESTHESIOLOGY.**—Present requirements for certification by the American Board include an internship of one year and at least four calendar years of active experience limited to anesthesiology. This period of specialized training and practice should include a minimum of two years of supervised clinical instruction in anesthesiology and graduate study in the related basic sciences, particularly anatomy, physiology, pharmacology and biochemistry. After Jan. 1, 1942, the requirements will be interpreted as three years of special training and three years of additional practice in anesthesiology.

The director of the department should be a qualified physician limiting his practice to anesthesiology. It is preferable that he serve on a full time basis to supervise the technical and educational activities of the department. His staff must include an adequate number of trained anesthetists in accordance with the needs of the service.

Equipment must be satisfactory for the teaching of modern methods of anesthesia and should include suitable apparatus for gas administration, resuscitation and inhalation therapy. Likewise, the clinical material must be sufficient to afford graduate students adequate experience in the various methods and types of anesthesia now commonly employed. It is expected that each graduate student should administer a minimum of 500 anesthetics a year, of which 400 should be general surgical in type. Residencies and fellowships organized in accordance with the foregoing requirements should provide systematic clinical and technical instruction supplemented by seminars, lectures and demonstrations on anatomic and other material.

2. **CARDIOLOGY.**—(See Medicine.)

3. **COMMUNICABLE DISEASES.**—(See Medicine.)

4. **DERMATOLOGY AND SYPHILOLOGY.**—In order to qualify for certification in dermatology and syphilology, graduate students who begin their training after Jan. 1, 1940, must complete three years of systematic instruction and two additional years of study or practice. The period of specialized training following internship shall include (a) not less than eighteen months of active experience in clinical dermatology and syphilology and (b) graduate study in the basic sciences of embryology, histology, chemistry, physiology, bacteriology, mycology, parasitology, pathology, immunology, serology, pharmacology and physics as related to physical therapy.

Residencies and fellowships designed to meet these requirements should provide an organized course of instruction involving lectures, seminars, clinical demonstrations and laboratory assignments especially in histopathology, parasitology, mycology and immunology. To facilitate clinical and laboratory teaching it is essential that the department have ready access to an adequate supply of classified anatomic and pathologic material including histologic and lantern slides for demonstrations. Projection apparatus should be available and also facilities for clinical photography.

Since the practice of dermatology and syphilology is concerned largely with ambulatory patients, it is essential that an active outpatient service be available to furnish sufficient clinical material in the various subdivisions of the specialty. It is also desirable that hospital facilities be available and that graduate students be given an opportunity to observe the dermatologic manifestations of the acute contagious diseases. Ordinarily a minimum of 3,500 annual visits is considered essential in the dermatologic division and a similar number in syphilology.

5. **EPILEPSY.**—(See Psychiatry and Neurology.)

6. **FRACTURES.**—(See Surgery; also Orthopedics.)

7. **GYNECOLOGY.**—(See Obstetrics and Gynecology.)

8. **MALIGNANT DISEASES.**—The division of malignant diseases is largely a combination of services involving practically all the branches of medicine and surgery, including pathology and radiology. It is important, therefore, that competent staff physicians be assigned to all departments and that special facilities be available for histopathology, diagnostic roentgenology, operative surgery, therapeutic roentgenology and radium therapy.

The clinical material should be sufficient in kind and amount to enable graduate students to observe and study the various types of malignant diseases and the methods of therapy commonly employed. A teaching service should have approximately 350 inpatients a year and additional material in the outpatient tumor clinic.

Ordinarily, the training is general in type with assignments in clinical diagnosis, pathology, diagnostic roentgenology, surgery, therapeutic roentgenology and radium therapy. Courses in surgical and postmortem pathology, radiophysics and radiobiology are often included. In some instances the service is limited in scope and is utilized primarily as supplementary training in internal medicine, surgery, pathology, radiology or other specialties.

9. **MEDICINE.**—Requirements for certification in this specialty include an approved internship of at least twelve months, three years of special training and two additional years of practice in the field of internal medicine or its more restricted and specialized branches. The graduate training should include several months of properly supervised instruction in anatomy, physiology, biochemistry, pathology, bacteriology or pharmacology as related to medical specialties.

Residencies and fellowships should necessarily be organized on a broad basis to furnish instruction in the various specialties which combine to form the foundation of practice in internal medicine. Accordingly, the service should not be limited entirely to general medicine and its subdivisions of allergy, cardiology, gastro-enterology, metabolic diseases, contagion and tuberculosis but might well include a reasonable amount of instruction in the divisions of psychiatry and neurology, dermatology and syphilology, and pediatrics, now organized as independent specialties.

It should be taken into account, however, that not more than one year of instruction in the related medical specialties and basic sciences can be applied to the three year period of special training.

In institutions offering residencies and fellowships in general medicine, cardiology, communicable diseases or tuberculosis, emphasis should be placed on the educational features of the service and residents should receive regular instruction from members of the staff in methods of clinical study and diagnostic and therapeutic procedures. Of particular importance is the study of etiology, pathogenesis, symptomatology and course of the various diseases so that the residents may develop skill and accuracy in diagnosis as well as a mature judgment and resourcefulness in therapy.

Under the supervision of qualified members of the staff the residents should assume individual responsibility in actual case management. They should also be required to correlate clinical studies with postmortem pathology, review medical literature and take an active part in weekly teaching rounds, departmental seminars and clinical-pathologic conferences. Instruction in the basic sciences may well be integrated with the clinical experience.

Training in tuberculosis should be of such a character that residents may become thoroughly familiar with the various phases of institutional service as well as the community aspects of tuberculosis control. This necessitates a well organized program of instruction with rotating assignments in the admitting department, infirmaries, convalescent and ambulatory wards and the outpatient clinics. Careful instruction should be provided in diagnosis, interpretation of roentgenograms, therapeutic procedures and general sanatorium care. It is particularly important that the residents become fully acquainted with the use of pneumothorax therapy and the technic of the initial induction as well as the subsequent refills. If a surgical department is maintained, the operative service may be combined with the general training in tuberculosis or it may form the basis of a separate residency in thoracic surgery.

It must be emphasized that residencies in tuberculosis are educational in character and that of the full time sanatorium staff only those physicians who serve primarily on an educational basis come within the residency classification of the Council.

The clinical material must be adequate in kind and amount. In general medicine a minimum of 400 annual admissions is considered desirable, while in tuberculosis approximately 125 inpatients a year may be sufficient.

Residencies in cardiology and communicable diseases may well follow the general plan indicated. In cardiology a large part of the required teaching material is frequently supplied on a consultation basis and therefore the number of patients admitted directly to the department may not be an accurate index of the scope of the service. A well balanced service is essential for residency training in contagious diseases. Between 300 and 400 admissions a year may be considered sufficient, especially if most of the acute contagious diseases are well represented.

10. **MENTAL DEFICIENCIES.**—(See Psychiatry and Neurology.)

11. **MIXED RESIDENCY** (see definition in opening paragraph).—All hospitals approved for intern training are automatically accredited for mixed residencies which represent general assign-

ments of at least one year duration following an approved internship. Other hospitals presenting a general service and an admission rate of at least 1,500 patients a year may likewise be certified if they conform to the general requirements for residency training.

12. **NEUROLOGY.**—(See Psychiatry and Neurology.)

13. **NEUROSURGERY.**—(See Surgery; also Psychiatry and Neurology.)

14. **OBSTETRICS.**—(See Obstetrics and Gynecology.)

15. **OBSTETRICS AND GYNECOLOGY.**—Candidates for certification in obstetrics and/or gynecology must in addition to other requirements have completed a year of internship and five years of practice including at least three years of special training in obstetrics and/or gynecology. After Jan. 1, 1942, the requirements for all candidates will consist of one year of approved internship followed by a minimum of seven years of practice including not less than three years of special training in obstetrics and/or gynecology.

Institutions offering residencies or fellowships in obstetrics and/or gynecology must provide surgical and obstetric facilities adequate for the clinical and teaching needs of the service. They should also furnish sufficient teaching material to afford graduate students a wide experience in clinical diagnosis, treatment, and technical and operative procedures. Ordinarily an admission rate of 400 patients a year is considered necessary for graduate training in obstetrics and a similar requirement applies to gynecology. In a combined service each division should furnish a corresponding amount of clinical material. Antepartum and follow-up clinics are also essential.

The graduate program should include the study of fundamental subjects, particularly obstetric and gynecologic pathology, anatomy, embryology and physiology. Primarily, however, the emphasis should be placed on clinical training in order that graduate students may receive ample instruction in the various phases of gynecologic and obstetric service—antepartum care, treatment of toxemias of pregnancy, management of normal and abnormal labor, technic of versions, breech extractions and instrumental delivery; diagnosis and treatment of the complications of labor, postpartum hemorrhage, puerperal infections; operative obstetrics and gynecology. Courses of instruction should include assignments in pathology, demonstrations on the manikin, departmental seminars, clinical-pathologic conferences, and teaching rounds. Training in surgical technic should be sufficient to enable residents and fellows to undertake operative work on their own responsibility especially toward the end of the graduate program.

16. **OPHTHALMOLOGY.**—To become certified in ophthalmology a candidate must have completed an internship of one year or its equivalent and a period of combined study, training and practice of not less than three years. The special training should include active clinical experience and graduate study of related basic sciences, particularly anatomy, histology, embryology, optics, physiologic optics, visual physiology and psychology, pathology, bacteriology and pharmacology. The candidate should have knowledge of the application of these subjects and their use in clinical ophthalmology especially in refraction, disorders of motility and binocular vision, perimetry, and in the use of the ophthalmoscope, retinoscope and slit lamp.

Residencies and fellowships should be organized in such a manner that on completion of the graduate program the aggregate of training should coincide with the foregoing requirements. There must be adequate equipment for diagnosis, therapy, refraction, operative procedures, and preferably additional facilities for dissection and experimental surgery. Histologic and pathologic material should be available for demonstration and individual study. The clinical facilities must be sufficient in kind and amount to afford graduate students an adequate experience in diagnosis, therapy and operative technic. Ordinarily a minimum of 150 admissions and 1,500 outpatient visits a year is considered necessary for graduate training in this specialty.

A systematic course of instruction should be offered with regular lectures and demonstrations in clinical and operative ophthalmology. Instruction in surgical technic should be sufficient to enable residents and fellows to undertake operative

work on their own responsibility, especially toward the end of the graduate program.

17. **OPHTHALMOLOGY-OTOLARYNGOLOGY.**—A joint service in ophthalmology and otolaryngology should fulfil the requirements listed under each department except that three years of training and experience should constitute the minimum time required.

18. **ORTHOPEDIC SURGERY.**—After Jan. 1, 1940, candidates for certification must have completed one year of internship, three years of concentrated instruction in orthopedic surgery and two years of subsequent practice in this special field. Knowledge of the basic sciences related to orthopedic surgery is also required.

As preliminary training the Council recommends one year of general surgery in addition to the internship. Surgical and orthopedic facilities must be satisfactory and clinical material sufficient to afford graduate students adequate experience in the correction of congenital and acquired deformities and in the treatment of fractures and other acute and chronic disorders which interfere with the proper function of the skeletal system and its associated structures.

Both hospital and outpatient facilities are desirable, and institutions offering graduate instruction should treat a minimum of 200 inpatients annually. Students should become thoroughly familiar with all methods of diagnosis and treatment, corrective exercises, physical therapy, operative procedures and the use of orthopedic appliances. Instruction in surgical technic should be sufficient to enable residents and fellows to undertake operative work on their own responsibility, especially toward the end of the graduate program.

Graduate study is recommended in the fundamental sciences of anatomy, embryology, physiology, pathology, bacteriology and biochemistry. Clinical instruction should include teaching rounds and departmental conferences.

19. **OTOLARYNGOLOGY.**—The qualifications for special practice in this field include an approved internship and three years of graduate preparation, with at least one and preferably two years in recognized residencies or basic courses followed by private practice in otolaryngology.

Residencies and fellowships in otolaryngology should aim to provide adequate clinical and operative experience and additional opportunities, if possible, for graduate study in the related basic sciences of anatomy, embryology, histology, physiology, pathology, bacteriology and pharmacology.

Essential equipment for diagnosis and surgery should be available, including an audiometer and other special apparatus depending on the scope of the service. The department should further provide histologic and pathologic material for demonstrations and study and preferably facilities for experimental surgery and dissection of the head and neck. The clinical material should be sufficient in variety and amount to provide adequate training in the various divisions of the service, which might advantageously include the field of bronchoscopy. It is generally assumed that a graduate service would require a minimum of 400 admissions a year and at least 3,500 visits in the outpatient department.

The training should include a systematic course of instruction with lectures and demonstrations on clinical and technical subjects pertaining to the various phases of otolaryngology. Instruction in surgical technic should be sufficient to enable residents and fellows to undertake operative work on their own responsibility, especially toward the end of the graduate program.

20. **PATHOLOGY.**—(See Department of Pathology, section IV.)

21. **PEDIATRICS.**—To qualify for certification in pediatrics a candidate must have completed five years of training and practice after graduation from an approved medical school. The requirements include an approved internship of one year, a service of two years in a pediatric center and two additional years of specialized study or practice. Although the training need not be continuous or in the same institution, it is desirable that the educational program be systematized in the form of residencies or fellowships of from one to three years' duration.

Clinical training should be obtained in general medical pediatrics, nutritional disorders, care of newborn infants, preventive pediatrics and outpatient clinics in the various departments of medical pediatrics. Correlative studies are recommended especially in contagion, well baby clinics, mental deficiencies,

neurologic disorders of children and behavior problems. Sufficient time should also be devoted to the fundamental subjects of physiology, embryology, nutrition, growth and development.

In the wards and in the clinics the residents and fellows should be permitted to assume individual responsibility in diagnostic and therapeutic procedures and case management. They should actively participate in teaching rounds, clinical-pathologic conferences, departmental seminars and all other functions designed to improve the quality of the clinical and educational service. To supply an adequate amount and variety of teaching material a department should provide a minimum of approximately 200 annual admissions in general medical pediatrics.

22. **PHYSICAL THERAPY.**—The department should be under the direction of a physician qualified by training and experience in physical therapy. He should spend sufficient time in the department daily to supervise actually the work of the graduate students and technicians. Adequate space and apparatus should be furnished in the department for all phases of the work. The clinical material should be sufficient in kind and amount to enable the residents and fellows to observe and study all forms of treatment in physical therapy. Both inpatient and outpatient clinical material should be available.

The training should include (a) the study of certain fundamental subjects: physics of light, heat, electricity and mechanics; anatomy, with special reference to the peripheral nervous system, muscles, blood vessels, bones and joints; physical chemistry as related to physical therapy; physiology; (b) clinical and hospital training in the study and treatment of patients by various physical agents—light therapy, thermotherapy, fever therapy, hydrotherapy, electrotherapy and mechanotherapy. Emphasis should be placed on subjects related to physical therapy such as orthopedics, neurology, roentgenology, dermatology and general medicine.

A minimum of three years of special training is considered necessary for a physician to qualify as a specialist in physical therapy.

23. **PLASTIC SURGERY.**—(See Surgery.)

24. **PSYCHIATRY AND NEUROLOGY.**—Specialized training and experience of at least five years is essential for certification in neurology or in psychiatry. (To qualify in both fields a minimum of six years is required.) The requisite training consists of three full years of study after the general internship, and two or three additional years of practice or study in psychiatry or neurology or both. During the period of training a program of graduate studies should run concurrently with clinical instruction, covering the fundamentals of neuro-anatomy, neuropathology, neurophysiology, psychobiology and psychopathology.

In institutions offering residencies and fellowships of from one to three years' duration, emphasis should be placed on the educational features of the service, and the residents should receive regular instruction from members of the staff in general orientation in the specialty, and diagnostic and therapeutic procedures and methods of clinical study as well as in the organization of ward services. Administrative details, progress notes, and contact with patients' relatives should be kept sufficiently within bounds so that the residents may employ their time in the study and treatment of neurologic and psychiatric disorders. Emphasis should be placed on the study of etiology, pathogenesis, symptomatology and course of the various diseases so that the residents may develop skill and accuracy in diagnosis, as well as mature judgment based on knowledge of the natural history of the diseases and resourcefulness in therapy.

A rotating assignment in psychiatry is essential to give residents adequate experience on the admission services, on the infirmaries and wards, in the therapeutic divisions and in the outpatient clinics. A resident in neurology should have adequate contacts with psychopathic departments, general medicine, pediatrics, contagious disease and tuberculosis services so that he may become familiar with neurologic complications of general diseases, and he should also witness or assist at whatever neurosurgical operations are performed in the hospital. Teaching rounds, clinical and pathologic conferences and seminars are essential for clinical instruction in both fields.

The clinical material must be adequate in kind and amount. Between 200 and 400 admissions a year per resident is considered desirable. Smaller numbers prevent proper survey of the field of neuropsychiatric disorders; larger numbers are incompatible with adequate study of the patients admitted. Similar requirements apply in institutions where separate residencies are offered in the field of epilepsy and mental deficiencies, except that not more than one year of residency in either type of hospital will be considered as preparation for the specialty of psychiatry or neurology. It must be emphasized that residencies in psychiatric and neurologic hospitals are educational in character and that, of the full time psychiatric or neurologic staff of such hospitals, only those physicians who serve primarily on an educational basis come within the residency classification of the Council.

25. RADIOLOGY.—(See Department of Radiology, section III.)

26. SURGERY.—The requirements for certification by the American Board of Surgery include an approved internship and at least five additional years of special training in surgery. During this period the entire time should be devoted to surgical training supplemented by sufficient experience in the basic sciences of anatomy, physiology, pathology, bacteriology and biochemistry.

Residencies and fellowships, organized in accordance with these requirements may be of from one to five years' duration but need not necessarily be confined to one institution. In aggregate, however, the training should coincide with the plan described. Individual residencies may be conducted in general surgery, fractures, neurosurgery, plastic surgery, thoracic surgery, traumatic surgery and other surgical divisions now organized as independent specialties. As preliminary training for residencies and fellowships in such specialties as neurosurgery, orthopedics, plastic surgery, thoracic surgery and urology the Council recommends one year of general surgery in addition to the internship.

All surgical departments can readily subscribe to the same general plan of training, although their scope of service may show considerable variation. Training in most of the surgical specialties is ordinarily limited to one division, but residencies in general surgery may well encompass the entire surgical field with the possible exception of ophthalmology and otolaryngology.

It is essential that adequate supervision be maintained by a competent department head responsible for the organization of the graduate program. He should personally direct the plan of clinical and operative training but may well rely on qualified assistants to supervise certain details of the educational service. Residencies and fellowships should emphasize careful training in diagnosis, preoperative therapy and post-operative care. This requires systematic bedside instruction, correlation of clinical and operative data, the study of gross and microscopic pathology, collateral reading, and accurate observations throughout the entire course of the disease. Supplementary instruction should be furnished in the form of departmental seminars, teaching rounds and clinical-pathologic conferences, usually on a weekly basis. It is also desirable that facilities be available for anatomic dissection and experimental surgery on animals or on the cadaver. Surgical training should be obtained under the careful guidance and supervision of competent specialists. It should be sufficient in amount to insure a reasonable degree of technical proficiency and thus enable the residents and fellows to undertake operative work on their own responsibility, especially toward the end of the graduate program.

Equipment and facilities for general and special surgery must be adequate to meet the needs of the service. The clinical material should likewise be sufficient to furnish adequate experience and training in diagnosis, therapy and operative technic. Accordingly it is suggested that general surgical services provide approximately 400 annual admissions per resident. The same amount may not be necessary for separate residencies in fractures, neurosurgery, plastic surgery, thoracic surgery and traumatic surgery, but even in the most limited of these specialties there should be at least 150 patients treated annually.

27. THORACIC SURGERY.—(See Surgery; also Tuberculosis.)

28. TRAUMATIC SURGERY.—(See Surgery.)

29. TUBERCULOSIS.—(See Medicine.)

30. UROLOGY.—For certification in urology a minimum of five years of special training and practice is required after the internship. This period of preparation should include an active clinical experience of at least eighteen months, graduate training in anatomy, physiology, pathology and other basic sciences, and not less than two years of additional practice.

As preliminary training for residencies and fellowships in urology, the Council recommends one year of general surgery in addition to the internship. Graduate instruction should be organized in accordance with the aforementioned requirements. It should be systematic and progressive in character to the end that adequate training may be obtained in diagnosis, therapy, cystoscopic examinations, pyelography and operative procedures, all under the supervision of a well qualified urologist.

Instruction in the fundamental branches can readily be integrated with the clinical experience. Particular emphasis should be placed on the study of pathology, and residents and fellows might well be required to examine both grossly and microscopically all urologic specimens removed during their term of service. Teaching rounds and departmental conferences are considered essential for systematic clinical instruction.

The department must provide adequate facilities for surgery and special urologic procedures.

Training in surgical technic should be sufficient to enable residents and fellows to undertake operative work on their own responsibility, especially toward the end of the graduate program.

The clinical material should be sufficient in amount and variety to fulfil the teaching needs of the service. It is generally assumed that a minimum of 200 inpatients a year is necessary for advanced training in urology. This amount should be supplemented by outpatient material in cystoscopic and general urologic clinics. Access to gonorrheal clinics would also be of advantage.

X. RESIDENT-INTERN RELATIONSHIP

Those hospitals training both residents and interns should recognize their responsibility to both groups and not curtail too sharply the opportunities ordinarily given to interns by an excess of solicitude for the residents. The residents may, with profit, teach the interns, supervise their records and direct the treatments which interns administer. They should not, however, act so as to diminish the contact of the interns with the attending men or assume the supervisory or disciplinary functions of the staff intern committee.

XI. RECORDING OF CREDIT

A successful completion of a residency or fellowship is recorded in the biographic files of the American Medical Association. It is important, therefore, that all institutions approved for fellowships and residencies in specialties make annual reports to this office. Periods of service in institutions approved by the Council for fellowships and residencies in specialties are given full credit without further inquiry. Services in unapproved institutions are recorded as unclassified assignments.

Arrangements are now being made for an interchange of information between the Council and the examining boards responsible for the certification of specialists. In this way the study and appraisal of residencies and fellowships will lead to the formulation of lists approved by the Council and acceptable to the respective boards.

The specialty boards listed below have been approved by the Council in accordance with the following resolutions of the House of Delegates:

Resolved, That the Council on Medical Education and Hospitals is hereby authorized to express its approval of such special examining boards as conform to the standards of administration formulated by the Council; and be it further

Resolved, That the Board of Trustees of the American Medical Association be urged to use the machinery of the American Medical Association, including the publication of its Directory, in furthering the work of such examining boards as may be accredited by the Council.

American Board of Anesthesiology,
Paul M. Wood, Secretary-Treasurer,
745 Fifth Avenue, New York.

American Board of Dermatology and Syphilology,
C. Guy Lane, Secretary-Treasurer,
416 Marlboro Street, Boston.

American Board of Internal Medicine,
William S. Middleton, Secretary-Treasurer,
1301 University Avenue, Madison, Wis.

American Board of Obstetrics and Gynecology,
Paul Titus, Secretary-Treasurer,
121 South Highland Avenue, Pittsburgh.

American Board of Ophthalmology,
John Green, Secretary,
6830 Waterman Avenue, St. Louis.

American Board of Orthopaedic Surgery,
Frederick A. Chandler, Secretary,
6 North Michigan Avenue, Chicago.

American Board of Otolaryngology,
William P. Wherry, Secretary,
107 South Seventeenth Street, Omaha.

American Board of Pathology,
Frank W. Hartman, Secretary-Treasurer,
2799 West Grand Boulevard, Detroit.

American Board of Pediatrics,
C. Anderson Aldrich, Secretary,
722 Elm Street, Winnetka, Ill.

American Board of Psychiatry and Neurology,
Walter Freeman, Secretary,
1028 Connecticut Avenue N.W., Washington, D. C.

American Board of Radiology,
Byrl R. Kirklin, Secretary,
102 Second Avenue S.W., Rochester, Minn.

American Board of Surgery,
J. Stewart Rodman, Secretary,
225 South Fifteenth Street, Philadelphia.

American Board of Urology,
Gilbert J. Thomas, Secretary,
1009 Nicollet Avenue, Minneapolis.

XII. ADMISSION TO THE APPROVED LIST

Institutions that wish to be approved for residencies or fellowships should apply to the Council on Medical Education and Hospitals of the American Medical Association, 535 North Dearborn Street, Chicago. Application blanks will be furnished and arrangements made for a personal visit of inspection by a member of the Council's staff. Approval is based on full compliance with the foregoing standards. Recognition may be withdrawn whenever it appears that the institution no longer conforms to these essentials or when the positions remain vacant for a period of two or more years.

Essentials for Approved Examining Boards in Specialties

I. ORGANIZATION

1. A special examining board to be approved by the Council should represent a well recognized and distinct specialty of medicine.
2. It should be composed of representatives of the national organizations of that specialty including the related section of the American Medical Association.
3. It should be incorporated.
4. A special board should:
 - a. Determine whether candidates have received adequate preparation as defined by the board.
 - b. Provide a comprehensive test of the ability and fitness of such candidates.
 - c. Certify to the competence of those physicians who have satisfied the requirements of the board.

II. DEFINITION OF SPECIAL FIELDS

The following branches of medicine at present are recognized as suitable fields for the certification of specialists:

- | | |
|------------------------------|--------------------------------|
| 1. Internal Medicine | 7. Dermatology and Syphilology |
| 2. Surgery | 8. Neurology and Psychiatry |
| 3. Pediatrics | 9. Urology |
| 4. Obstetrics and Gynecology | 10. Orthopedic Surgery |
| 5. Ophthalmology | 11. Radiology |
| 6. Otolaryngology | 12. Pathology |
| | 13. Anesthesiology |

III. QUALIFICATION OF CANDIDATES

Each applicant for admission to the examination should be required to present evidence that he has met the following standards:

A. General Qualifications.

1. Satisfactory moral and ethical standing in the profession.
2. A license to practice medicine.
3. Membership in the American Medical Association or, by courtesy, membership in such Canadian or other medical societies as are recognized for this purpose by the Council on Medical Education and Hospitals of the American Medical Association. Except as here provided, membership in other societies should not be required.

B. Professional Education.*

1. Graduation from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association.
2. Completion of an internship of not less than one year in a hospital approved by the same Council.

C. Special Training.**

(To be effective not later than Jan. 1, 1942.)

1. A period of study after the internship of not less than three years in clinics, dispensaries, hospitals or laboratories recognized by the same Council as competent to provide a satisfactory training in the special field of study.
2. This period of specialized preparation shall include,
 - a. intensive graduate training in anatomy, physiology, pathology, and the other basic medical sciences which are necessary to the proper understanding of the disorders and treatment involved in the specialty in question;
 - b. an active experience of not less than eighteen months in hospitals, clinics, dispensaries or diagnostic laboratories recognized by the Council as competent in the specialty;
 - c. examinations in the basic medical sciences of a specialty as well as in the clinical, laboratory and public health aspects.
3. An additional period of not less than two years of study and/or practice.

IV. WITHDRAWAL

For reasons which are deemed sufficient, in the judgment of the Council on Medical Education and Hospitals, the recognition extended by the American Medical Association to holders of certificates from special examining boards may be withdrawn.

*Candidates who submit credentials from institutions outside of the United States and Canada should be required to pass the examination of the National Board of Medical Examiners.

**Candidates whose special training has been received outside of the United States and Canada should submit credentials satisfactory to the examining boards.

REPORT OF THE COUNCIL ON SCIENTIFIC ASSEMBLY

To the Members of the House of Delegates of the American Medical Association:

The death of Dr. J. C. Flippin of Charlottesville, Va., a member of the Council on Scientific Assembly and of the House of Delegates, occurred on Feb. 16, 1939. Dr. Flippin had served as a member of the Council since 1936 and had represented the Medical Society of Virginia in the House of Delegates of the American Medical Association since 1934. As dean of the University of Virginia Department of Medicine and through constant attendance at meetings of important professional societies and active participation in the affairs of this Association and of other medical organizations, Dr. Flippin enjoyed a wide acquaintance with the physicians of the United States and was held in high esteem by all who were privileged to know him and especially by those whose privilege it was to be associated with him in some official capacity. He won the respect and affection of the members of this Council because of

his courteous bearing, his earnestness of purpose, his tolerance of the opinions of others, his readiness to carry his full share of responsibility, his devotion to duty and his loyalty to the highest professional ideals and to the organizations in whose service he was engaged.

The usual meetings of the Council on Scientific Assembly were held during the annual session at San Francisco, and the regular interim meeting of the Council was held in Chicago on Dec. 2, 1938, at which time the annual conference of the Council with the section officers was also held.

PROGRAM CHANGES

As reported to the House of Delegates at the San Francisco session, consideration has been given by the Council to the possibility of effecting changes in the nature of the programs of the scientific sections and the General Scientific Meetings. The Council has had the highly valued suggestions and advice of the section secretaries with respect to this matter, and it will be noted that certain innovations in the scientific programs are being instituted at this session.

A new feature of the program of the General Scientific Meetings will be panel discussions on Tuesday afternoon. The program at that time will be divided into medical and surgical sessions. The program of the medical session will be devoted to a discussion, to be directed by a moderator, which will deal with etiology, therapeutic methods and indications and public health aspects of pneumonia. The program of the surgical session will be given over to a discussion of diseases of the biliary tract, dealing with physiology, differential diagnosis and other important phases of this general subject and will be presented in the same manner as that of the medical session.

For many years it has been an unwritten rule observed by those in charge of the preparation of scientific programs that physicians residing in the city in which an annual session of the American Medical Association is held should not participate as contributors of papers. The Council on Scientific Assembly and the section officers have felt that the operation of this rule has at times prevented the presentation of papers

of significant importance by physicians especially well qualified to discuss topics of general interest. An important innovation in this year's program involves the presentation of a group of papers in the program of the General Scientific Meetings by local physicians.

In some of the section meetings at this annual session the method of presentation of the programs will be changed to some extent. At least one section will devote one of its sessions to a panel discussion, and in certain instances two sections have combined their sessions on Friday into symposiums. It is proposed that experiments somewhat similar to those that are being undertaken this year be continued with the view of developing scientific programs of more general interest and in such manner as to afford opportunity for greater dissemination of helpful information and perhaps for greater participation in discussions by members of the sections and by those who attend the General Scientific Meetings.

The official program of the St. Louis session is submitted as a part of the report of the Council on Scientific Assembly. The programs of the sections are prepared by the officers of the sections, while the program of the General Scientific Meetings has been prepared under the direction of the chairman of the Council on Scientific Assembly.

At a proper time the Council will submit to the House of Delegates nominations for Affiliate Fellowship.

The members of the Council desire to make grateful acknowledgment of the helpful assistance received at the hands of the officers and especially of the secretaries of all the scientific sections.

Respectfully submitted.

JAMES E. PAULLIN, Chairman.

J. GURNEY TAYLOR.

A. A. WALKER.

CLYDE L. CUMMER.

ROCK SLEYSER, President-Elect.

MORRIS FISHBEIN,

Editor, *THE JOURNAL*.

OLIN WEST, Secretary.

} Ex officio.

OFFICIAL NOTES

RADIO BROADCASTS

The radio broadcasts by the American Medical Association and the National Broadcasting Company, under the title *Your Health*, continue as previously announced each Wednesday over the Blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).

Changes in this time will be necessary to take into consideration daylight saving time. Announcement of this change will appear in advance in *THE JOURNAL*. Owing to network conflicts the Chicago broadcast does not occur at 1 p. m. Wednesday but there is a rebroadcast from a recording over Station WENR

at 8 o'clock each Monday evening. The program broadcast each Monday is identical with the network program of the preceding Wednesday.

It has been necessary to curtail the length of the series by omitting the last two programs, which would have been broadcast June 14 and June 21. The series, therefore, will end with the broadcast scheduled for June 7.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

April 12. Learning to Live.

April 19. "Accidents Don't Just Happen—"

April 26. What Is a Doctor?

WOMAN'S AUXILIARY

Michigan

The Kalamazoo auxiliary distributed food to needy families in the community at Christmas.

Mrs. P. L. Thompson gave a talk on her recent world tour at the November meeting of the auxiliary to the Kent County Medical Society, which was attended by 158 members. The auxiliary has placed 172 six month subscriptions to *Hygeia* in the county rural schools and is collecting all printed articles pertaining to medical legislation. Dr. Ruth Herrick, chairman of the section on dermatology and syphilology of the Michigan State Medical Society, spoke on "The New Social Hygiene Program" at a recent meeting of the auxiliary, discussing "Shadow on the Land" by Surgeon General Parrau.

Dr. Claire E. Straith spoke on the projects of the auxiliary to the Washtenaw County Medical Society at the Michigan

Union, Ann Arbor, November 8. Members of the county medical society joined the auxiliary, hearing Dr. Straith speak on plastic surgery.

The auxiliary to the Saginaw County Medical Society has given subscriptions to *Hygeia* to twenty rural schools.

Oklahoma

The Pontotoc County auxiliary was addressed January 18 by Mrs. E. M. Gullatt on socialized medicine.

The women's auxiliary to the Woodward County Medical Society meets on alternate months with the doctors and shares the program. Dr. Coyne Campbell, Oklahoma City, spoke on psychoanalysis and Dr. Johnson of the staff of the Oklahoma State Hospital for Insane reviewed results of insulin treatment of dementia praecox patients, December 14.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Short Course in Internal Medicine.—The division of medical extension, Tulane University of Louisiana, New Orleans, in cooperation with the Medical Association of the State of Alabama, opened a course in internal medicine in Tuscaloosa April 3. Sessions will be held April 10, 24, May 1, 8 and 15. The instructors are Drs. Virgil P. Sydenstricker, professor of medicine, University of Georgia School of Medicine, Augusta, and Julius L. Wilson, associate professor of medicine at Tulane. Dr. Sydenstricker will discuss "Nutritional Diseases," "Diabetes," and "Nephritis," and Dr. Wilson, "Cardiac Diseases," "Acute Infections" and "Pulmonary Tuberculosis."

State Medical Meeting in Montgomery.—The Medical Association of the State of Alabama will hold its annual session at the Whitley Hotel, Montgomery, April 18-20, under the presidency of Dr. Seale Harris, Birmingham, and with the Montgomery County Medical Society acting as host. Out-of-state speakers will include:

- Dr. John S. Turberville, Century, Fla., Prostatic Diseases from the Standpoint of the General Surgeon.
- Dr. Giles S. Bryan, Amory, Miss., Reducing the Pneumonia Death Rate.
- Dr. Edward N. DeWitt, Bridgeport, Conn., Intra-Ocular Tumors.
- Dr. Tinsley R. Harrison, Nashville, Tenn., The Therapeutic Approach to High Blood Pressure.
- Dr. Virgil P. W. Sydenstricker, Augusta, Ga., The Changing Concepts of Deficiency Diseases.
- Dr. Clyde Brooks, New Orleans, Blood Sedimentation.
- Dr. Adrian Taylor, Clifton Springs, N. Y., Clinical Aspects of Thyroid Disease.
- Dr. William H. Anderson, Booneville, Miss., The Community Hospital.
- Dr. Maxwell E. Lapham, New Orleans, Postgraduate Study.

Dr. George T. Pack, New York, will deliver the Jerome Cochran Lecture Wednesday morning on "Recent Advances in the Radiation Therapy of Cancer." There will be a symposium on hospitalization and medical care of the indigent Tuesday morning. Wednesday afternoon a feature will be the unveiling of a statue to James Marion Sims at which the speakers will be Dr. Marye Y. Dabney, Birmingham, on "James Marion Sims, 'The Father of Modern Gynecology'"; Mrs. Marie Bankhead, director, department of archives and history of the state of Alabama, Montgomery, "James Marion Sims, 'Benefactor of Womanhood,'" and Gov. Frank M. Dixon, who will accept the monument. A public session will be held Wednesday evening on "Medical Education in Alabama." The fourteenth annual meeting of the woman's auxiliary will be at the Whitley April 18-19.

ARKANSAS

Society News.—The Sebastian County Medical Society was addressed February 14 by Dr. Raymond T. Smith, Fort Smith, on "The Appearance of the Ear Drum in Certain Middle Ear Conditions."—At a meeting of the Lawrence County Medical Society February 14 Drs. John B. Elders, Walnut Ridge, discussed syphilis and Charles C. Townsend, Walnut Ridge, "Medicine as It Is or State Medicine?"—The Benton County Medical Society was addressed in Rogers February 9 by Drs. Miles E. Foster on "Sedimentation Rate in Gynecology"; Sidney J. Wolfermann, "Socialized Medicine," and William R. Brooksher, "Roentgen Ray Treatment of Infections." All are of Fort Smith. The society was addressed in Bentonville March 9 by Drs. Jesse D. Riley, State Sanatorium, on "Collapse Therapy" and Clyde L. McNeil, Rogers, "Sulfanilamide."

CALIFORNIA

Bequest to Library.—The income from a fund of \$10,000 will be paid to the library of the Los Angeles County Medical Association, Los Angeles, in accordance with a stipulation in the will of the late Dr. Walter Jarvis Barlow. The name of Dr. Barlow has been prominently associated with the history of the library. In 1906 he erected a building to house what was then known as the Hendryx Medical Reference Library. In 1907 a building was opened in the name of the Barlow Medical Library Association. In 1932 negotiations were started

to transfer the library to the county medical association, which in 1934 opened its permanent home, providing quarters for the library. The entire collection is known as the Library of the Los Angeles County Medical Association.

CONNECTICUT

Society News.—Dr. Emil Novak, Baltimore, recently addressed a public meeting sponsored by the Medical Information Bureau of the Hartford Medical Society and the Hartford County Medical Association on "Cancer: A Message of Hope."

Changes in Health Officers.—The *Connecticut Health Bulletin* announces the following changes in health officers:

- Dr. Cyrus E. Pendleton, appointed in Colchester to succeed the late Dr. Edward J. Howland.
- Dr. Harold A. Howard of Wethersfield to succeed the late Dr. Edward G. Fox.
- Dr. Robert C. Sellew of Canaan.
- Dr. Charles K. Skreczek Jr. of Shelton to succeed Dr. William S. Randall.
- Dr. Joseph S. Stygar of Derby to succeed Dr. Thomas F. Plunkett.
- Dr. John M. Renchan of Ansonia to succeed Dr. Louis Howard Wilmet.
- Dr. George E. Roch of Willimantic to succeed Dr. Reuben Rothblatt.

DISTRICT OF COLUMBIA

University News.—Reuben L. Kahn, D.Sc., Ann Arbor, Mich., delivered a series of lectures on "Interpreting the Serology of Syphilis" at the U. S. Naval Medical School, Naval Medical Center, Washington, March 21-24.

Public Health Forum.—Georgetown University recently conducted its second annual public health forum. Dr. Ella Oppenheimer opened the series of lectures February 2 with a discussion of "Child Welfare." Other speakers were Dr. Custis Lee Hall, February 9, on "Crippling Conditions in Children"; J. Edward Routh, Ph.D., February 16, "Problem Children," and Fred R. Sanderson, February 23, "Common Household Poisons." The series ran six weeks.

GEORGIA

State Medical Meeting at Atlanta.—The ninetieth annual session of the Medical Association of Georgia will be held at the Biltmore Hotel, Atlanta, April 25-28, under the presidency of Dr. Grady N. Coker, Canton, and with the Fulton County Medical Society acting as host. The presidential address will be entitled "Modern Trends of Medical Practice." The speakers will include:

- Dr. Hartwell Joiner, Gainesville, Prophylactics and the Common Cold.
- Dr. Carl C. Garver, Atlanta, Pneumolysis as an Adjunct of the Treatment of Pulmonary Tuberculosis.
- Dr. Ernest F. Wahl, Thomasville, Effect of Nervous Influences on Nutrition.
- Dr. Joseph Yampolsky, Atlanta, Use of Sulfanilamide in Routine Pediatric Practice.
- Dr. Harrison H. Shoulders, Nashville, Tenn., Some Phases of Medical Economics.
- Hon. Robert F. Maddox, Atlanta, chairman, state board of health, The Social and Economic Value of Health.
- Dr. Crawford F. Barnett Jr., Atlanta, Chronic Gastritis.

Dr. John S. Lundy, Rochester, Minn., will deliver the Abner Wellborn Calhoun Lecture Wednesday on "Suggestions for the Use of Anesthetics and Analgesics in General Medical Practice." A symposium on industrial surgery will be held the same day and one on cancer Thursday. Entertainment will include the annual luncheon of the Georgia Radiological Society, and the annual dinners of the alumni of the medical schools of Emory and Georgia universities. Speakers before the woman's auxiliary, which will meet April 25-27, will include Drs. William H. Myers, Savannah, president-elect of the state medical association, on "Evolution in the Practice of Medicine."

ILLINOIS

Society News.—Dr. Lawrence F. Weber, Chicago, discussed common diseases of the skin before the Lawrence County Medical Society in Lawrenceville April 5.—The Will-Grundy County Medical Society was addressed in Joliet by Dr. Stanley Gibson, Chicago, April 7 on acute conditions of the abdomen in children.—At a meeting of the Madison County Medical Society, Alton, April 7, Dr. John S. Coulter, Chicago, discussed the "Home Treatment of Chronic Arthritis."

Chicago

Institute for Negro Health Workers.—The Tuberculosis Institute of Chicago and Cook County will conduct a two day institute for Negro health workers in cooperation with the National Tuberculosis Association April 17-18 at the Y. M. C. A., Wabash Avenue and Thirty-Eighth Street. The program will cover the following four themes: A modern con-

cept of tuberculosis, what it is, how it develops; best methods for controlling tuberculosis, including case-finding and hospitalization; the organized campaign against tuberculosis with special stress on Negro organization, and the possibility of controlling tuberculosis.

Society News.—Dr. Arthur Steindler, Iowa City, among others, addressed the Chicago Orthopedic Society and the Chicago Roentgen Society March 9 on "Compensation and Derotation in the Treatment of Scoliosis."—Dr. Frances Hannett discussed "What Constitutes a Psychiatric Problem in General Practice" before the Chicago Council of Medical Women March 22 and Dr. Adelaide M. Johnson, "Treatment of Children's Problems with Special Reference to Play Therapy."—The Chicago Society of Internal Medicine was addressed March 27, among others, by Drs. Heinrich Necheles, Rudolf Schindler and Rubin L. Gold on "Surgical Gastritis: A Study on the Genesis of Gastritis Associated with Ulcers."—Dr. Leo K. Campbell gave a public lecture at the Chicago Woman's Club March 8 under the auspices of the Chicago Medical Society on "Eat, Drink and Grow Fat."—The Chicago Pediatric Society was addressed March 21 by Drs. Adrian D. M. Kraus on "Periodic Paralysis"; Eugene T. McEnery, "Epidermoid Cysts of the Spleen," and Lloyd E. Harris, "Bromide Intoxication in a Child Four Years of Age."—At a meeting of the Chicago Ophthalmological Society March 20 the speakers were Dr. John G. Bellows and Herman Chinn, Ph.D., on "Distribution of Sulfanilamide in the Eye"; Drs. Bertha A. Klien, "Concerning the Dictyoma Retinae" and Samuel S. Blankstein, Milwaukee, "Comparison of Visual Acuities."

INDIANA

Tri-State Meeting.—The annual meeting of the Northern Tri-State Medical Association, including Michigan, Ohio and Indiana, will be held at the Hotel Oliver, South Bend, April 11. The speakers will include:

- Dr. Albert C. Furstenberg, Ann Arbor, Mich., Nasal Accessory Sinus Disease in the General Practice of Medicine.
- Dr. Daniel P. Foster, Detroit, Newer Concepts of Diabetes Mellitus.
- Dr. Charles G. Johnston, Detroit, Physiologic Implications in the Management of Intestinal Obstruction.
- Dr. David Edwin Robertson, Toronto, Fractures in Children.
- Dr. Robert M. Moore, Indianapolis, Diagnosis and Treatment of Heart Disease.
- Dr. A. Jerome Sparks, Fort Wayne, Ind., Calculi in the Upper Urinary Tract.
- Dr. Frank C. Walker, Indianapolis, Relation of Cervical Lesions to Carcinoma of the Cervix Uteri.
- Dr. Harold N. Cole, Cleveland, Relapse in Syphilis: Its Importance in Diagnosis, the Public Health Aspect, and Its Treatment.
- Dr. Waldo E. Nelson, Cincinnati, Treatment of Diabetes Mellitus in Children.
- Dr. Bruce K. Wiseman, Columbus, Ohio, The Cytolytic Functions of the Spleen in Relation to the Blood Diseases.

IOWA

Society News.—Dr. Soma Weiss, Boston, will discuss "Cardiac Asthma and Associated Syndromes" before the Linn County Medical Society, Cedar Rapids, April 24.—Dr. Morris Edward Davis, Chicago, addressed the Black Hawk County Medical Society, Waterloo, March 14 on "Endocrine Therapy in Obstetrics and Gynecology."

Grant to Study Infant Nutrition.—Dr. Philip C. Jeans, professor of pediatrics, State University of Iowa College of Medicine, Iowa City, has received a grant of \$7,500 from the Borden Company for the continuation of his investigations in infant nutrition. The grant was made available through the Council for Pediatric Research of the American Academy of Pediatrics.

KANSAS

Society News.—Dr. James Roscoe Miller, Chicago, addressed the Shawnee County Medical Society February 6 on "Diagnosis and Treatment of Coronary Occlusion."—The Wyandotte County Medical Society was addressed in Kansas City February 21 by Drs. Eugene D. Liddy Jr. and Frederic A. Speer on asthma and diagnosis of fever in infancy, respectively.

LOUISIANA

Instruction for Medical Reserve Officers.—The department of graduate medical studies of Tulane University of Louisiana School of Medicine, New Orleans, will conduct a two weeks course of instruction for medical reserve officers of the fourth corps of the U. S. Army April 11-22.

Society News.—Dr. Charles E. Galloway, Evanston, Ill., discussed "Pathology of the Cervix" before the Orleans Parish Medical Society and the New Orleans Gynecological and Obstetrical Society March 13. The parish medical society was

addressed February 27 by Drs. Carlo J. Tripoli on "Acute Lymphocytic" and Rudolph Matas, "Recent Observations in the Spanish War."—Dr. Clarence P. May discussed "Medical Psychology" before the Rapides Parish Medical Society, Alexandria, February 6.

MARYLAND

Society News.—A symposium on marihuana was presented before the Baltimore City Medical Society February 3 by Rowland K. Adams, judge, supreme bench of Baltimore City; Dr. Manfred S. Guttmacher, chief medical officer of the supreme bench, and Mr. H. J. Wolln of the treasury department, bureau of D. C. At a meeting of the society March 3, the speakers included Drs. Henry J. Walton on "What Can Be Done for Patients Suffering from Far Advanced Bone Metastasis," and Richard T. Shackelford, "Peritoneoscopy, Its Uses and Limitations."—Dr. Thomas Archibald Malloch, librarian of the New York Academy of Medicine, gave an illustrated lecture on William Osler before the Osler Historical Club, Baltimore, March 21.

MASSACHUSETTS

The Cutter Lecture.—Dr. Frederick F. Russell, professor of preventive medicine and epidemiology, emeritus, Harvard Medical School, Boston, will deliver the annual Cutter Lecture in Preventive Medicine at the school April 17. His subject will be "The History of Yellow Fever as an Illustration of Methods of Study and Control of Virus Diseases."

Health Education Institute.—The New England Health Education Association, in cooperation with the departments of education, state departments of health and tuberculosis associations of the New England states, will hold an institute on health education April 21-22 at the William Barton Rogers Building, Massachusetts Institute of Technology, Cambridge.

MICHIGAN

Society News.—Dr. Jacob P. Greenhill, Chicago, discussed "The Use of Androgens in Gynecology" before the Detroit Obstetrical and Gynecological Society March 7.—Dr. William P. Tew, London, Ont., discussed "Diagnosis and Treatment of Hemorrhage Late in Pregnancy" before the Genesee County Medical Society in Flint February 8.—Dr. Morris Edward Davis, Chicago, addressed the Berrien County Medical Society in Benton Harbor March 16 on "Present Day Diagnosis and Treatment of Hemorrhage Late in Pregnancy."

Venereal Disease Director Appointed.—Dr. Thomas E. Gibson, Paw Paw, formerly director of the Van Buren County Health Department, has been appointed director of the venereal disease division of the Michigan State Department of Health. Previously Dr. Gibson was director of the Genesee County Health Department and of the Isabella County Health Department and in 1931 he served with the state department of health for six months on a Rockefeller Foundation scholarship. He graduated at the College of Medical Evangelists, Loma Linda-Los Angeles, in 1931.

Graduate Programs.—The attending staff of Receiving Hospital, Detroit, has arranged the programs of the monthly staff meetings for the remainder of this academic year as a continuing graduate activity, according to the Detroit *Medical News*. All former interns of the hospital are invited. The speakers at the meeting March 8 were Warren O. Nelson, Ph.D., professor of anatomy, Wayne University School of Medicine, Detroit, on "Physiology of the Ovarian Hormones"; Oliver Kamm, scientific director of research, Parke, Davis & Co., "The Standardization and Chemical Relationships of the Ovarian Hormones," and Dr. Ward F. Seeley, professor of gynecology and obstetrics at Wayne, "Hormonal Treatment of Menstrual Disorders."

Personal.—Dr. George McL. Waldie has resigned as medical superintendent of the Copper Country Sanatorium, Houghton, effective on the appointment of a successor. He has held the position for twelve years.—Dr. Robert B. Harkness, Hastings, director of the Barry County health department, was elected president of the State Council of Health at its advisory session with the state health commissioner in Lansing recently, succeeding Ura G. Rickert, D.D.S., Ann Arbor, who died Oct. 22, 1938. P. C. Lowery, D.D.S., Detroit, vice president of the American Dental Association, has been appointed a member of the council to serve the unexpired term of Dr. Rickert, which ends June 30, 1941.—Dr. Thomas Y. Ho, St. Johns, was recently reelected secretary of the Clinton County Medical Society for the sixteenth consecutive time.

MINNESOTA

Special Lecture.—Dr. Ludvig Hektoen, executive director, National Advisory Cancer Council, U. S. Public Health Service, Washington, D. C., will present the annual Minnesota Cancer Institute Lecture in Minneapolis April 17. His subject will be "Advances in the Knowledge and Control of Cancer."

State Radiologic Meeting.—The Minnesota Radiological Society held its spring meeting in St. Paul, March 18. The speakers included:

Ancel Keys, Ph D., and Dr. Hymer L. Friedlen, Minneapolis, Roentgen Kymographic Studies in Cardiac Physiology.

Drs. Harry M. Weber and Clarence Allen Good Jr., Rochester, A Series of Interesting Duodenal Lesions

Drs. Clarence P. Truog and Raymond E. Burge, Minneapolis, Bone Atrophy. Report of an Unusual Case.

Dr. Henning M. Berg, Bismarck, N. D., The Practice of Radiology in Sweden

A symposium on radiation therapy of neoplasm of the stomach was presented by Drs. Arthur U. Desjardins, Rochester; Chauncey N. Borman, Cyrus O. Hansen and Russell W. Moise, Minneapolis; Edward Schons, St. Paul, and Wilhelm Stenstrom, Ph.D., Minneapolis. At the dinner, Drs. John L. McKelvey spoke on "Medical Experiences in China," and Harry M. Weber, Rochester, "Observations on Roentgenology in Europe."

MISSISSIPPI

Society News.—At a meeting of the Pike County Medical Society in McComb January 5 Drs. Emile F. Naef and Conrad G. Collins, New Orleans, spoke on "First Infection Type Tuberculosis in Childhood" and "Causes and Treatment of Vaginitis" respectively.—A joint meeting of the faculty of the University of Mississippi and the Northern Mississippi Medical Society was addressed in Oxford January 19 by Drs. Paul H. Harrison, Springfield, Ill., on "Suppurative Arthritis of the Hip"; Samuel W. Banks, Chicago, "The Intervertebral Destruction in Relation to Back Pain" and Edward L. Compere, Chicago, "Methods of Treatment for Fractures of the Neck of the Femur."

MISSOURI

Lectures on Pediatrics and Obstetrics.—The state board of health, the committee on maternal welfare of the Missouri State Medical Association and the extension service of the University of Missouri College of Agriculture are sponsoring lectures on obstetrics and pediatrics throughout the state.

Society Condemns Smoke Nuisance.—The St. Louis Medical Society recently adopted a resolution condemning the smoke nuisance in St. Louis as a danger to health and requesting city authorities to take immediate steps to "abolish the menace," newspapers reported. The resolution adopted by the society incorporates recent resolutions of the Ear, Nose and Throat Club, the Trudeau Society and the St. Louis Pediatric Society expressing opinions on the subject.

Retires as Superintendent of Barnes Hospital.—Dr. Louis H. Burlingham has retired after twenty-two years' service as superintendent of Barnes Hospital, St. Louis, effective April 1. According to *Modern Hospital*, Dr. Burlingham submitted his resignation a year ago, but the board of trustees of the hospital declined to accept it, granting him instead a leave of absence in the hope that he would regain his health. Dr. Burlingham graduated at Johns Hopkins University School of Medicine, Baltimore, in 1906

Society News.—Round table discussions form a new type of program recently introduced at meetings of the St. Louis Medical Society. The subject "Anemias—Clinical and Laboratory Diagnosis" was discussed February 24 with Dr. Goronwy O. Broun as the leader; "Anemia—Modern Methods of Treatment" was the theme March 3 with Dr. Lawrence D. Thompson as the leader.—Dr. Timothy Leary, Boston, discussed "The Most Important Professional Disease: Coronary Sclerosis" before the Kansas City Academy of Medicine February 17.

MONTANA

Personal.—Dr. Joseph L. Richards, Polson, has been reappointed county physician and secretary of the board of health of Lake County.

Society News.—Dr. Roy V. Morledge, Billings, was elected president of the Montana Academy of Ophthalmology and Oto-Laryngology at its semiannual meeting February 6 and Dr. Ashley W. Morse, Butte, was reelected secretary.

NEW YORK

State Medical Meeting at Syracuse.—The annual meeting of the Medical Society of the State of New York will be held April 24-27 at the Hotel Onondaga and the Hotel Syracuse, Syracuse, under the presidency of Dr. William A. Groat, Syracuse. Two general sessions will be devoted to discussions of "Emergencies—Their Recognition and Treatment" and "Chronic Diseases—Their Early Recognition" In the first session the speakers will be:

Dr. Thew Wright, Buffalo, The Acute Abdomen

Dr. Edward A. Schumann, Philadelphia, Obstetrical Emergencies

Dr. Orman C. Perkins, Brooklyn, Acute Cerebral Emergencies

Dr. Edward C. Reifstein, Syracuse, Cardiac Emergencies

In the second general session addresses will be made by:

Dr. Samuel A. Levine, Boston, Early Evidence of Cardiovascular Disease.

Dr. Francis Carter Wood, New York, Early Diagnosis of Cancer (the first A. Walter Suiter Lecture).

Dr. James Alexander Miller, New York, Early Diagnosis and Treatment of Pulmonary Tuberculosis

Dr. Clarence O. Cheney, White Plains, Early Recognition of Mental Diseases and Their Treatment.

Guest speakers who will address the sections will include

Dr. Thomas E. Jones, Cleveland, Surgical Treatment of Diverticulitis

Dr. Harry E. Bacon, Philadelphia, Extrarectal Metastatic Malignancy Simulating Primary Carcinoma of the Rectum

Dr. Trygve Gundersen, Boston, Diagnosis and Treatment of Diseases of the Cornea.

Dr. Maurice B. Strauss, Boston, Etiology and Treatment of True Toxemia of Pregnancy.

Dr. Harold R. Griffith, Montreal, Canada, Management of Complications Arising During Cyclopropane Anesthesia.

Drs. Bernard L. Wyatt, Robert A. Hicks and Harry E. Thompson, Tucson, Ariz., Chronic Arthritis—Differential Diagnosis—Special Treatment Methods: Medical, Orthopedic, Physical Therapy.

Dr. Donald Guthrie, Sayre, Pa., The Advantages of Silk in General Surgery.

The annual banquet will be at the Hotel Syracuse Tuesday evening April 25. Addresses will be made by Mr. Alexander Woolcott, New York; Drs. Logan Clendening, Kansas City, Mo.; William A. Groat, Syracuse, president of the society, and Terry M. Townsend, New York, president-elect.

New York City

The Salmon Lectures.—The seventh series of Thomas William Salmon Memorial Lectures will be delivered by Dr. Edward A. Strecker, chairman of the department of psychiatry, University of Pennsylvania School of Medicine, Philadelphia, at the New York Academy of Medicine April 14, 21 and 28. Dr. Strecker's general subject will be "Beyond Clinical Frontiers," and the individual titles, "The Massive Retreat from Reality"; "Crowd-Mindedness" and "Threats to Our Culture."

Long Island College Alumni Meeting.—The Alumni Association of the Long Island College of Medicine will hold its annual Alumni Day April 25. The morning program will include addresses by Drs. Frederick Schroeder on "Ancient and Modern Methods of Poisoning"; William A. Jewett, "Treatment of Pelvic Malignancies at the Long Island College Hospital" and Samuel Potter Bartley, "Reconstruction of the Arm and Hand" At a luncheon at the hospital Mr. Tracy Voorhes, president of the college board of regents, will speak on "A Layman's Thoughts on the Modern Problems Facing the Medical Profession," and Dr. Nathaniel P. Rathbun, "Some of the Problems Which the Medical Profession Is Facing Today." The annual banquet will be held in the evening at the Columbus Club with Drs. Frank L. Babbott, president of the college, John Sturdivant Read and Cassius H. Watson as the speakers

Health Calendar for the World's Fair.—Observances of special days have been scheduled by several organizations for the period of the New York World's Fair. A recent announcement includes:

May 1-8, National Child Health Week.

May 9, Dental Society of New York State.

May 12, National Hospital Day and Nurses' Day.

May 16, American Medical Association.

May 17, Red Cross Day

May 19, Tenth International Congress of Military Medicine and Pharmacy

May 31, Medical Society of the State of New York.

June 3, American Academy of Pediatrics

June 4, American Society for the Hard of Hearing.

June 18, New York City Health Department.

June 23, School Health Day.

June 27, County Medical Society Day.

October 21, National Health Day

Society News.—At a meeting of the Medical Society of the County of New York February 27 a symposium on the proposed national health program was presented by Drs. Martha M. Eliot, Washington, D. C., John P. Peters, New Haven,

Conn., Samuel J. Kopetzky and Frederic E. Elliott.—Drs. John L. Rice, health commissioner, and Stanley R. Woodruff, Jersey City, N. J., addressed the Harlem Medical Association March 1 on "The Role of the Private Physician in Public Health" and "Management of Stones in the Urinary Tract" respectively.—Dr. Herbert Willy Meyer addressed the New York Surgical Society March 1 on "Perforations of the Gastrointestinal Tract."—Dr. Louis Lichtenstein addressed the New York Pathological Society February 23 on "Pathologic Findings Following Therapeutic Hyperthermia" and Drs. Abraham Penner and Alice Bernheim, "Hemostatic Mechanisms as a Cause of Visceral Lesions."—A symposium on arthritis was presented at a stated meeting of the New York Academy of Medicine March 2 by Drs. Philip S. Hench, Rochester, Minn.; Walter Bauer, Boston, and Ralph H. Boots, New York.—Dr. J. Irving Kushner, among others, addressed the Bronx Gynecological and Obstetrical Society February 27 on "Obstetrics in a General Hospital (10,000 Cases at the Bronx Hospital)."

NORTH CAROLINA

Society News.—Dr. Walter R. Johnson, Asheville, addressed the Buncombe County Medical Society, Asheville, March 20, on "The Use of the Gastroscope in Diagnosis of Stomach Disorders." Dr. James P. Rousseau, Winston-Salem, addressed the society in Asheville February 20 on "Roentgen Treatment of Pneumonia." In the afternoon the society held a panel discussion of pneumonia.—At a meeting of the Scotland County Medical Society in Laurinburg January 19 the speakers were Drs. Douglas Jennings, Bennettsville, S. C., on obstetrics; William T. Rainey, Fayetteville, on congestive heart failure, and William D. James, Hamlet, on the work of the state board of medical examiners.—Dr. Russell L. Haden, Cleveland, addressed the New Hanover County Medical Society, Wrightsville Beach, February 27 on "Nutritional Deficiency Diseases."

OHIO

Annual Library Meeting.—Dr. Cyrus C. Sturgis, Ann Arbor, Mich., addressed the second annual meeting of the Harold Brittingham Memorial Library at the Cleveland City Hospital January 17. His subject was "The Historical Development of Knowledge Concerning Blood Transfusion and Appraisal of Its Value." The library now contains 1,300 bound volumes and 500 books, it was reported. During 1938 4,800 visitors were registered and 1,500 items were borrowed.

Society News.—Dr. Arthur U. Desjardins, Rochester, Minn., addressed the Academy of Medicine of Cincinnati March 21 on "Radiotherapy for Inflammatory and Malignant Conditions." Dr. Herman O. Mosenenthal, New York, discussed "Experiences with Protamine Zinc Insulin" March 7.—Dr. Grover C. Penberthy, Detroit, addressed the Montgomery County Medical Society, Dayton, March 17 on "Burns, Their Treatment and Management."—Dr. George M. Curtis, Columbus, addressed the Mahoning County Medical Society, Youngstown, March 21 on "Iodine Metabolism in Thyroid Disease."

OREGON

Society News.—A discussion of thrombosis and embolism was presented before the Multnomah County Medical Society, Portland, March 15 by Drs. Charles H. Manlove, Warren C. Hunter and Herbert H. Fosskett.—Dr. Virgil E. Dudman, Portland, addressed the Central Willamette Medical Society, Eugene, February 2 on "Obstetrics: Emergency Conditions."

Changes in Health Officers.—Dr. Courtney M. Smith, Oregon City, has resigned as health officer of Clackamas County to become assistant health officer of Portland. Dr. Daniel P. Trullinger, Oregon City, succeeded Dr. Smith in Clackamas County.—Dr. Gerald E. Stark, Coquille, has been appointed health officer of Coos County to succeed Dr. Charles L. Coyle, Grants Pass, who resigned recently.

PENNSYLVANIA

Professor Krogh Lectures at Swarthmore.—Prof. August Krogh of the University of Copenhagen, Denmark, is delivering a series of lectures at Swarthmore College, Swarthmore. The general subject of the series is "The Comparative Physiology of Respiratory Mechanisms."

Personal.—Dr. Howard C. Frontz, Huntingdon, was recently elected to serve his second term as president of the Huntingdon County Medical Society; his first election was in 1897.—Dr. Thomas H. A. Stites, Nazareth, has been appointed medical director of the Cresson Sanatorium, State, a position he held from 1923 to 1935. He succeeds Dr. Louis A. Wesner.

—Dr. Samuel J. Dickey, West Chester, health officer of Chester County, has been appointed director of the division of tuberculosis in the state department of health.

Philadelphia

Scarlet Fever Outbreaks.—Eighty-four students at Girard College were reported ill of scarlet fever March 24. Dick tests were to be made of the other 1,646 students.—The Sigma Phi Epsilon fraternity house at Temple University was quarantined March 21 when four of twenty-one residents became ill of scarlet fever.

Society News.—Drs. Manuel M. Pearson and Marcus David Burnstine, among others, addressed the Philadelphia Psychiatric Society March 10 on "Psychosis Precipitated by Sulfanilamide."—Among the speakers at a meeting of the Philadelphia Academy of Surgery March 6 were Drs. John S. Lockwood and Virgil H. Moon on "Bacteriologic Considerations in Wound Healing" and "Early Recognition of Shock and Its Differentiation from Hemorrhage," respectively.—At a meeting of the Philadelphia Laryngological Society March 7 the speakers included Drs. Matthew S. Ersner on treatment of type III pneumococcus meningitis with sulfapyridine; David Myers, treatment of otitic sepsis and meningitis with sulfanilamide, and Merrill B. Hayes, employment of sulfanil amino-pyridine in other otorhinologic conditions.—Speakers before the Philadelphia County Medical Society March 8 were Drs. Samuel W. Sappington on "Heparin in Blood Transfusion"; Charles B. Hollis, "Effect of Tobacco on the Respiratory Tract," and George D. Geckeler, "Coronary Artery Disease."

RHODE ISLAND

Committee on Industrial Health Appointed.—Dr. Charles F. Gormly, Providence, has been appointed chairman of a committee on industrial health of the Rhode Island Medical Society. The appointment of the committee was authorized at a meeting of the house of delegates in January.

SOUTH DAKOTA

Dr. Cook Appointed State Health Superintendent.—Dr. John F. D. Cook, Langford, for many years secretary of the South Dakota State Medical Association, has been appointed superintendent of the state board of health. He succeeds Dr. Park B. Jenkins, Pierre.

TEXAS

Hospitals Opened.—The Patterson Memorial Hospital, Troup, was opened recently. The new eighteen room hospital was built by Miss Gillie Patterson, Troup, in memory of her parents. The Littlefield Hospital and Clinic, with twenty-three private rooms, two wards of two beds each and five bassinets, was opened recently.

Bequest to Sealy Hospital.—Mrs. Jennie Sealy Smith, who died Oct. 10, 1938, directed in her will that after the payment of certain bequests the balance of her estate, estimated at \$4,000,000, be paid to the Sealy and Smith Foundation for the John Sealy Hospital, Galveston. A private and semi-private pavilion is to be erected in memory of Mrs. Smith's husband, R. Waverly Smith.

VIRGINIA

Society News.—Drs. Edwin C. Hamblen, Durham, N. C., and Charles P. Mangum, Richmond, addressed the Danville-Pittsylvania Academy of Medicine March 14 on "Endocrine Disturbances and Present Day Endocrine Therapy" and "Pediatric Endocrinology" respectively.—Dr. Beverly C. Smith, New York, addressed the Roanoke Academy of Medicine February 6 on "Diagnosis and Treatment of Peripheral Vascular Diseases" and Dr. Henry Lee, Roanoke, on "Postoperative Thrombophlebitis."

State Society's Cancer Committee.—The advisory committee to the Virginia Cancer Foundation, appointed recently by the president of the Medical Society of Virginia, has been enlarged and will now act as an advisory committee to the Women's Field Army of the American Society for the Control of Cancer, the cancer foundation and any other agencies seeking advice or endorsement on this subject. Dr. Edwin P. Lehman, Charlottesville, is chairman and the members are: Drs. Irl C. Riggan, Richmond, state health officer; Isaac A. Bigger, Richmond; Frederick M. Hodges, Richmond; Robert L. Payne, Norfolk; Richard P. Bell, Staunton, and Isaac C. Harrison, Danville. Dr. Hugh H. Trout, Roanoke, president-elect of the state society, and Dr. Alexander F. Robertson Jr., Staunton, president, are ex officio members.

WASHINGTON

Puget Sound Surgical Meeting.—Dr. Philip D. Wilson, New York, was the guest speaker at the annual meeting of the Puget Sound Surgical Society in Seattle March 10-11. Dr. Wilson delivered an address March 10 at a dinner at the Rainier Club on "Pioneers in Orthopedic Surgery." Saturday he conducted clinics at King County Hospital and in the evening spoke at the annual banquet on "Inequality of Leg Length and Methods of Correction."

Society News.—Dr. Brien T. King, Seattle, addressed the Walla Walla Valley Medical Society, Walla Walla, February 9 on goiter and on recent research on the restoration of the abductor function of the larynx following paralysis due to recurrent nerve paralysis. A symposium on the biliary tract was presented before the King County Medical Society, Seattle, March 6, by Drs. Clyde R. Jensen, Thomas W. Blake, Charles E. Watts and John A. Duncan. Dr. Sterling Bunnell, San Francisco, was the guest speaker at the annual meeting of the Tacoma Surgical Club April 1. His subject was "Primary Repair of the Injured Hand." A symposium on gallbladder disease was presented before the Spokane County Medical Society, Spokane, March 16 by Drs. James M. Nelson, Joseph Melvin Aspray, Charles M. N. Anderson, Robert L. Rotchford and Rudolph G. Andres. Drs. Samuel E. Light and John W. Gullikson addressed the Pierce County Medical Society, Tacoma, February 14 on "Treatment of Acne Vulgaris" and "Spinal Anesthesia" respectively.

WYOMING

Personal.—Dr. Walter M. Lacey, Cheyenne, has resigned from the state board of medical examiners and has been succeeded by Dr. Jacob R. Pierce, Thermopolis.

Changes in State Board of Health.—Dr. Enos G. Denison, Sheridan, and Raymond G. Howe, D.D.S., Casper, have been appointed members of the state board of health and Dr. Marshall C. Keith, Casper, has been made state health officer. Dr. Keith is secretary of the Wyoming State Medical Society.

GENERAL

Nurses Wanted for Latin American Service.—At the request of health authorities of one of the Latin American republics, the Pan American Sanitary Bureau, Washington, D. C., is seeking nurses familiar with Spanish and if possible trained in care of mental cases. Contracts will be offered for two years and transportation to their destination will be paid.

The Society of University Surgeons.—This society, organized in 1938, held its first annual meeting at the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., in February. Dr. Samuel J. Stabins, Rochester, was elected president; Dr. Warren H. Cole, Chicago, president-elect, and Dr. Frank Glenn, New York, secretary. The society is made up of surgeons who have completed a surgical residency in one of the following schools and are now engaged in teaching in these or other institutions: University of Chicago, University of Cincinnati, University of Rochester, Columbia, Cornell, Harvard, Johns Hopkins, Vanderbilt, Washington and Yale universities.

Changes in Status of Licensure.—The State Board of Health of Kentucky has reported the following action:

Dr. Ernest Raspberry Alexander, Cynthiana, license revoked January 7 for violation of the Harrison Narcotic Act.

Dr. Walker L. Stumbo, Lackey, license revoked January 7; allowed to practice on probation.

The New York State Board of Medical Examiners reports the following action:

Dr. Edmund K. Macomber, 745 New Scotland Avenue, Albany, license revoked Nov. 16, 1938, for criminal abortion.

The Virginia State Board of Medical Examiners recently reported the following action:

Dr. J. Burton Nowlin, Lynchburg, license revoked Dec. 14, 1938, for violations of the Harrison Narcotic Act.

Dr. Gilmer Rosser Shelton, Dabney, license revoked Dec. 14, 1938, on account of violations of parole in relation to the Harrison Narcotic Act.

Society News.—The annual convention of the American Red Cross will be held in Washington, D. C., April 24-27. The twenty-fourth annual meeting of the American Association of Industrial Physicians and Surgeons with the American Conference on Occupational Diseases and Industrial Hygiene will be held at the Hotel Statler, Cleveland, June 5-8. The American Society of Anesthetists will meet in New York April 14 with the following speakers: Drs. Philip D.

Woodbridge, Boston, and Karl A. Connell, Branch, N. Y., on "Hazards of Explosion from the Point of View of the Anesthetist," and Joseph Warren Horton, Sc.D., Cambridge, Mass., "Factors Affecting the Occurrence and Prevention of Electrostatic Sparks."

Bequests and Donations.—The following bequests and donations have recently been announced:

St. Joseph's Hospital, Syracuse, N. Y., \$147,932.93 by the will of the late George Doherty. Other institutions sharing equally in the residuary estate include the Syracuse Memorial Hospital, General Hospital of Syracuse, Syracuse Free Dispensary and St. Mary's Maternity Hospital and Infants' Asylum.

Lenox Hill Hospital and New York Post-Graduate Medical School and Hospital, \$20,000 each, and New York Infirmary for Women and Children, \$15,000, by the will of Mrs. Amalia F. Morse; all are in New York.

Lenox Hill Hospital, New York, \$150,000 by the will of the late Jacob Ruppert.

Eye and Ear Hospital of Pittsburgh, \$3,000 by the will of Dr. James A. Lippincott.

St. Luke's Hospital, New York, \$5,000, and New York Eye and Ear Infirmary, \$2,500 by the will of Miss Virginia Scott Hoyt.

Methodist Episcopal Hospital and Methodist Home for the Aged, Philadelphia, \$5,000 by the will of the late Miss Emily Leaning Goble.

Shriners Hospital for Crippled Children and Lankenau Hospital, Philadelphia, will share with three other institutions about \$600,000 from the estate of the late C. Henry Strecker.

Special Society Elections.—Dr. James L. Dunavant, Ripley, Tenn., was chosen president-elect of the Mid-South Post Graduate Medical Assembly at the annual meeting in Memphis, Tenn., in February. Dr. Herbert Fay H. Jones, Little Rock, became president. Dr. Charles J. Andrews, Norfolk, was named president-elect of the Tri-State Medical Association of the Carolinas and Virginia at the annual meeting in Charleston, S. C., in February. Vice presidents elected were Drs. John S. Horsley, Richmond, Va.; Harold S. Clark, Asheville, N. C., and William R. Wallace, Chester, S. C. Dr. James M. Northington, Charlotte, N. C., was reelected secretary. The 1940 meeting will be in Richmond. Dr. Robert D. Schrock, Omaha, was chosen president-elect of the American Academy of Orthopaedic Surgeons at its seventh annual convention in Memphis January 15-19, and Dr. George E. Bennett, Baltimore, was installed as president. Other officers are Drs. Alfred R. Shands Jr., Wilmington, Del., vice president; Eugene Bishop Mumford, Indianapolis, treasurer; Carl E. Badgley, Ann Arbor, Mich., secretary, and Philip Lewin, Chicago, historian and librarian. The next annual session will be held at the Hotel Statler, Boston.

Meeting of American Rheumatism Association.—The American Rheumatism Association will hold its annual meeting in St. Louis May 15 at the Chase Hotel, beginning at 9:15 a. m. All members of the American Medical Association are invited. Following the presidential address by Dr. Ralph Pemberton, Philadelphia, the program will be presented:

Dr. Francis C. Hall, Boston, Menopause Arthritis.
Dr. Richard H. Freyberg, Walter D. Block, Ph.D., and M. F. Frome, Ann Arbor, Mich., Study of Sulfur Metabolism and the Effect of Sulfur Administration in Rheumatoid Arthritis.
Dr. Louis Maxwell Lockie and Roger S. Hubbard, Ph.D., Buffalo, Observations of Effect of High Fat Diet in Gouty Arthritis.
Dr. J. Albert Key, St. Louis, Foreign Body Arthritis.
Drs. Marian W. Ropes and Walter Bauer, Boston, Origin and Nature of Normal Synovial Fluid.
Drs. Martin Henry Dawson and Ralph H. Boots, New York, Arthritis Associated with Lymphogranuloma Venereum.
Drs. Frances Baker, James F. Rinehart, Stacy R. Mettler and Frederick S. Bruckman, San Francisco, Rheumatoid Arthritis of the Spine.
Drs. Nathan Sidel and Maurice I. Abrams, Boston, Treatment of Chronic Arthritis: Results with Saline Injections Used as Controls for Vaccine Therapy.
Dr. John P. Stump, New York, Prevention of Arthritic Deformities by Early Orthopedic Management.

Report of the Commonwealth Fund.—During its twentieth year the Commonwealth Fund of New York appropriated \$2,277,953.19 for philanthropic purposes. More than four fifths of its expenditures went for the promotion of health, principally for medical education, research, public health and community hospitals in rural areas. The fund's endowment having been raised in 1937 to almost \$50,000,000, the appropriations for the past year were the largest it has ever made. The ninth rural hospital built by the fund was opened at Ada, Okla., during the year, and two others have been planned—one at Provo, Utah, and one at Lancaster, S. C. A new type of arrangement has been made with the Kings Mountain Memorial Hospital at Bristol, Tenn.-Va., by which the fund will finance modernization of the plant and provide resident medical service. In return, the community agrees to put the institution on a sound financial footing and bring its operation in line with accepted standards. Contributions to medical education through various channels amounted to \$375,000. A new plan in this field was to award fellowships to ten junior instructors

in medical schools for study in other institutions. Four junior staff men interested in pediatrics received fellowships to study psychiatry. Other new awards include subsidies to the departments of preventive medicine at New York and Long Island College of Medicine. Fifteen medical schools and hospitals received funds for medical research amounting to \$345,000. To some extent these funds were concentrated on groups of related studies at different centers. Oklahoma and Alabama were added this year to the states receiving assistance in support of rural public health service. In Oklahoma a state traveling unit to advise local health officers and a demonstration of county health work in Seminole County were made possible through the fund. In Alabama the state health department received aid in building up a health district of seven counties as a means of strengthening local service in various fields of local health activity. One of the major interests of the Commonwealth Fund is in mental hygiene and it has promoted this activity in England as well as in the United States. According to the report, these activities in the United States have three main objectives: to encourage exploration of the frontiers between psychiatry and other areas of medicine (particularly pediatrics); to increase the supply of trained psychiatrists and psychiatric social workers, and to promote and safeguard standards of clinical organization and service. The fund last year subsidized teaching clinics at the New York Hospital and the Babies Hospital in New York, Children's Hospital in Boston and the University of Minnesota, Minneapolis; it offered fellowships in psychiatry and psychiatric social work and maintained a national advisory service for community clinics in cooperation with the National Committee for Mental Hygiene. In England the fund continues to assist the London Child Guidance Center, an agency known as the Child Guidance Council and a training course for psychiatric social workers.

CANADA

Society News.—Dr. Edmund L. Keeney, Baltimore, addressed the section on medicine of the Academy of Medicine of Toronto January 10 on "Slow Epinephrine" and Dr. Alfred H. W. Caulfield on "Slow Epinephrine Inhalant."—Dr. Irvine McQuarrie, professor and head of the department of pediatrics, University of Minnesota Medical School, Minneapolis, addressed the Montreal Neurological Society at McGill University, Montreal, March 1, on "Physicochemical Studies on the Mechanism of Convulsive Phenomena."

Grants to University of Toronto.—A gift of \$250,000 from the Rockefeller Foundation toward an endowment for the school of nursing is announced by the University of Toronto. The department of medical research at the Banting Institute has received from the Supreme Council of the Scottish Rite Masons a grant of \$2,500 for research on the insulin and metrazol treatments for dementia praecox. A gift of 200 mg. of radium has been made to the department of medical research by Gilbert A. Labine of the Eldorado radium mines in memory of his son Leonard.

FOREIGN

Dr. Rous Lectures in England.—Dr. Francis Peyton Rous of the Rockefeller Institute for Medical Research, New York, gave the William Withering Lectures at the University of Birmingham, England, March 9, 16, 21 and 23, on the cancer problem.

Anniversary of Petrus Camper's Death.—The University of Groningen, Holland, announces a special meeting and exhibition April 29-30 to commemorate the one hundred and fiftieth anniversary of the death of Petrus Camper, a physician, anatomist, obstetrician and artist who for ten years was professor of medicine at the university. Camper died April 7, 1789. At the memorial meeting Saturday evening, April 29, addresses will be made by Dr. B. W. Th. Nuyens, Amsterdam, and members of the Groningen faculty. The exhibition will bring together anatomic drawings by Camper and a number of preparations made by him. The drawings are in the possession of the Library of the Netherlands Society for the Promotion of Medicine at Amsterdam and the University Library at Leyden.

CORRECTION

Immunization Against Pertussis.—In Miller and Faber's article in THE JOURNAL, March 25, page 1147, second column, first paragraph, line seven, the word "disease" should have been "exposure" and in the following line the word "from" should be deleted. In the second line of the third paragraph in the same column the word "atypical" should be "typical."

Government Services

Meningitis on the Navajo Reservation

An outbreak of meningitis on the Navajo Indian Reservation, which covers parts of Arizona, New Mexico, Colorado and Utah, is reported in a recent issue of the *Navajo Medical News*, bulletin of the Indian Medical Service for this reservation. The report covered the area served by the Indian Hospital at Shiprock, N. M. In twenty-seven suspected cases, the diagnosis was positive in thirteen, presumptive in twelve and negative in two. Twenty-six cases occurred in Navajos. Several of the patients had died before the physicians were notified and the diagnosis was made from descriptions of the symptoms. Of the twenty patients who were hospitalized, nineteen were in Shiprock hospital. There were thirteen deaths: five in the Shiprock hospital; one in San Juan Hospital, Farmington, N. M., and seven outside of hospitals. Most of the patients were children, the average age being 11½ years. A brief mention of this outbreak, based on a newspaper report, was published in THE JOURNAL January 28 under Utah news, page 343.

Medical Activities of the Veterans' Administration

The Veterans' Administration had 50,899 patients under hospital care at the close of the fiscal year ended June 30, 1938, an increase of 4,483 over the previous year, according to the annual report of the administrator. The largest proportion of these beneficiaries were hospitalized for neuropsychiatric diseases, 57.54 per cent; 9.64 per cent were under treatment for tuberculosis and 32.82 for general medical and surgical conditions. Of the total number of veterans, 76.32 per cent were receiving treatment for disabilities not of service origin.

Hospital admissions for 1938 were the highest of any fiscal year since 1919, when government facilities were authorized for care of World War veterans. There were 152,966, of which 91 per cent were for non-service-connected disabilities. They were divided as follows: 10,989 for tuberculosis, 10,750 for psychotic or mental diseases, 12,686 for other neurologic disorders and 118,541 for general medical and surgical diseases.

During the fiscal year 202,081 patients were under treatment; 149,956 were discharged after an average of 76.9 inpatient days. Deaths in hospitals totaled 10,117, or 6.75 per cent of the discharges. Of the total number of deaths, 6,620 occurred among patients with general conditions; about 36 per cent of these deaths were caused by diseases of the circulatory system including heart disease, and 33 per cent by malignant tumors and diseases of the digestive system. In addition, there were 1,979, or 19.56 per cent of all the deaths, from pulmonary tuberculosis, and 1,518, or 15 per cent of the total, from neuropsychiatric diseases.

Veterans present in domiciliary status in facilities under the control and jurisdiction of the administration totaled 14,254, an increase of 3,216 during this fiscal period. Of the entire number, 10,104 were disabled by medical and surgical conditions, 3,844 by neuropsychiatric diseases and 306 by tuberculosis. During the year there were 28,585 admissions for domiciliary care, of which about 90 per cent were for non-service-connected disabilities.

The Veterans' Administration was operating hospital facilities at eighty-one locations in forty-three states and the District of Columbia, with a capacity of 51,991 beds. There was an increase of 4,570 beds, of which 80 per cent was in beds for mental patients. At the close of the fiscal year construction was in progress on twenty-two major projects to provide 3,626 beds. Funds have been made available for 6,593 more beds. The administration also has 16,798 domiciliary beds and new construction will provide 2,158 more.

The net operating expense for all facilities totaled \$49,076,115.42 and the per diem rate for the year was \$2.65, as compared with \$2.81 in 1937.

Field facilities of the administration made a total of 1,128,587 physical examinations for outpatient purposes, of which 98 per cent were medical and 2 per cent dental. Treatments furnished during the year totaled 994,968, as compared with 895,208 the previous year. About \$400,000 was authorized for the purchase of orthopedic and prosthetic appliances, the largest item being \$122,000 for artificial legs.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 11, 1939.

The Protection of Physicians in Air Raids

In a debate in the House of Lords on air raid shelters, Lord Horder said that in the event of war no adequate security, physical or moral, could be afforded to those who continued to work in a dangerous area, except by some form of bomb-proof shelter. He had special reason for speaking, because one body must inevitably work in a danger zone—the physicians. An intensive air raid must paralyze for a time all activity, even on the part of physicians at a first aid station. Some thought that as many casualties as possible should be removed forthwith from the danger center to the less dangerous parts of the city, the periphery. But, owing to the congestion of thoroughfares and the blocking of streets by debris, many casualties would have to be treated at the point of origin and the physicians must be there to administer treatment. This was the whole meaning of a first aid station or hospital. He therefore entered a special plea that the first aid stations must be in some bomb proof place, and he could think of none adequate for this purpose except a deep underground shelter. At present 95 per cent of physicians were already enrolled by the British Medical Association for war work. The minister of health was now earmarking from that register those for special purposes. The number of these experts was limited, and the first air raids must count among their casualties a large number of physicians. He was not speaking on their behalf; he was speaking economically. They were valuable citizens and more valuable prospectively in the event of war. Their replacement was limited and, apart from that, their work would be possible only underground. Not only they but their valuable equipment, which would be difficult to replace in an emergency, must be in a place of adequate shelter. Replying for the government, Lord Birkenhead said that the question of underground dressing stations was under consideration. The problem of deep shelters was more complex than was supposed. None of the continental great powers had gone in for them on a large scale.

A Clinic for Criminals

That crime is often a medical problem has been increasingly realized in recent years. Dr. Norwood East, lecturer on crime and insanity at the Maudsley Hospital, and Dr. W. H. Hubert, psychotherapist at Wormwood Scrubs Prison, have in their official report recommended a new institution in which abnormal and unusual types of criminals can be given psychologic treatment. They have for four years been engaged in an investigation to determine how far psychiatric and psychotherapeutic experience in the management and treatment of psychotic and psychoneurotic illnesses and various forms of behavior could be applied with profit to prisoners of divergent types.

They investigated 406 prisoners, including boys with whom the Borstal system had failed, adolescent adults and a large group of sex offenders. Of these, 214 were treated psychologically. They concluded that 75 per cent of the Borstal boys, 55 per cent of the adolescents, 30 per cent of the adults and from 30 to 65 per cent of the sex offenders were suitable for the new institution. They suggest that this should serve as (1) a clinic and hospital for treatment by psychotherapy, (2) an institution for the psychiatric treatment of prisoners

who have not proved amenable to the reeducative and rehabilitating influences of the modern prison, (3) a colony for offenders for whom reformatory methods, however specialized, seem useless and the severity and hardships of prison life are not appropriate, and (4) an observation and treatment center for boys who, because of mental abnormality, appear unsuitable for Borstal training or have failed to respond to it. The medical staff should be psychiatrically trained, with additional experience in criminology, and the superintendent should be a prison psychiatrist. The inmates should not be insane or mentally defective and should not be encouraged to regard themselves as irresponsible mental invalids. Those who refuse to cooperate in treatment and abuse their privileges should be returned to prison.

Other recommendations of the report are extension of the use of psychotherapy on probation, but largely confined to first offenders, with the condition that the offender must reside for certain periods in a mental hospital or approved place. The investigation was confined to men and boys, but the investigators do not doubt that their experience justifies the appointment of a woman psychotherapist to a woman's prison and they recommend such an appointment.

PARIS

(From Our Regular Correspondent)

March 4, 1939.

Protamine Zinc Insulin in the Treatment of Diabetes

At the January 20 meeting of the Société médicale des hôpitaux of Paris, Dr. Raoul Boulin reported the following results of treatment with protamine zinc insulin in 100 cases of diabetes:

1. Glycosuria disappeared in seventy-four cases. In two of these, injections of ordinary insulin had also been given before meals. In the other seventy-two the glycosuria could be controlled with a dose of protamine zinc insulin which was only one sixth that of ordinary insulin. In eleven of the other twenty-six cases the blood sugar content was lowered about 50 per cent, but in fourteen cases the substitution of protamine zinc insulin failed to have any influence on the glycosuria. In the last-named group the diabetes was of a severe type, from 70 to 90 units daily of ordinary insulin being required to control the glycosuria. A better result might have been obtained in these fourteen cases if ordinary insulin had been given as an adjuvant before meals.

2. The blood sugar content before eating was brought down to normal in twenty-eight cases with doses of protamine zinc insulin varying from 16 to 50 units, about one fifth the dose of ordinary insulin. Of the other seventy-two cases, the blood sugar content was slightly above normal, i. e. from 1.25 to 1.5 Gm., in twenty-nine, between 1.5 and 2 Gm. in twenty-nine and above 2 Gm. in fourteen. In a total of ninety-six cases there was a lowering of the blood sugar content before eating, even though there was an average reduction of one sixth from the dose which, with ordinary insulin, would have given the same results. In four cases of severe diabetes the blood sugar content was distinctly higher after the use of protamine zinc insulin.

3. Local complications noted were painful nodules at the site of injection, which became ecchymotic at times. Such nodules were usually observed if the injections of protamine zinc insulin had been given too superficially. In addition to these nodules, pruritus, urticaria and a bullous eruption were seen. These local complications necessitated cessation of treatment in two cases.

4. General complications included in two cases headache so severe as to cause the treatment to be suspended. Symptoms of hypoglycemia were observed in nineteen cases. The syndrome usually appeared after midnight, in the milder form as nausea and profuse perspiration. In only four cases were convulsions and a comatose state noted, and response to treatment was rapid.

5. A sudden transitory increase in the severity of the glycosuria or a sudden drop in the blood sugar content, also temporary, was often noted.

6. An apparent failure to obtain good results with protamine zinc insulin is often due to the fact that the patient does not shake the ampule so that the insulin is well suspended in the solution. Other causes of failure which may be cited are injection into the muscular tissues instead of the skin and a too liberal diet.

7. Protamine zinc insulin is to be especially recommended for diabetes of moderate severity. In a certain number of cases of severe diabetes it has the advantage over ordinary insulin that it can be given not only in smaller doses but also in a single injection. In other cases of severe involvement, about 14 per cent of all in which ordinary insulin is indicated, the protamine zinc combination given alone and in a single dose has not given as good results as ordinary insulin given in several doses; hence it is advisable to employ both the ordinary and the protamine zinc variety.

Cerebral Complications Following the Use of Acetarzone

At the January 20 meeting of the Société médicale des hôpitaux of Paris a case was reported by Dr. Robert Worms in which cerebral symptoms appeared a few hours after introduction into the vagina of a tablet containing 0.25 Gm. of acetarzone. A woman aged 65 had been given such tablets as a remedy for leukorrhea. The treatment was resumed after a lapse of three months. About twelve hours after insertion of a tablet she felt nauseated and complained of a severe headache and the temperature rose to 103 F. The following day a generalized scarlatiniform eruption appeared. Despite repeated injections of epinephrine the headache became more severe, and forty hours later the patient became comatose after an epileptiform convulsion. The coma persisted for two days and was followed by rapid cessation of all symptoms. In a search for the cause of such a clinical picture it was found that twelve years before the patient had been given a series of injections of acetylarsan (a French proprietary preparation, p-oxy-acetyl-amino-phenylarsinate of diethylamine) for chronic intestinal parasitosis. Five days after the second injection severe headache, convulsions and coma appeared, which receded as rapidly as during the present attack.

Dr. Worms expressed the opinion that, as in the case reported by Laederich and his co-workers, the syndrome following the introduction into the vagina of such a relatively small amount of an arsenical preparation could be due only to an intolerance to such medication.

In the discussion the syphilologist Dr. Milian said that the pentavalent arsenical preparations so commonly employed at present are apt to give rise to the same complications as the trivalent arsenical preparations. The use of the pentavalent preparations can be followed by peripheral neuritis or neuritis involving the optic or auditory nerve in persons who have an intolerance toward all arsenical preparations. As to absorption from the vagina, in the use of arsenical preparations for syphilis, he had seen results from the use of vaginal suppositories as good as those which are generally obtained with oral or intravenous medication.

BERLIN

(From Our Regular Correspondent)

Feb. 20, 1939.

The New Medical Curriculum

The increased shortage of trained professional men in Germany has aroused a great deal of apprehension with regard to the younger generation. Certainly the educational programs have numerous disadvantages, the most egregious of which have been the late age at which training is completed and the still later age at which the professional man has found it possible to establish a family. Legislation to become effective April 1 has been framed with the purpose of correcting these disadvantages. The new law aims chiefly at a greater concentration of the curriculum and the avoidance of unnecessary waste of time. Revisions become necessary in the medical curriculum from time to time in order that the schools may keep pace with the advances of scientific knowledge; certain courses lose their importance and new courses of study must be accorded a larger place. Since the Nazi revolution, a whole series of reforms has been urged. The physician now is quite mature before he founds a family. The prospective doctor passes the examination for entrance to the university at the age of 18 (the earliest limit). At the age of 20 or 21 he has completed the compulsory labor service and military service required of all male citizens. There follow five and one half years of medical study and the year of undergraduate internship required of every medical student before he receives the final license. Meanwhile the young man has reached the age of 27 at least. If he wishes to specialize there follows a further period of special training, which averages five years. Most doctors are ultimately admitted to sickness insurance practice, but before becoming a panel practitioner a doctor must have had at least two years of general practice. Time spent in the study of a specialty is to a certain extent deductible from the period of preparation for panel practice. Accordingly a general practitioner is about 29 and a specialist about 33 before an independent practice can be begun.

The curtailment effected by the new legislation will amount to two years; it is accomplished as follows: 1. The regular curriculum is reduced from the present eleven to ten semesters (four preclinical and six clinical). 2. The year of internship, which at present must be served immediately after the student has completed his courses and passed the state examination, is incorporated within the undergraduate schedule. At specified times the medical student will serve under a staff physician as a "famulus" in a clinic or hospital. This arrangement has existed for decades on a voluntary basis. Hospitals must now adjust their routines to this new compulsory arrangement, which at the same time deprives them of the services of the graduate interns. For many institutions this loss of the "praktikanten" will be a severe blow since these men receive no remuneration and often perform valuable service. 3. Another half year will be saved by drastic abbreviation of the time required for taking the state examinations.

Despite these curtailments, several new compulsory lecture courses have been introduced into the curriculum at the instance of the national führer of physicians and the national führer of university instructors. According to official explanation of the innovation, "it must no longer be optional with the student whether or not he commits himself with regard to questions of vital importance to national life. The physician of the future must have an authoritative, fundamental knowledge of all these problems. In future less stress will be placed on the theoretical training than on the principle that theoretical knowledge and practical performance may be correlated in such a way that the present lack of practical ability will be a thing of the past." Whether through this new orientation

much will be lost that has helped to establish the reputation of German medicine the future will tell. The very foundations of this reputation may be menaced. Sad to say, the new curriculum represents a type of medical education the introduction of which has constantly been opposed by all intelligent medical groups. On the contrary, it cannot be denied that the reform legislation contains good points. For example, hereafter the courses in zoology, botany, chemistry and physics designed for medical students will be freed of a vast amount of detail which, while valuable to the student of natural science, is of no particular importance to the medical student. In the anatomy courses too the student will be spared certain excessive feats, such as the learning by heart of the nomenclature of the most minute vessels. Conversely, topographic anatomy will be given greater consideration.

The following items have been introduced into the preclinical curriculum: lectures on the history and nature of the art of healing, lecture courses in ethnology and policies regarding population (scheduled for the first semester, before the student can have formed any independent opinion with regard to these things), field trips in search of medicinal herbs, supplementary to the course in botany, six weeks of practice nursing (a real advance), a lecture course on the physiology of occupation, sports and aviation, and practical experience as a worker in a factory or on a farm. The excursions in search of medicinal herbs will of course further the new movements for natural therapeutics. The nursing service is to be performed between the second and third semesters; it is to show whether the student is psychically equal to contacts with the sick and whether or not he should continue in medicine. Factory service or farm service, lasting four weeks, will be interposed between the third and fourth semester. This means actual work as a farm or a factory hand; the requirement was initiated by public health headquarters of the Nazi party and is designed to aid the future practitioner to a better understanding of popular needs.

To the clinical part of the curriculum have been added courses in radiology, natural therapeutics, occupational diseases, treatment of traumatic injuries, child welfare, eugenics, dental diseases, genetics, forensic medicine and deontology. Several shorter lecture courses have been added and finally two three month terms as a *famulus* (between the sixth and seventh and the eighth and ninth semesters).

In professional quarters fears have been entertained that training under the new curriculum will be less complete than under the present curriculum. On the other hand, it is expected that the new plan will be "much more in accord with practical needs" and "more realistic." Henceforward the German medical student must work extra hard to assimilate his courses within a brief period. But it is already apparent that this high pressure type of training is being overdone and that the spirit of medical science, which ought to prevail, stands in danger of being badly damaged by overorganized curricular schedules. The youthful student should be allowed time in which to reflect on all the new facts learned in his courses and to make these an intimate part of himself. To do so he must have vacations and leisure periods, both of which are to be taken from him. Now he will be turned into a learning robot, hurried from one task to another.

There is no doubt that the lack of doctors must be made up as quickly as possible. Similarly a few weeks ago the prescribed minimal curriculum in all institutes of technology and kindred schools was abbreviated because of a shortage of engineers and other trained technicians, which is even more acute than the shortage of physicians. Although the ministerial decree of course does not say so, it is obvious that gaps exist in the ranks of German physicians as a consequence of

the exclusion of Jews from practice. The expansion of the defense forces has created an additional need for physicians for, without exception, besides the six months labor service, military service has to be taken for two years before the younger men can begin their medical studies. It will be several years before the new curricular reforms can exert perceptible influence on the serious shortage of doctors. Will the young physicians trained under a system that minimizes theoretical principles be able to carry the disciplines into the practice of medicine, as doctors have been wont to do? Will the doctors of the future be able to find their way among new phenomena and principles no mention of which was made in their studies, and will they be able to comprehend the unfamiliar? There is room for doubt. Is it possible that the imponderabilities are being irretrievably sacrificed to temporary political expediency?

AUSTRALIA

(From Our Regular Correspondent)

Feb. 14, 1939.

National Health Insurance Abandoned

The commonwealth government of Australia has now decided to abandon completely its scheme for national health and pensions insurance. In a determined effort to preserve the plan even if only in skeleton form, several alternative schemes less comprehensive in nature were considered, but the agreement to abandon the whole insurance act was reached today with only two members dissenting. The treasurer (Mr. R. G. Casey), who evolved the scheme and fathered it through parliament, has now emerged as one of the strongest advocates against it. Reasons advanced for this decision are fear that the financial burden involved may be so great as to stifle normal developmental expenditure if it is allowed to fall simultaneously with the heavy defense program to which the ministry is already committed, fear of the repercussions from the cost of insurance while the greater part of the commonwealth is suffering from the effects of severe drought and widespread bush fires, and a recognition of the fact that throughout Australia the act is highly unpopular and that its introduction against the wishes of the people may lead ultimately to grave political consequences.

The opposition to the scheme in the ministry itself, although strong when parliament adjourned in December, has increased immensely since. In the past two months, members of the cabinet have moved freely in their electorates and have in many cases been astonished at the intensity of public feeling against national insurance.

The abandonment of the scheme will cost the commonwealth government at least £750,000 and perhaps £1,000,000, according to estimates made by the National Insurance Commission. Large sums of money have been spent on the initial steps for its establishment and numerous "approved societies" have incurred heavy expenditures to cope with the new responsibilities which they were prepared to undertake. Already 156 such societies have been formed in Australia, sixty by trade unions, fifty-nine by friendly societies and thirty-seven by miscellaneous organizations; wages contracts have been entered into with staffs, and many men have left lucrative posts to take administrative positions with the government or with approved societies. The government has not yet considered whether the whole organization which it created will be disbanded immediately or whether it will be kept to form a nucleus for the proposed national register (for defense purposes). The British Medical Association in Australia has been opposed from the start to national insurance as proposed by the government. It is to be hoped that this abandonment of the present scheme will furnish an opportunity for drawing

up at some future date a scheme more universally acceptable, to be put into practice at a time when the nation is better prepared to handle developmental measures.

The Future of Pharmacy

That the future of pharmacy depends on its resuming its original primary function as handmaiden to medicine was the theme of an address by Sir Stanton Hicks, professor of physiology at Adelaide University, to the pharmaceutical section of the recent meeting of the Australian and New Zealand Association for the Advancement of Science. Recent advances in synthetic aids to therapy demand the application of expert chemical knowledge in the medical field, but the physician in his capacity as a practitioner cannot be expected to grasp the full significance of the intricacies of chemistry. He needs cooperation with a chemical assistant, who will be able to advise him concerning the value of new synthetic therapeutic substances and other therapeutic chemical advances. Sir Stanton Hicks said that the profession of pharmacy must come back to where it was before the split between the apothecary and the physician. But we are coming back along roads which could not be envisaged then.

With the development of specific medicinal reagents, for example chemotherapeutic substances, vitamins, endocrine products and immune serums, we are approaching a phase of rational specific nonsurgical therapy, for which the whole-hearted cooperation of the pharmacist must be enlisted and for which the pharmacist must be prepared.

Regarding the need for chemical guidance in the doctor's choice of new therapeutic substances, it is doubtful that any individual pharmacist could give a reasonable opinion on their value. General opinion in Australia favors the formation of a body comparable to the Council on Pharmacy and Chemistry of the American Medical Association.

Medical Survey of Children

The possibility that many children acquire uneven shoulders because of the overuse of their right hand and arm was discussed by Dr. E. A. Machin before the recent congress of the Australian and New Zealand Association for the Advancement of Science. Dr. Machin disclosed the results of a health survey of 16,777 children attending state schools in New South Wales. Of the boys examined 34.2 per cent had uneven or "dropped" shoulders. Such shoulders appear to be associated with the general uneven or one-sided development of the muscles of the shoulder girdle as the result of the overuse of the right hand and arm. Games like tennis appeared to overemphasize the difference between the two sides.

Of the children examined 77 per cent had slight or no medical defects, 20.4 per cent had remediable defects including marked dental defects, 1.9 per cent had permanent defects not seriously incapacitating, and 0.4 per cent had defects causing permanent serious incapacity. The posture was reported as good for 26 per cent, average for 43 per cent, below average for 26 per cent and poor for 4 per cent. The nutrition of 37 per cent was good, of 64 per cent average, of 8.3 per cent below average and of 2.1 per cent poor. These figures, however, are based on a purely arbitrary standard of classification and are apt to convey a false impression as to the state of nutrition of Australian school children.

Postgraduate Education in New South Wales

This year is marked by the establishment of a postgraduate school of medicine at the Prince Henry Hospital in Sydney. This hospital, which was reconstituted by act of parliament in 1936, has been divided into three departments, of medicine, surgery and pathology, each under the control of a director, and, although a number of students have been attached to the school during the past year, attention has been devoted mainly to developing the organization necessary for postgraduate work.

It will figure largely in the 1939 program of medical courses for graduates. Four important fellowships have been founded by the board of directors with the object of promoting postgraduate teaching in medicine and surgery in New South Wales, by enabling suitable graduates to obtain special experience in these fields, and also of encouraging and advancing research in medicine and surgery by systematized postgraduate instruction. A fellowship in anesthesia has been founded.

The New South Wales Postgraduate Committee holds a general revision course each year, which is brief and intensive and designed for general practitioners. Week end courses are held at various country centers; courses of a more special nature are arranged, and instruction for higher degrees and diplomas is provided.

Education for Physical Fitness

The coordinating Council of Physical Fitness at its recent meeting in Melbourne decided to ask the federal government to provide lectures in physical education at each of the Australian universities. The proposed scheme envisages a center in every state where young men and women may obtain instruction and training to qualify them for the instruction and training of others in physical fitness. In Australia there is a dearth of qualified persons in this field, and the primary task of any fitness campaign is to educate a team of potential instructors. The cost to the commonwealth government of the present proposals will be £12,000 a year. This will provide lecturers' salaries, the equipment of gymnasiums and the provision and upkeep of all facilities.

Oversupply of Medical Students

If the number of first year medical students at Australian universities remains constant, and there is every reason to assume that it will increase, one in every 250 young men and women in Australia will be embarking on a medical course. This proportion is absurdly high and must lead to an overloading of the medical profession. In comparison, one in 1,500 is entering the profession of dentistry, one in 600 the law and one in 800 engineering.

Money Spent on "Patent Medicines"

In an address on national health services at the seventh summer school of the Australian Institute of Political Sciences, Dr. T. L. Dunn, city health officer of Sydney, stated that the Australian public spends £11,000,000 annually on "patent medicines" and so-called cures. This represents an average annual expenditure of £2 a person.

Marriages

WESLEY DEE THOMPSON JR., Philadelphia, to Miss Catharine Gray Bennett of Wellsboro, Pa., Nov. 22, 1938.

HERBERT WILLIAM WALL, Los Angeles, to Mrs. Kathleen Petty Hudson in Dallas, Texas, in December 1938.

PRESTON HEPBURN WATTERS to Miss Mary Margaret Culbertson, both of Miami, Fla., in December 1938.

ARSHAK Y. YAZARIAN, Washburn, Ill., to Miss Satenig Siranossian of Bridgewater, Mass., August 14.

ST. JULIEN R. MURCHISON to Miss Lady Mildred Thomas, both of Fort Worth, Texas, Dec. 15, 1938.

RUSSELL C. WILLOUGHBY, Groves, Texas, to Miss Louise Latimer of Port Arthur, Oct. 12, 1938.

THOMAS B. TAYLOR, Douglasville, Ga., to Miss Carol Taylor at Powder Springs, in December 1938.

CHARLES STEPHEN WHELAN, Boston, to Miss Maria Elizabeth Hearn of Brooklyn, February 6.

LANDRUM TUCKER, Ripley, Tenn., to Miss Helen Roberts at Hot Springs, N. C., February 1.

HERMAN TURK, Lima, Ohio, to Miss Daphne Stout in Georgetown, Ky., February 13.

Deaths

John Bion Bogart ☉ Lower Granville, N. S., Canada; University of the City of New York Medical Department, 1884; an Affiliate Fellow of the American Medical Association; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; consulting surgeon to the Kings County, Jewish, Wyckoff Heights, Methodist Episcopal and Unity hospitals and the Brooklyn Home for Consumptives; aged 79; died, January 18, in the Memorial Hospital, Middleton.

Edwin Milton Beery ☉ Brooklyn; Bellevue Hospital Medical College, New York, 1897; senior surgeon to the Brooklyn Eye and Ear Hospital; consulting ophthalmologist to the Kingston Avenue Hospital and formerly director of eye service, Brooklyn Jewish Hospital; at one time assistant director of hospitals of New York City Department of Health; aged 67; died, January 30, in St. John's Hospital of heart disease.

Percival James Eaton, Provincetown, Mass.; Harvard University Medical School, Boston, 1888; member of the American Pediatric Society; on the staff of the Columbia Hospital, 1906-1918; past president of the staff of St. Margaret Memorial Hospital and on the staff of the Children's Hospital, Pittsburgh; aged 76; died, Dec. 28, 1938, in the Olean (N. Y.) General Hospital of carcinoma of the colon.

Jacob Treichler Butz ☉ Allentown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1900; secretary of the Lehigh County Medical Society and the Lehigh Valley Medical Society; president of the Lehigh County Tuberculosis Society; for many years county medical director; city health officer; formerly county coroner; aged 65; died, Dec. 22, 1938, of cerebral thrombosis.

Ernest Loyd Cartwright, Springfield, Mo.; St. Louis University School of Medicine, 1926; member of the Missouri State Medical Association; on the staff of the Springfield Baptist Hospital, and on the associate staffs of the Burge and St. John's hospitals, aged 37; died, Dec. 30, 1938, in the Missouri Baptist Hospital, St. Louis, of complications following a nephrotomy for kidney stones.

William Cantrell, Greenville, Texas; Arkansas Industrial University Medical Department, Little Rock, 1897; member of the State Medical Association of Texas; past president of the Hunt-Rockwall-Rains Counties Medical Society; formerly member of the state board of medical examiners; physician in charge of a hospital bearing his name; aged 67; died, Dec. 28, 1938, of heart disease.

Robert Henry Ash, Canastota, N. Y.; College of Physicians and Surgeons, Buffalo, 1883; Hahnemann Medical College and Hospital, Chicago, 1884; member of the Medical Society of the State of New York; formerly health officer; on the staffs of the Canastota (N. Y.) Memorial Hospital and the Oneida (N. Y.) Hospital; aged 81; died, Dec. 19, 1938, of coronary thrombosis.

Randolph Faries, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1888; at one time professor of physical education at the University of Pennsylvania; formerly physician-in-chief of the city department of public welfare; aged 76; died, Dec. 30, 1938, in the Graduate Hospital of pneumococcal lobar pneumonia and arteriosclerotic heart disease.

Chester M. Carlaw, Minneapolis; McGill University Faculty of Medicine, Montreal, Que., Canada, 1891; member of the Minnesota State Medical Association; fellow of the American College of Surgeons; surgeon to the Northwestern and Minneapolis General hospitals; aged 68; died, January 7, of coronary sclerosis and diabetes mellitus.

Philip Sheridan Goodwin, Perry, N. Y.; Western Reserve University School of Medicine, Cleveland, 1885; member of the Medical Society of the State of New York; for many years coroner and village health officer; aged 73; died, Dec. 13, 1938, in the Rochester (N. Y.) General Hospital of arteriosclerotic heart disease.

Ward Eugene Collins ☉ Kalamazoo, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908; member of the American Academy of Pediatrics; served during the World War; aged 55; on the staff of the Bronson Methodist Hospital, where he died, Dec. 31, 1938, of cerebral hemorrhage.

Vernon Alfred Gotcher, Lancaster, Pa.; University of Arkansas School of Medicine, Little Rock, 1931; member of the Medical Association of Georgia; formerly assistant professor of pathology at the University of Georgia School of Medicine, Augusta; aged 37; died, Dec. 2, 1938, of coronary occlusion.

Elbridge Arthur Carpenter, Passaic, N. J.; University of Vermont College of Medicine, Burlington, 1909; aged 56; died, January 1, in the General Hospital, Paterson, of purulent bronchiectasis and bronchopneumonia, following burns of the face received when he fell asleep while smoking.

Merchant C. Householder ☉ Pottsville, Pa.; Jefferson Medical College of Philadelphia, 1888; past president of the Schuylkill County Medical Society; on the staff of the Pottsville Hospital; aged 74; died, Dec. 17, 1938, of a dissecting aneurysm of the aorta and arteriosclerosis.

Elmer Ellsworth Bamford, Centerville, Iowa; College of Physicians and Surgeons, Keokuk, 1890; Rush Medical College, Chicago, 1893; fellow of the American College of Surgeons; on the staff of St. Joseph's Hospital; aged 72; died, January 6, in Appanoose of cerebral hemorrhage.

Christopher James Carr, Framingham, Mass.; Medical-Chirurgical College of Philadelphia, 1901; formerly member of the board of health; for several years school physician; aged 63; on the staff of the Framingham Union Hospital, where he died, Dec. 21, 1938, of chronic myocarditis.

John Dean Shipman, Vernon, N. Y.; Syracuse University College of Medicine, 1898; member of the Medical Society of the State of New York; served during the World War; formerly health officer and coroner of Vernon and Geneva; aged 63; died, Dec. 18, 1938, of heart disease.

James Rankin McCarrell, Pittsburgh; Jefferson Medical College of Philadelphia, 1883; member of the Medical Society of the State of Pennsylvania; aged 78; died, Dec. 12, 1938 in the Allegheny General Hospital of a skull fracture received when he was struck by an automobile.

Andrew Stephen Backus, St. Paul; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1905; member of the Minnesota State Medical Association; formerly deputy coroner; aged 57; was found dead, January 20, of carbon monoxide poisoning.

Amos Henry Baldwin, Pleasant Hill, Mo.; Hahnemann Medical College and Hospital, Chicago, 1890; member of the Missouri State Medical Association; past president of the Cass County Medical Society; aged 72; died, January 27, of pernicious anemia.

Richard H. Hutchings Jr., ☉ Wingdale, N. Y.; Syracuse University College of Medicine, 1919; member of the American Psychiatric Association; on the staff of the Harlem Valley State Hospital; aged 44; died, Dec. 14, 1938, of coronary occlusion.

Emerson Joel Lindsay, Walled Lake, Mich.; Detroit College of Medicine and Surgery, 1927; member of the Michigan State Medical Society; formerly member of the health department of Detroit; aged 43; died, Dec. 25, 1938, of coronary occlusion.

Norman Olaf Dalager, Anamoose, N. D.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; member of the North Dakota State Medical Association; aged 60; died, Dec. 27, 1938, in a hospital at Minot.

James Edgar Doig, Endicott, N. Y.; Albany (N. Y.) Medical College, 1899; member of the Medical Society of the State of New York; county coroner; aged 63; died, Dec. 31, 1938, in the Ideal Hospital, of cerebral hemorrhage and hypertension.

Gustaf Hugo Johnson ☉ Savannah, Ga.; Long Island College Hospital, Brooklyn, 1898; county coroner; served during the World War; on the staff of the Warren A. Candler Hospital; aged 67; died, Dec. 28, 1938, of acute dilatation of the heart.

Leroy Cholula Goff, Clarksburg, W. Va.; University College of Medicine, Richmond, 1906; member of the West Virginia State Medical Association; formerly county coroner; on the staff of St. Mary's Hospital; aged 60; died, Dec. 22, 1938.

William Brown Thistle, Toronto, Ont., Canada; L.R.C.P., University Medical Department, Coburg, Ont., 1886; formerly associate professor of clinical medicine, London, 1887; formerly associate professor of clinical medicine, University of Toronto Faculty of Medicine; died, Dec. 17, 1938.

Charles Lincoln Bliss, Washington, D. C.; University of the City of New York Medical Department, 1891; member of the Medical Society of the District of Columbia; formerly a medical missionary; aged 73; died, January 21, of cerebral thrombosis.

John Thomas Davis, Liberty, Kan.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1879; member of the Kansas Medical Society; formerly county health officer; aged 85; died, Dec. 26, 1938, of chronic myocarditis.

Richard August Morgner, Fitchburg, Mass.; Tufts College Medical School, Boston, 1902; member of the Massachusetts Medical Society; for many years on the staff of the Burbank Hospital; aged 65; died, Dec. 27, 1938, of diabetes mellitus.

Henry Herbert, Los Angeles; Medizinische Fakultät der Universität Wien, Austria, 1891; at one time associate professor of physical diagnosis at the College of Physicians and Surgeons, Los Angeles; aged 72; died, Dec. 15, 1938, of heart disease.

Charles Le Baron Ⓢ Gulfport, Miss.; Medical College of Alabama, Mobile, 1889; past president of the Harrison County Medical Society; on the staff of the King's Daughters' Hospital; aged 70; died, Dec. 11, 1938, of chronic nephritis.

Joseph Thomas Brennan Ⓢ Grandview, Mo.; St. Louis University School of Medicine, 1908; county health officer; served during the World War; aged 56; died, Dec. 31, 1938, in St. Joseph Hospital, Kansas City, of coronary thrombosis.

Peter M. Campbell, Elgin, Ill.; Detroit College of Medicine, 1891; member of the Illinois State Medical Society; on the staffs of St. Joseph's and Sherman hospitals; aged 78; died, January 17, of lobar pneumonia and chronic myocarditis.

James Percy Powell, Mangham, La.; Arkansas Industrial University Medical Department, Little Rock, 1896; aged 70; died, Dec. 5, 1938, in Vicksburg (Miss.) Sanitarium, of arteriosclerotic heart disease and chronic nephritis.

Frederick Durand Davis Ⓢ Springfield, Mass.; University of Vermont College of Medicine, Burlington, 1910; served during the World War; on the staff of the Mercy Hospital; aged 54; died, Dec. 31, 1938, of coronary thrombosis.

Charles Henry Root Ⓢ Bassett, Neb.; University of Nebraska College of Medicine, Omaha, 1903; aged 62; died, Dec. 14, 1938, in the Methodist Hospital, Omaha, of retroperitoneal abscess and chronic cholecystitis.

Aaron Thomas Colley, Enterprise, Ala.; University of Louisville (Ky.) Medical Department, 1894; member of the Medical Association of the State of Alabama; aged 69; died in December 1938 of coronary thrombosis.

Joseph Henry Boyles, Greensboro, N. C.; College of Physicians and Surgeons, Baltimore, 1903; veteran of the Spanish-American War; on the staff of the Piedmont Hospital; aged 65; died, January 24, of lymphosarcoma.

Albert Smith Parker, Clinton, Wis.; Northwestern University Medical School, Chicago, 1901; member of the State Medical Society of Wisconsin; aged 69; died, Dec. 10, 1938, in Sawtelle, Calif., of arteriosclerosis.

Alexander Rudolph Chillag Ⓢ Buffalo; Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása, Budapest, Hungary, 1918; aged 45; died, Dec. 20, 1938, of arteriolar nephrosclerosis and hypertension.

George Wesley Blanchard, Pelham, N. Y.; Medical School of Maine, Portland, 1895; consulting physician to the United States Military Academy at West Point; aged 70; died, January 17, of coronary thrombosis.

Omer Rocelus Alexander, Winter Haven, Fla.; Atlanta Medical College, 1893; member of the Florida Medical Association; aged 66; died, January 25, in Dunedin of coronary occlusion and thrombosis.

Ole Hansen Berg, Chicago; College of Physicians and Surgeons of Chicago, 1896; on the honorary staff of the Norwegian-American Hospital; aged 71; died, January 8, of diabetes mellitus and hypertension.

Arthur Wesley Thomas, Salem, N. Y.; Albany (N. Y.) Medical College, 1904; for many years health officer of Jamaica, Vt., and school director; aged 61; died, Dec. 17, 1938, in Brattleboro, Vt., of myocarditis.

David A. Hewit, Spokane, Wash.; John A. Creighton Medical College, Omaha, 1904; member of the Washington State Medical Association; aged 57; died, Dec. 27, 1938, at Santa Ana, Calif., of arteriosclerosis.

Wilson Canfield, Eaton Rapids, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; aged 79; died, January 8, of arteriosclerosis, diabetes mellitus and chronic myocarditis.

Thomas Willett Bishop Ⓢ South Pasadena, Calif.; Bellevue Hospital Medical College, New York, 1895; medical director and owner of the Pasadena Sanitarium; aged 68; died, Dec. 28, 1938, of cerebral hemorrhage.

Chester C. Impey, Omaha; John A. Creighton Medical College, Omaha, 1903; on the staffs of the Lutheran and St. Catherine's hospitals; aged 58; died, Dec. 11, 1938, in Oakland, Calif., of heart disease.

Charles Pelton Hutchins Ⓢ Syracuse, N. Y.; Long Island College Hospital, Brooklyn, 1897; served during the World War; aged 66; died, Dec. 28, 1938, of coronary thrombosis and cerebral embolism.

John Lockwood Baker Ⓢ Brooklyn; Long Island College Hospital, Brooklyn, 1905; for many years member of the city health department; aged 61; died, January 4, in the Swedish Hospital of pneumonia.

Julius A. Fowler, Malakoff, Texas; Louisville (Ky.) Medical College, 1892; formerly county health officer and member of the state board of medical examiners; aged 69; died, Dec. 5, 1938, of bronchiectasis.

Albert F. Merrell, Hallstead, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1888; member of the state legislature; bank president; aged 72; died, Dec. 2, 1938, of carcinoma of the prostate.

Alexander Lane Brobeck, Hoopeston, Ill.; University of Louisville (Ky.) Medical Department, 1885; member of the Illinois State Medical Society; aged 85; died, January 16, of cirrhosis of the liver.

Henry Delapierre White, Lancaster, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1887; aged 72; died, Dec. 2, 1938, of coronary thrombosis.

Mark Duane Gundrum Ⓢ Westville, Ill.; Loyola University School of Medicine, Chicago, 1916; served during the World War; aged 49; was found dead, Dec. 25, 1938, of coronary thrombosis.

Willis E. Stewart Ⓢ Stratton, Neb.; Central Medical College of St. Joseph, Mo., 1900; medical director and owner of a hospital bearing his name; aged 63; died, Dec. 30, 1938, of chronic myocarditis.

Harvey William Marvin, Washington, D. C.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1897; aged 64; died, Dec. 17, 1938, of cerebral hemorrhage and chronic myocarditis.

Albert Mason Tyler, Long Beach, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1886; aged 80; died, Dec. 11, 1938, of diabetes mellitus and cerebral thrombosis.

John Sheridan Arnold Ⓢ Washington, D. C.; College of Physicians and Surgeons, Baltimore, 1896; for many years school medical inspector; aged 73; died, January 6, of cerebral hemorrhage.

William Allan Taltavall Ⓢ Redlands, Calif.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1885; aged 79; died, Dec. 22, 1938, of coronary disease.

Richard Alexander Peters, Tipton, Iowa; Rush Medical College, Chicago, 1884; aged 75; died, Dec. 11, 1938, in Chicago of hypernephroma of the left kidney with metastasis to the pubic bone and pelvis.

Arthur Morris Cohen Ⓢ Philadelphia; University of Pittsburgh School of Medicine, 1925; aged 38; died Dec. 26, 1938, in the Mount Sinai Hospital, Cleveland, of coronary arteriosclerosis and thrombosis.

Walter B. Weaver, Cincinnati; Medical College of Ohio, Cincinnati, 1890; member of the Ohio State Medical Association; formerly county coroner; aged 70; died, Dec. 14, 1938, of arteriosclerosis.

Joseph Roop Smith, Marydel, Md.; University of Pennsylvania Department of Medicine, Philadelphia, 1887; aged 72; died, Dec. 24, 1938, in the Kent General Hospital, Dover, Del., of pneumonia.

Charles L. Ackerman, Brownstown, Ind.; Kentucky University Medical Department, Louisville, 1903; member of the Indiana State Medical Association; aged 71; died, January 4, of pneumonia.

Monroe F. Clouser Ⓢ Oley, Pa.; Medico-Chirurgical College of Philadelphia, 1907; aged 55; died, Dec. 6, 1938, in St. Joseph's Hospital, Reading, of coronary occlusion and diabetes mellitus.

John Henry Rumpf, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1896; aged 76; died, Dec. 1, 1938, of heart disease.

John Clyde MacDonald, Edmonton, Alta., Canada; Halifax (N. S.) Medical College, 1895; aged 70; died, Dec. 28, 1938.

Ezra A. Haist, Ottawa, Ont., Canada; University of Toronto Faculty of Medicine, 1895; died, Dec. 12, 1938.

Correspondence

ANATOMY OF SPHINCTER

To the Editor:—In THE JOURNAL February 18 an article by Blaisdell refers to my work on the anatomy of the anal sphincter and the etiology of fistula. After reading Dr. Blaisdell's article several times I feel that both he and the discussor, Dr. Hill, have overlooked several important points in my work and that they have failed to correlate certain age-old clinical observations with actual anatomic manifestations. Some of these observations are that:

1. There is a definite relation between the internal and external orifices of a fistula. A fistula having its external orifice situated behind a plane passing transversely through the center of the anus usually has its internal aperture in the posterior commissure of the anus at points corresponding to 5 or 7 on the clock, the posterior median line being considered as 6 o'clock.

2. A subcutaneous fistula has its external opening within 1 inch of the anus and the internal opening external to Hilton's white line.

3. In submuscular fistulas the internal opening is usually between the sphincters.

The explanation of these observations is contained in my article on this subject published in *Surgery, Gynecology and Obstetrics* in May 1931. It demonstrates that the course of fistulous tracts does not follow the intermuscular septum but, in those cases in which the fistula passes into the ischiorectal fossa, the internal opening corresponds to the points at which the vessels traversing the ischiorectal fossa enter the submucous region of the anus, namely 5 and 7 o'clock posteriorly.

The external longitudinal coat of the large intestine is at best a rather weak structure. Some of the fibro-elastic terminations of this coat of the bowel pass through the internal sphincter to the submucous region caudad to the muscularis mucosae; others pass between the layers of the external anal sphincter muscle to insert into the cornified skin around the anus, and still others insert into the levator ani muscles. These observations are clearly portrayed in my article on Hilton's white line in the *Annals of Surgery* of July 1935. Dr. Blaisdell has apparently made the same mistake as many other workers in this field who have considered the anatomy from the observations made on surgical specimens and autopsy material instead of the living patient. An accurate picture of the relationship of the various muscles cannot be obtained after death because the muscles are relaxed and do not maintain their normal positions. Hilton emphasized this fact when he referred to his white line as being present "in the living." When the sphincters are contracted the external sphincter is caudad to the internal sphincter, which is the thickened termination of the inner circular coat of the rectum. The strongest coat of the intestine, as every surgeon knows, is the submucous coat. This is the coat which is used in the making of catgut. It is also the coat through which the surgeon likes to have his intestinal suture pass in order to secure firm union. This fact was emphasized by Halsted and Gross. Microscopic study of the anal region discloses that the thick fibrous area described by Milligan and Morgan and quoted by Blaisdell as the intermuscular septum is really a much thickened submucous layer.

Although the anatomy of the external sphincter muscle of the anus does follow a certain general pattern, it varies so greatly in individual specimens, as disclosed by my studies, that it cannot account for the more or less constant location of the internal opening of the fistula.

The points raised by Blaisdell on the subjects of cutting the muscles during operations on a fistula, the dangers of dilating the rectum, the physiology of the sphincter muscles and the observations made on palpation of the anus are all discussed in my articles already cited.

ROBERT I. HILLER, M.D., Milwaukee.

COINS COMMEMORATING PHYSICIANS

To the Editor:—In THE JOURNAL, Aug. 27, 1938, page 863, Dr. E. F. Kiser stated that he knew of no coin bearing the portrait of a physician other than the one struck by Austria in 1929 commemorating Theodor Billroth.

Lithuania in 1936 commemorated Dr. Jonas Basanavicius on a 5 litas silver coin, and Brazil in 1937 struck a 400 reis nickel coin with the portrait of Oswaldo Cruz.

I should be glad to hear from interested physicians if other such coins have been issued by any country.

L. GRANT GLICKMAN, M.D., Minneapolis.

A SIMPLE METHOD OF PLASMA TRANSFUSION

To the Editor:—The intravenous administration of blood plasma is recognized as a rational procedure in the therapy of secondary shock resulting from loss of blood plasma and consequent increase in concentration of the blood, as in crushing injuries and burns. Although whole blood transfusions are of therapeutic value in these conditions, the red cells serve no useful purpose and tend to prevent the rapid correction of increased blood viscosity. It can be said, with possibly some reservation, that plasma transfusion also appears to be logical in hypoproteinemia resulting from the combination of starvation and parenteral administration of crystalloid solutions in the treatment of acute abdominal disease.

"Lyophile" serum (Flosdorf and Mudd, *J. Immunol.* 29:389 [Nov.] 1935) has been developed for use in these conditions and has received clinical trial. Unfortunately the preservation of human blood serum in dry form is complex and costly and its development has not yet been carried to a point at which it can be used without the fear of reactions or contamination.

This brief communication is to point out that human plasma is available safely, immediately and cheaply to any one who has access to a blood bank. Stored blood, standing at rest in the refrigerator, separates into plasma and cell layers. During the past six months in the Department of Surgery and Gynecology of the University of Virginia Hospital we have employed the supernatant plasma in cases of shock presenting increased blood concentration and in cases of hypoproteinemia from starvation. In the former group of cases the results have been satisfactory. In the latter group a larger series of cases than ours will be needed before the results can be appraised. The principle is presented therefore only as a suggestion for a method of treatment, obviously safe and theoretically logical.

Whole citrated blood transfusions are given at the University of Virginia Hospital by the closed method, a single flask for collecting, storing and delivering the blood being used. The supernatant plasma can be obtained by aspiration. A sterile glass tube attached to the negative pressure collection apparatus which is used in obtaining blood from donors is carefully inserted in the storage flask and the plasma layer is sucked over into a flask, which is then used to deliver the plasma to the recipient.

The underlying precautions as to typing, cross matching, serologic study and storage period of the blood to be used for plasma transfusion are observed just as though the whole blood were to be employed. The matching must be perfect in both directions—i. e., donor's plasma vs. recipient's cells and recipient's plasma vs. donor's cells—and must be carried out just before use of the plasma. The plasma should be administered immediately after collection in order to avoid bacterial growth from minor degrees of possible contamination from the air. With the precautions used it is obvious that the spilling over of a small portion of the cell layer will not create danger. Nor will it defeat the major purpose of the procedure.

The red cell layer remaining in the donor flask may also serve a useful end. In a number of instances, after proper additional

matching, the erythrocytes suspended in salt solution have been given to patients with anemia. The value of this procedure is as yet undetermined, but it would seem to be logical in cases of hemolytic sepsis in which the essential problem in repeated transfusions is the replacement of red cells and not of plasma.

It is presumed that these simple procedures have occurred to many others dealing with bank blood. In the rapidly growing literature on the blood bank, reference to them has not been encountered.

EDWIN P. LEHMAN, M.D., University, Va.

Department of Surgery and Gynecology,
University of Virginia Hospital.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

POLIOMYELITIS VIRUS

To the Editor—Kindly advise me regarding the following with reference to poliomyelitis: 1. How is the presence of a virus in nasal washings or in stools determined? Has any other method than injection of monkeys been devised? 2. It is stated that there are numerous types of the virus (of poliomyelitis) with different characteristics. How has this been determined? 3. How is it possible to determine whether or not antibodies exist in serum?

M.D., Alabama

ANSWER—1. The virus of poliomyelitis is detected in nasal washings or stools by processing the material submitted for the test. Such material is then tested for infectivity by intracranial inoculation in susceptible monkeys. The technique used in preparing this material is that of suspension in a suitable aqueous menstruum with filtration through a bacteria-tight filter, followed by concentration of the fluid medium to a small volume by distillation in vacuo. There is no test for the presence of poliomyelitis virus other than the inoculation test in monkeys.

2. The viruses of poliomyelitis can be defined by two means: (a) immunologic properties and (b) variable effect following inoculation into monkeys. The immunologic methods that have been used to define the poliomyelitis virus are the insusceptibility of animals to cross inoculation and cross protection tests. The differences in individual properties of the virus include a different mortality rate and extent of paralysis as produced in experimental animals.

3. The means of determining the presence of antibodies in serum are the following. Each serum is tested by mixture with a standard infectious dose of virus and incubated in vitro at 37 C. The mixture is then tested for infectivity in monkeys. If the mixture produces the disease in animals, the serum is said to contain no protective antibodies. These tests may also be carried out on a quantitative basis.

FROHLICH SYNDROME

To the Editor—A boy aged 15 presents a typical picture of Fröhlich's syndrome. Reports regarding the value of pituitary substance in these cases vary widely. What is the best accepted treatment? The patient's chief complaint is perspiring, especially on the hands. Physical examination is entirely negative except for blood pressure of 148 systolic 88 diastolic. What would cause perspiration, granted that it is not due to a nervous cause? How can I reconcile it with pituitary disturbance?

J. J. ZONE, M.D., Wayland, N. Y.

ANSWER—Opinions vary regarding "the typical picture of Fröhlich's syndrome." This description is often applied to boys who are simply too fat and whose sexual development is somewhat delayed. Many of these boys "straighten around" with a little patience and a weight reduction regimen. Williams studied a large group of boys of this type who were admitted to an English school and found that 87 per cent of them became normal spontaneously. This does not mean that the boy described does not have Fröhlich's syndrome; it simply suggests the need for caution in making this diagnosis. It should be added that this "typical syndrome" is found also in many boys who are mentally deficient. Hecker and Warren report many such examples.

Assuming that this patient has Fröhlich's syndrome, there are at least three hormones which may be tried:

1. Pituitary gonadotropic hormone. This hormone, obtained directly from the pituitary, has not been tried in enough cases to warrant any conclusion.

2. Pituitary-like gonadotropic hormones. These have been used more extensively. They are obtained from sources other than the pituitary—usually from the urine of pregnant women or the serum of pregnant mares. They resemble the true pituitary gonadotropic hormone in most ways but probably originate in the chorionic villi and not in the pituitary. The horse serum has not been utilized sufficiently to draw conclusions and has the usual disadvantages associated with the use of any horse serum. The hormone from the urine of pregnant women has been used most frequently but not always in well selected cases and the results are not always evaluated in a critical fashion. In the case mentioned this hormone might be tried. The dosage has varied, but 500 or 1,000 units two or three times a week for ten to twelve weeks should constitute an adequate trial period. A note of caution is not out of order. Thompson and Hecker reported several cases of marked enlargement of the genitalia from the use of this hormone.

3. Testosterone propionate. This may be the method of choice. Testosterone propionate is the male hormone in its crystalline form. A recent article by Kenyon has reviewed this subject and reports some interesting cases. If this hormone is to have any effect in the case described it should manifest itself after a period of from ten to twelve weeks' treatment, the patient being given 25 mg. of testosterone propionate hypodermically each week.

The inquirer does not mention the patient's basal metabolic rate. If this is low, he may need thyroid extract. In any event he should follow a weight reduction regimen although both of these suggestions may affect the interpretation of improvement if endocrine substances are used. The single blood pressure reading may not be significant; it should be checked every hour for twenty-four hours. It probably is not related to the Fröhlich syndrome. The sweating is of questionable significance and may disappear with improvement in the patient's general condition.

References:

- Williams, Pearce: The Imperfectly Migrated Testis. Some Statistical Data, *Lancet* 1:426 (Feb. 22) 1936.
Hecker, A. O., and Warren, V. C.: Girdle Type Adiposity Among Mentally Deficient Males, *Am. J. Dis. Child* 54:1257 (Dec.) 1937.
Thompson, W. O., and Hecker, N. J.: Piecemeal Sexual Development from an Anterior Pituitary-like Principle, *THE JOURNAL*, May 28, 1938, p. 1813.
Kenyon, A. T.: The Effect of Testosterone Propionate on the Genitalia, Prostate, Secondary Sex Characters and Body Weight in Eunuchoidism, *Endocrinology* 23:121 (Aug.) 1938.

COLD ABSCESSES OF OLD AMPUTATION STUMP

To the Editor—A World War veteran aged 47 suffered multiple wounds of his right leg and thigh and underwent a mid thigh amputation in 1918. As the result of infection, healing was delayed for more than a year. Since 1920, however, he has worn a prosthesis without trouble, except for the removal of two small bits of shrapnel in 1930. Since early in 1937 two small localized, discrete masses about the size of chestnuts have appeared subcutaneously on the anteromedial aspect of the thigh 2 inches below the inguinal ligament just distal to the rim of the prosthesis. The masses disappear spontaneously as a rule after two or three weeks and then recur in four or six weeks. They are quite tender. In September 1938 one mass developed into a small "cold" abscess, which was aspirated for examination, then incised. It promptly healed, and the other mass disappeared. Both recurred a month later and disappeared after incision of the abscess. Today, Nov. 21, 1938, I find both have recurred for the third time. The man's general health is excellent. The bacteriologic examination revealed "an acid fast bacillus resembling the tubercle bacillus." The patient had a negative Mantoux test in a dilution of 1:500 of old tuberculin. He has no lymphatic enlargement, his red count, white count and differential counts are normal, and his Wassermann reaction is negative. X-ray examination of the stump reveals no disease of the bone nor any shadows of shrapnel. Could this be caused merely by irritation of the artificial limb, although it apparently fits perfectly? Could smegma brevis gain entry through apparently healthy skin and cause such a condition? Is this condition common among men wearing artificial limbs? Any suggestions you may offer as to cause and treatment will be greatly appreciated.

JOSEPH C. ANDERSON, M.D., Ebensburg, Pa.

ANSWER.—It is probable that in this case the irritation of the artificial limb plays but small if any part. It would seem that this is most likely a tuberculosis of the skin. An attempt should be made to confirm this by further stained slides at the time of the next abscess. Possibly a guinea pig injection would be of use. General measures to improve the man's health, as in tuberculosis elsewhere, should be of value, and when there is any suspicion that one of the abscesses is forming the artificial limb should not be worn.

BODY ODOR

To the Editor:—A patient, white, single and 21, has never been ill. The family history is negative. The menstrual history is normal. Beginning about two years ago this girl noticed a peculiar odor like coffee about her person. This lasted for about an hour or so and then disappeared. Her friends notice it also. The odor does not come from her mouth and appears at irregular times with no apparent relationship to meals or menses. It may occur while she is working or while she is out with friends and it has become most embarrassing. Physical examination, including examination of the urine, is completely negative. The diet has not influenced the condition. Could you possibly suggest a cause and line of treatment?

M.D., New York.

ANSWER.—The study of body odors aroused considerable interest among the dermatologists of former days but nothing has been found in the medical literature of the last several years. The public is now particularly alert in this respect as the result of the insistent advertising of commercial products designed to correct or overcome such odors.

Odors may originate from (1) gas escaping from the bowel without the knowledge of the person, (2) bad breath, (3) discharge from the ears, (4) vaginal discharge, (5) decomposing sweat, sebum or urine on the skin or clothing, or (6) the peculiar odor of freshly secreted sweat. The query seems to rule out all except the last cause. Certain foods and drugs are credited with producing sweat of a peculiar odor. Alcohol, coffee, various ethers, garlic, valerian, asafetida and other gum resins, angelica, truffles, musk, turpentine, tar, sulfur, benzoic acid, iodine, iodides, phosphorus, zinc phosphate and copaiba are listed as having this power.

Nervous influence is also credited with the production or alteration of the body odor. There are many reports dealing with neurotic or hysterical individuals who emanate peculiar odors, pleasant or the opposite, during attacks. Fraud must always be suspected. In the case under consideration, an effort should be made to check the claims of the patient and her friends. She should be examined for a possible parosmia due to organic or functional nervous disease.

If it can be determined that the odor is in the sweat, the axillae may be dabbed frequently with from 1 to 5 per cent solution of salicylic acid in alcohol or from 1 to 5 parts of "solution of formaldehyde-U. S. P." and alcohol to make 100 parts. Potassium permanganate 1:3,000 in water may be applied as a wet compress or 1 per cent solution of the same drug may be painted on once a day. Applications about the genitalia must be made with more care. If there is any hyperhidrosis, x-rays filtered through 1 mm. of aluminum, 70 roentgens once a week may be given until the abnormal sweating is checked. If this is not possible, 25 per cent aluminum chloride in distilled water may be dabbed on once every third day and allowed to dry on. No soap should be used immediately before its application, and it must be allowed to dry completely before the clothing is put on. This is too apt to irritate to allow its use in the anogenital region.

The patient must be told repeatedly that others do not notice the odor as she does and that she must not allow herself to indulge in worry over it, for an olfactory neurosis is most difficult to overcome.

STUTTERING

To the Editor:—In May 1938 a woman aged 25, unmarried, a school teacher, was taking 1 grain (0.065 Gm.) of plasmochin daily. After two or three days she developed circumoral and ocular bluish discoloration, abdominal pain, shortness of breath, stuttering and hoarseness, anorexia and constipation. After about two months of tonics (iron, quinine and strychnine) she recovered in all respects except the stuttering. This has remained and becomes worse when she is tired. I will appreciate any comments both as to further treatment and as to the prognosis. Treatment so far has been nothing more than tonics, fresh air and exercise.

WATSON WHARTON, M.D., Smithfield, N. C.

ANSWER.—The patient should begin by taking some short verse and sounding a note over each word, starting the word with a low note and reaching the middle of the word with the octave and then coming down to the low note again on the remainder of the word. This should be practiced for three periods a day, each period being fifteen minutes long and one of the periods occurring before she retires for the night. After the patient can do this note with ease it can then be applied in her conversation over any word in which speech difficulty arises. The idea is to build for the time being a melody control over the speech, since it is impossible to stutter in the melody area. After two or three weeks of practice she may then pick out another short verse and use the note over the whole line instead of each word. To illustrate: In the line "This is the forest primeval" she should start the low note on *this* of the word *this* and reach the octave on the *i*, drawn

out and the *s*, coming down slowly on the rest of the sentence. This second note is then applied in the conversation after it has become easy in place of the first note. Then for the third step another verse is chosen and the note is so applied that the octave is reached in the middle of the sentence. For example, in the line quoted the octave would be reached in the syllable *for* of the word *forest*. The fourth step is to choose a verse which has pictures easy to visualize and learn it and picture the object for which the word stands as that word is uttered. After considerable practice the patient may then make up stories of ten lines or so of something she has seen and can picture easily. When skill has been developed in doing this, the mental picture of the word can be applied in conversation and the note discarded. Fresh air, exercise and rest are all helpful. At the stated age, with careful and faithful practice it would probably take about six months for recovery, perhaps much less, depending on the severity of the disturbance.

LOSS OF SPONTANEOUS MICTURITION AFTER HYSTERECTOMY

To the Editor:—A woman aged 26 was submitted to a subtotal hysterectomy for relief of menorrhagia. Immediately after the operation she voided urine twice. Ten weeks has now elapsed and catheterization has been necessary all the time. Distention of the bladder causes no distress and she cannot void voluntarily. There was nothing out of the ordinary about the operation and no perineal work. The Kahn reaction was negative and urologic examination gave negative results. How common is such an occurrence and what is the recommended treatment?

F. E. BOLLAERT, M.D., East Moline, Ill.

ANSWER.—Difficulty with reestablishment of spontaneous urination occurs most frequently in those cases in which there has been considerable mobilization or denudation of the bladder, with impairment of the nerve supply. In this case the question arises as to whether the bladder was stripped downward from the uterus for a considerable distance. If the patient is otherwise normal, a return of the power of spontaneous micturition is to be awaited with confidence.

A helpful procedure is daily distention of the bladder with sterile water, a rubber catheter and a 50 cc. or larger syringe. The bladder is filled until the patient complains of discomfort; then it is emptied through the catheter. On succeeding days the procedure is repeated, always with avoidance of producing excruciating pain, yet with the intent of ironing out folds and creases sufficiently to induce the return of function. "Distention treatment" has yielded gratifying results in nearly all cases in which there has been a persistent loss of bladder tone.

Except in patients with organic nerve lesions, persistent lack of tone is of extreme rarity, seemingly limited to patients with marked myasthenic symptoms.

TREATMENT FOR DRY SCALP—VITALIS

To the Editor:—What medication would you suggest for a dry scalp? Is "Vitalis" injurious to the scalp or beneficial? Is castor oil or olive oil satisfactory?

M.D., Washington, D. C.

ANSWER.—In all probability the underlying factor producing a dry scalp is seborrhea, of which there are two types. In one variety there is excess oil and this is accordingly termed "oily seborrhea." The other type of seborrhea is the dry type, or "seborrhea sicca." The principal characteristic of this is a dry scaling scalp. The scales themselves may be oily. The hair and scalp are lusterless and the latter is of a grayish hue. There may be moderate itching. In the treatment of all types of seborrhea, sulfur stands first. Among other useful agents are resorcinol, salicylic acid and mercurials such as the ammoniated and the bichloride. It is best to begin with pomades and after improvement of the scalp continue with lotions, which are more elegant and are more appreciated by the patient. The treatment should be continued for a relatively long time, because seborrhea is essentially a chronic disorder. Castor oil and olive oil may be used on the scalp but preferably in combination with some of the agents mentioned. Olive oil may be useful as a shampoo in certain types of seborrhea.

The Bureau of Investigation of the American Medical Association reports that it does not know what "Vitalis" contains. It has received reports from at least two physicians that irritation followed the use of "Vitalis." In June 1937 the Federal Trade Commission at Washington reported that it had obtained a promise from the Bristol-Myers Company to stop representing that its hair tonic, Vitalis, retards falling hair, unless limited to indicate excessive falling hair; that the product, combined with a massage treatment, brings new life and looks to the hair by giving it a chance to grow at the roots and scalp, and that it contains oils that hair requires for health.

GABRIEL'S SOLUTION FOR PRURITUS ANI

To the Editor:—Can you furnish me with information as to the composition of Gabriel's solution, used in the treatment of pruritus ani by injection, its method of use and the rationale?

MARION W. HESTER, M.D., Americus, Ga.

ANSWER.—Gabriel uses two solutions in the treatment of anal pruritus: (1) a 3 per cent solution of ethyl aminobenzoate (anesthesin) with benzyl alcohol (5 per cent) and ether (10 per cent) in sterilized olive oil, and (2) a solution composed of nupercaine (0.5 per cent), benzyl alcohol (10 per cent) and phenol (1 per cent) in sterilized oil of sweet almond. He prefers to give a few large injections rather than a series of small ones. He states that a large initial dose of 10 cc., which is injected about the posterior half of the perianal region, is the most significant feature of the treatment. No injection should be given in the presence of acute, moist dermatitis. A 10 cc. syringe is filled with one of the solutions and a needle 3 cm. in length is attached. The perianal skin is prepared in order to produce as nearly as possible a condition of asepsis. The injection is given through four punctures posterior to the anus. In this region is located the principal sensory distribution to the anus (the inferior hemorrhoidal nerve and the perineal branch of the fourth sacral nerve).

At each puncture 2.5 cc. of the solution is injected in a fan-like manner, and the needle should be inserted deeply so that no surface swelling is noticeable at the conclusion of the injection. Abrasions and excoriations about the anal margins should receive local treatment with medicated solutions, ointments and dusting powders.

A second injection of 10 cc. is given from five to seven days after the first. At the time 5 cc. of the solution is distributed by two punctures in relation to the right anterior quadrant and 5 cc. in relation to the left anterior quadrant.

A third injection of 10 cc. is given a week later. These injections are made "on each side of, and posterior to, the anus. The needle is passed forward in the subcutaneous tissues parallel to the surface, 5 cc. being injected on each side."

Thus a total of 30 cc. of the oily anesthetic solution is given. He warns that careful aseptic technic should be used and says that the best results can be obtained if the patient rests in bed for two or three weeks during the time the treatment is being given. Usually in twenty-four hours after each injection the patient notices a feeling of numbness which lasts for from three to six weeks, and during this time Gabriel emphasizes the importance of local treatment. He says that the solution of nupercaine and oil produces more pronounced anesthesia but believes that it does not last any longer than that produced by ethyl aminobenzoate. He has not found that abscesses have occurred in any of his private or hospital patients and has calculated that for about two thirds of his patients the results have been good. Gabriel: *The Principles and Practice of Rectal Surgery*, London: H. K. Lewis & Co., Ltd., 1937.

MULTIPLE FETUSES AND PLACENTA

To the Editor:—Are there any data with regard to twin births in which there are one and also two placentas? Do children attached to a common placenta and formed by what appears to be bifurcation ever differ in sex? When each child (fetus) is possessor of its own placenta of course one will admit that there were two ova fertilized at one time, but when there is but a single placenta one suspects that only one ovum was impregnated and that it bifurcated and formed two fetuses. Is it a fact that the mother of the Dionne quintuplets at their birth was delivered of only three placentas and that two of those were bifurcated, indicating that only three ova were involved in the generation? My experience in delivering twin births with the fetuses attached to a common placenta is that they are universally of the same sex, which goes to show that the sex of the fetus is determined before or immediately after growth begins from fertilization of the spermatozoon.

T. H. STANDLEE, M.D., Mirando City, Texas.

ANSWER.—Twins who have had a single placental attachment may or may not be of the same sex. Such a placenta may be the result of a fusion of two separate placentas. It is almost impossible, and according to several authors absolutely impossible, to determine by an examination of the placenta whether twins are the result of a single ovum or of separate ova. Detailed microscopic examination may be of some value, but gross examination is of no value. About 5 per cent of monozygotic or single ovum twins have distinct amnions and chorions. Twins arising from the same ovum are always of the same sex. Those arising from separate ova may or may not be. Sex is determined immediately on fertilization of the ovum and is dependent on the spermatozoon.

The famous quintuplets are monozygotic, all having originated from a single ovum. This fact has been definitely determined by a careful study of their finger-print patterns and other characters. At the present time this method of study is the only

reliable way of determining whether multiple births arise from a single ovum. Dr. Dafoe had little opportunity to study the placenta of the quintuplets before it was destroyed, but it was his impression that it consisted of a single large placenta.

Reference:

Newman, Horatio H.; Freeman, Frank N., and Holzinger, Karl J.: *Twins: A Study of Heredity and Environment*, Chicago, University of Chicago Press, 1937.

LIME DEPOSITS FROM WATER AND WATER SOFTENING

To the Editor:—Our water supply has a high mineral content, particularly calcium, which deposits around the cooling system of the engines used to generate electricity, causing excessive heating. To counteract this a thick liquid called "Sandbaum" made by the Sandbaum Company of Fort Worth, Texas has been used. It is called a vegetable colloid and claim is made that it removes lime deposits without chemical action. It costs \$15 for 8 ounces, which lasts about one month. Do you have any information on this product? It seems to me that there are chemical water softeners which would be much cheaper than this. Do ordinary water softeners prevent the deposit of lime on instruments and cooking utensils?

L. W. FORNEY, M.D., Mason City, Neb.

ANSWER.—Without knowing the exact chemical characteristics of the water used it is not possible to advise relative to the economics of water treatment and softening for the plant. Waters having calcium bicarbonates in solution will, of course, precipitate the calcium carbonate when the carbon dioxide, which serves to hold the carbonate in solution, is driven off with heating. As a rule where the quantity of water used for condensers is large and the dissolved solids high, water softening by chemical treatment or by passing the water over zeolites is more economical and satisfactory than batch treatment by various chemicals of a colloidal nature. It would probably be prudent and good economy to consult a qualified industrial chemist with regard to this problem.

NODULAR FIBROSITIS

To the Editor:—I should like information on the nature of the small nodular masses frequently palpable over the sacro-iliac synchondroses. They are smooth, rounded, variable in size, firm in consistency, overlying the joint. I find them more often in women, and they appear to be present in cases of both infected and apparently not infected joints. Although they feel like enlarged lymph nodes, I am inclined to think that they are cartilaginous bodies. Have they any significance?

V. E. POWELL, M.D., Atlanta, Ga.

ANSWER.—Small nodular masses, frequently palpable over the sacro-iliac synchondroses, are most often present in patients who have a general ligamentous relaxation not only in that region but throughout the body. This condition is often present around the time of the menopause, when the metabolic processes are at a low ebb and the patient presents a picture of extreme fatigue with lumbar lordosis and poor posture in general. The masses are similar to, if not identical with what has been called nodular fibrositis, which also may be present about the shoulder region and in the muscles or ligaments of the upper dorsal spine between the blades of the scapulae.

They have been examined microscopically, following excision, and consist of extremely edematous, fibrous, connective tissue. The cause is thought to be a low grade chronic inflammation, probably not on an infectious basis. They are present in many instances when chronic strain or stretching of the superficial ligaments exists. It is probable that any type of chronic irritation in the presence of poor muscle tone and poor venous circulation return predisposes to the development of these nodules. Such nodules may be expected to disappear when the posture is improved and the muscle tone, strength and circulation are restored to normal.

SCARLET FEVER IMMUNIZATION

To the Editor:—What is the present status of scarlet fever immunization? Should one recommend that all children be given the five doses of scarlet fever toxin? I have not felt that there has been enough evidence to warrant the universal use of the scarlet fever toxin.

M.D., Illinois.

ANSWER.—Inoculation of toxin according to the Dick method for the prevention of scarlet fever is not universally accepted without question. Pediatricians as a rule do not recommend the routine use of this procedure. Only those subjects shown to be susceptible on the basis of a positive Dick reaction should be injected with Dick toxin for the purpose of immunization. Usually a susceptible person who has received the five regular doses of Dick toxin does not develop clinical scarlet fever if exposed to the disease. However, immunization against streptococcal infections is not established. The Dick plan for scarlet fever immunization is carried out in many hospitals and other institutions, where it is of undoubted value.

PRURITUS FROM WATER

To the Editor:—A married woman aged 28 complains of an annoying pruritus, i. e., a generalized itching on her body only after taking a bath. If she washes clothes or dishes she has itching only where the water touches her. When water splashes on her chest when she is bathing her baby the spot where the water touches her body itches. This pruritus occurs regardless of whether she uses soap or not or whether the water is cold or hot. She is fastidious, taking baths at least once daily, often twice daily. Restricting the use of water, i. e., bathing herself, gives her comparative freedom from itching in between bathing. The use of soothing ointments after bathing does not lessen the itching. She is a moderate hyperthyroid, having a basal metabolic rate of +29, but under medical care her pulse has come down from 115 to 92 and her nervousness has improved greatly. She has no palpable thyroid and no exophthalmos. The urine, Wassermann reaction and blood counts are all negative. What can be done for this woman? Is it possible to desensitize her? Can a cause be found for this itching? Is there anything that can be given to allay her itching after bathing?

THOMAS MESSINA, M.D., Newark, N. J.

ANSWER:—The cause of ordinary bath pruritus is the drying of the skin caused by soap and water and by the dry winter air outdoors and the dry air of heated dwellings. It should therefore be more pronounced in winter than in summer. The case described is an extreme one, probably because of the slight hyperthyroidism. Desensitization is hardly to be hoped for. The itching can be modified or perhaps avoided by using soap and water only on the hands and face, the feet and the body folds. Then the patient should take a colloid bath made with bran, oatmeal or starch. This should be tepid and after it the skin should be dabbed gently until nearly dry, then anointed with 10 per cent boric petrolatum, with rose water ointment or other ointment, or with a lotion, such as the following, originated by Dr. William Allen Pusey:

	Gm. or Cc.
Liquid petrolatum	120.0
Oil of rose geranium	
Oil of bergamot	
Oil of lavender	0.1 or more as desired
Sodium benzoate	2.0
Powdered tragacanth	16.0
Water	to make 1,000.0

Phenol to 1 per cent may be added if desired, or any other antipruritic such as solution of coal tar.

The colloid bath is made of bran or oatmeal from 1 to 3 pounds to a 30 gallon bath, boiled for a few minutes in a gauze bag, to keep it out of the drains. This bag and the water in which it has been boiled are stirred about in the bath, and the bag gently squeezed. The starch bath is simpler, for no precautions need be taken to keep it out of the drains. It should be stirred up with cold water until it swells and then placed in the bath. The temperature of the bath water should be about 100 F. so that it may soothe, not stimulate. The patient should be taught that baths are not needed so frequently in winter as in summer, for the skin has less opportunity of becoming dirty.

AMMONIA AND RESPIRATORY SYSTEM

To the Editor:—I should appreciate an answer to the following hypothetical problems, all of which have medicolegal significance: 1. Could the exposure to fumes of ammonia gas in a man aged 54 light up a latent or quiescent tuberculosis? 2. What are the effects of ammonia gas on the respiratory tract? 3. It has been stated that ammonia gas never reaches the lungs. Is this a correct assumption? If so, what is the mechanism that prevents the gas from entering the lungs?

M.D., New York.

ANSWER:—1. Possibly yes, if the exposure to ammonia led to purulent catarrhal tracheitis, hemorrhagic bronchopneumonia, peribronchial pneumonia, pulmonary abscess or any prolonged injury of severe nature to the lower respiratory tract. Tuberculosis is not a common result.

2. Ammonia gas chiefly attacks the membranes of the upper respiratory tract, leading to edema, which edema may be delayed. Through reflex action, ammonia attacking the membranes of the upper respiratory tract may lead to cardiac dysfunction, paralysis of the respiratory center in the brain, convulsive movements and the like. Action on the lower respiratory tract is the same, although less ammonia may reach this portion of the respiratory system.

3. When concentrations of ammonia are high, spasm of the glottis prevents the entry of much ammonia into the trachea. On this account ammonia is commonly classed as an "irrespirable" gas. However, under some circumstances some ammonia may reach the bronchi and bronchioles. It may be doubted that any ammonia as such leaves the terminal air sacs and possibly none leaves the ultimate bronchioles. The reason for this is that the ammonia, immediately on contact with surface tissues, is chemically combined. The action of ammonia within the lung is localized exclusively, or almost exclusively, along the bronchial tree.

Council on Medical Education
and HospitalsANNUAL CONGRESS ON MEDICAL
EDUCATION AND LICENSURE

Thirty-Fifth Annual Meeting, held in Chicago, Feb. 13 and 14, 1939

(Continued from page 1288)

DR. JULIAN F. DU BOIS, Sauk Centre, Minn., in the Chair

THE FEDERATION OF STATE MEDICAL
BOARDS

FEBRUARY 14—MORNING

Does Medical Licensure Procedure Conform to the
Accepted Standards of Medical Education?

DR. A. C. FURSTENBERG, Ann Arbor, Mich.: The principal objective of medical education is the preparation of men and women for the practice of medicine. It must constantly change with the advent of new knowledge and new demands of service. It is impossible to prepare a curriculum which possesses permanent values. Growth and improvement in methods of teaching are imperative, with adjustments based on the changing social needs of medical service, and I doubt that medical education is keeping pace.

One hears dissatisfaction expressed on the count that premedical education deals with abstruse learning and has wandered far from its original purpose. Thirty years ago the premedical course was established to give the student a broad general education before he commenced the study of medicine. I doubt that this objective now dominates the picture. Analysis of the premedical curriculum discloses that it is composed largely of specific science subjects. The addition of numerous science studies has pushed the cultural ones out into the periphery of the curriculum. Students contemplating the study of medicine intuitively seek the science subjects, believing that they offer the best preparation for the study of medicine, and frequently they are urged by educators to take advanced courses in biology and chemistry in order that they may start medical education on the highest possible scientific level. I know of several arts colleges where premedical students are urged to study the anatomy, embryology, biochemistry and physiology of man. Such a program, which includes medical subjects, defeats the purpose for which premedical education was designed. Instructors in medical schools complain of this plan, arguing that it taxes their strength and patience to repair the damage done the students by instruction in basic medical sciences presented from the standpoint of the academician rather than from that of the doctor of medicine. Such a program robs the premedical curriculum of its cultural subjects and deprives the student of his only opportunity to obtain a broad general education before he commences to study medicine.

I urge that greater flexibility in the premedical curriculum be promoted, that it be made less stereotyped and that it be opened up liberally to cultural subjects so that it will give the student a wider range of interests. The term premedical is an unfortunate one. It should not represent a course specifically preparatory to the study of medicine. It should give the student a mature intellect and a well disciplined mind and prepare him for any professional study in which he may wish subsequently to engage.

If the present plan of premedical education fails to fulfil its purpose, the burden of criticism does not all rest with the medical schools. Some of it can be charged to the boards of registration. It is to be remembered that the boards have prescribed certain specific science requirements. They have written them into the laws governing the licensure of physicians, and the physician must present credits in these courses before he is certified for the practice of medicine. What about the student who has not pursued the science courses who

decides at the termination of four years of college that he wishes to study medicine? His predicament is most discouraging, because he finds the doors of the medical school closed to him. He is told that he has made his decision too late, that he should have known that he wanted to study medicine when he entered the freshman year in the arts college and that his only recourse is to return to the literary school for two more years of work in the sciences. I am wondering whether a decision of this character absolves the educator from further obligation to the student. Is the student to be penalized for withholding judgment on a matter of such vital importance as his life's work until he has graduated from the arts college at the age of 21? I have interviewed college graduates with excellent scholastic records who have decided that they wished to study medicine but were considered undesirable candidates by admissions committees because they had not completed the so-called premedical curriculum. Many of these students have been striking personalities, brilliant in their college accomplishments and equipped with a broad cultural education but destitute of the science credits which have been prescribed by law and required by medical educators.

All of which leads me to appeal for a less rigid, less stereotyped premedical curriculum, one that will give the student a broad general education before he commences the study of medicine. If the physician finds a knowledge of physics, chemistry, botany and zoology essential to the practice of medicine, then let no one interfere with the present premedical curriculum. If he can get along, as I do and as many of my colleagues do, without a speaking acquaintance with these subjects, then may I beg that a searching consideration be given to a problem of vital importance to the medical profession.

The second cause of dissatisfaction expressed by medical practitioners and the leading educators pertains to the work in the medical school itself and the methods of presenting it to the students. There is a conspicuous lack of integration of the fundamental sciences and clinical medicine. The time honored system of medical training thrusts the student into two years of arduous study of the basic sciences and then abruptly transfers him to a study of the practical clinical problems in the hospital. In short, there is a wide gap between the basic sciences and clinical medicine; the former are divorced from the latter, with the result that seniors and recent graduates are woefully deficient in a knowledge of the fundamental sciences. This plan is open to criticism when one recalls that half of the period of medical training has been devoted to a study of preclinical subjects. The trouble rests in failure to correlate the basic sciences and clinical medicine. It is futile to expect the student to retain a working knowledge of anatomy, for example, if he is divorced from the subject at the termination of the freshman year in medicine. The introduction of some genuine practical problems into the early years of medical training, and the pursuit of the fundamental sciences not for a greater number of hours but throughout the four year period of medical education in close association with clinical and preventive medicine, would mean that on the day of graduation the student was equipped with a knowledge of the basic sciences as serviceable as his knowledge of general surgery or internal medicine. Let us not be consumed by the ambition to recruit academicians and theoreticians from the student body. Let us focus on our objective, that of preparing men and women for the practice of medicine.

What then are the common interests of medical education and the state boards' procedure for licensure? A study of the boards' questions which serve as an index of the examiner's estimate of the young graduate's professional capabilities is revealing. Three distinct types of questions are usually in evidence: (1) the formal memory question, not expected to elicit a practical answer; (2) the less rigid academic question, which calls for both a theoretical and a practical answer and reveals a comprehensive and well integrated knowledge of the problem, and (3) the technical question, which calls for an immediate practical answer on the mechanics or technic of some particular method or procedure.

The following question is an example of the first type, the formal memory question: Define: (a) *plica vascularis*; (b)

vitelline duct; (c) *urachus*. What is the student going to do with this question? The answer is "nothing" unless he was fortunate enough to turn accidentally, the night before the examination, to the chapters in his textbook which described these terms. An example of the second type of examination question is "Sketch heart and blood vascular system." Here is a question referring to a subject which was commenced in the anatomy course of the freshman year, elaborated on later in the study of physiology, treated sedulously in the pathology courses of the sophomore and junior years and firmly impressed on the minds of the students in their cardiology of the senior year. What will be the character of the student's response? The answer is "good." Here is a subject which was kept alive throughout the medical curriculum; as it progressed from one year to the other, the student acquired interest and understanding and enjoyed the enlightenment derived from a correlation of theory and practice. As a result the material did not fail of lasting recognition at the termination of the senior year. The student's answer to this question reflects in large measure the extent to which he was trained in the medical school. An example of the third type of question is "Describe the technic of lumbar puncture." Even though this question may be a fair one, I doubt that it has a place in the examination of a student who has just completed his senior year in medicine. To perform a lumbar puncture involves mechanical skill, and the mere knowledge of how it should be done falls short of teaching the student how to do it. This operation requires supple and dexterous hands, which can be trained only by experience. Knowing how to do it is not sufficient; the performance demands exercise, which in the present program of medical education has been left to the practical opportunities of the intern year. An intern service in an accredited hospital is one of the legal requirements for practice in many states, and it would seem wise and expedient to delegate the responsibility of teaching technical procedures to the residents and house officers charged with the duties of postgraduate medical education.

Another problem of mutual interest to the boards of registration and the medical schools deals with the medical practice law which requires the student to present a diploma from a recognized college of medicine which has as a minimum requirement a four year course of eight months in each calendar year. This precludes the possibility of utilizing medical credits obtained in a graduate school or acquired in several summer sessions until it is certified in the office of the registrar that the student has been regularly enrolled in a medical school a full academic period in four calendar years. The student who transfers from the curriculum of public health and preventive medicine and the doctorate of philosophy to the medical school is not permitted to use the medical credits acquired in these fields until he has been registered in his school of medicine for the period prescribed by law. This legal requirement has some serious aspects. The extra expense of tuition and maintenance often imposes a severe financial burden on the student. He seeks advanced work in certain courses but is not always favored by the kind of studies best suited to his needs and interests; he dissipates his time and efforts in byways which do not lead in the direction of his objective; in short, he loses his motivation and finally, in despair, is content to make the best of a period of intellectual decadence until time permits him to take his examinations.

I recognize the magnitude of this academic problem, that it is peculiar to most forms of education, but in determining the qualifications of the doctor let us not overlook his training and preparation in the sociological and humanitarian aspects of medicine. Students today are abysmally lacking in these essentials of practice: a knowledge of human conduct and behavior, an understanding of mental and physical reactions to the emotional influences of life, and an appreciation of the variable human capacities for enduring pain and sorrow and resisting adversity and despair. All these factors comprise the very essence of medical practice. Does the medical student know that most of the practice which he anticipates will consist of patients experiencing some social, economic, moral or religious

conflict, that their physical ills will be a reflection of some emotional state and that drugs and operations will not cure them? From the beginning of premedical education until graduation, and beyond, the training of the doctor is predominantly in the organic sciences. A pain in the head is the result of sinus disease, brain tumor or cerebral arteriosclerosis, and if the student cannot find an organic basis for the headache he loses interest and passes on to his next assignment. No one has ever attempted to impress on him that the headache, in all probability, is due to an emotional conflict as important as an organic disease. Medical education has overlooked and is still overlooking this tremendously important field of medicine.

Examination Results Before Massachusetts State Board of Registration in Medicine

DRS. E. A. KNOWLTON, Holyoke, Mass., and STEPHEN RUSHMORE, Boston: The medical practice act of Massachusetts differs from the acts of all the other states. It provides for one board of seven physicians to examine and license persons who wish to practice the art of healing. There are no secondary boards, such as there are in many states, to license osteopaths, chiropractors, neuropaths, homeopaths, eclectics and whatnot to practice their respective cults. There are two boards which might be considered nonprofessional, one in optometry and the other in chiropody, but persons who wish to treat the sick must be licensed by the one board, the State Board of Registration in Medicine. Excluded from this board are physicians who are in any way a part of a faculty of a medical school, and a majority of the board members may not be members of any one chartered medical society. But the great difference between the Massachusetts act and the acts of other states is the requirement that any graduate from a legally chartered medical school must be accepted for examination. As a result Massachusetts is a great gathering place for graduates of the so-called nonapproved schools, who outnumber those from the approved schools about two to one. A great majority of these applicants fail in the examinations but still they come, year after year.

I have been making a statistical study of the end results of the Massachusetts examinations for 1937 and have prepared charts to present the results. The board is compelled by law to conduct examinations by the conventional written tests and to examine in seventeen subjects. As a result of my study I think that all the schools approved by the Council on Medical Education and Hospitals of the American Medical Association are graduating physicians equally well prepared to care for the sick and to deal with the health problems of the country. It is hard, however, to draw comprehensive conclusions. It is apparent that persons in the highest ranking fourth from the nonapproved schools are better qualified to meet a written examination than those in the lowest ranking sixth from the approved schools. The Massachusetts board has been condemned by the profession at large for licensing so many graduates from nonapproved schools. It has been as severely criticized by the officers of some of the approved schools for the high number of failures among their graduates. The question has often been asked, and I know the board members have often asked one another, whether the 26 per cent of applicants from nonapproved schools who have been licensed are better qualified to practice than the 18 per cent of graduates from the approved schools who have failed to pass and have not been licensed. There are, however, far too many applicants from both types of schools who receive exactly 75, a minimum passing mark.

I am not proud of the method of conducting examinations, which treat far too many subjects. The board members are not teachers or research workers. When the legislature changes the medical practice act so that the educational background of the applicants may be considered and some practical or oral test of their qualifications to practice may be used, the results of the examinations will not be so far out of step with those in other states.

DISCUSSION ON PAPERS OF DR. FURSTENBERG AND DRS. KNOWLTON AND RUSHMORE

DR. J. EARL MCINTYRE, Lansing, Mich.: Dr. Furstenberg has expressed excellent ideas. I have been of the opinion that premedical requirements are dogmatic and biased, too severe. I believe that the work leading to the bachelor's degree in liberal arts is as important as preparing the boy or girl for the medical school, if not more important, because I believe that it provides a broader background, better cultural education. Boards that have the power to fix a standard of both premedical and medical education should give thought to this point. I think that in the future changes which would be for the benefit of the coming generation should be considered.

DR. ERWIN SCHENK, Keokuk, Iowa: The program of medical education has not crystallized; it is so large that no one has caught up with it. The teaching force is not prepared to give the basic science work, and the deans are not high enough to coordinate the work that is going on in their institutions. Some of the latter aim to improve the situation by adding more years of study, but many students are like pitchers—you fill them full and whatever more you pour into them runs over the top. It will be necessary to exercise much more care in the acceptance of applicants by medical schools. The capacity is about so much in too many persons. The best way to cull such persons is to grade the colleges.

DR. A. S. BEGG, Boston: The deans are in a difficult position. They are pushed from below by the attitude of the colleges; they are pushed on one side by the faculty and its demands and on the other side by the student and his wishes, and they are pushed from above by the qualifying examinations. The correlation mentioned by the first speaker is being attempted in many places. In Boston University School of Medicine, clinical correlation exercises are started in the first year. A good many exercises are given in connection with the preclinical sciences by clinicians, who use the information the student has acquired to show him how it applies in medicine. There was an exercise not long ago called *eighteen hearts*. That happened to be the number of subjects in the dissecting room. The eighteen hearts were brought to the amphitheater, a pathologist rendered a report on each one and then a cardiologist discussed the results of the pathologist's examination. In one case the pathologist said "I suspect that you are going to find small kidneys." The instructor's job after the exercise was to keep the students from going in and taking out the kidneys to see whether he was right. In an exercise on the genito-urinary system the instructor told the students about roentgenograms that show double ureters and explained these on an embryologic basis; the students went back into the laboratory and were much interested in studying the very thing that they had been studying the preceding week, because here was a man who was making his daily bread by knowing such facts. I am not much worried about the waste of time on the part of the brilliant student. He finds other things to do. I have seen few who have been adversely influenced by long exposure to the medical curriculum. When one looks at the results of the examinations in Massachusetts, one is amazed and realizes the weakness of the whole system. I should like to recommend to the Federation of State Boards that it appoint a subcommittee to study the technique and content of state examinations, because I think they are very uneven. It is too bad that in Massachusetts so many persons must be examined in the course of a year. I hope that in 1941 this will be changed a little, but at the same time there ought to be legal provision for a really practical examination of those who come up for licensure.

DR. F. H. MAGNEY, Duluth, Minn.: You have heard the law and the setup in Massachusetts. Let me briefly state the setup in Minnesota. A basic science board eliminates a large number. Candidates for the medical board are mostly University of Minnesota graduates. The university I think has about 600 applicants each year, from which about 100 are selected. The university works well with the medical profession and the Minnesota State Medical Association, so its methods of teach-

ing are much in accord with medical practice. The other candidates are men who are working in the Mayo Foundation at Rochester, which is affiliated with the university. They come from the university medical schools of this country and Canada and they also are a picked group. About the only older men, who have been out of school for any length of time, are men who are put on the faculty of the university. The state board has the discretion of stating what types of candidates or what schools are recognized, as compared with the Massachusetts board, by which any school which is legalized or licensed must be recognized. Minnesota recognizes only class A schools. It is a question whether the board should be too critical in its examinations when the candidates are of such high caliber. A candidate is failed occasionally, but there is no reason why the percentage should be high.

DR. L. J. KOMINSKY, Texarkana, Ark.: I was glad to know that Massachusetts confesses its shortcomings from the medical standpoint. I find through my experience on the state board that there are two branches in which the students are quite lacking, *materia medica* and therapeutics. Every day the physician is confronted with detail men who know nothing about medicine but who tell him how to treat disease with the remedies put out by their houses. If every doctor had in his office the U. S. Pharmacopeia, the National Formulary and New and Nonofficial Remedies, he could find out whether the preparation in question was in one of these three. If a preparation is not, it should be let alone. I have told that to the young men before the state board in the past two years. In Arkansas, after a lot of tribulations, a basic science board has been established. I want to say for the University of Minnesota that last November one of its graduates, who is now a captain in the Army and Navy General Hospital, made the highest grade that has been made in Arkansas in the past eight years.

DR. G. M. WILLIAMSON, Grand Forks, N. D.: The remarks made by the last speaker are very apt. The universities are not teaching *materia medica* and therapeutics. Dr. Furstenberg's paper is one of the best I have ever heard. The university medical schools are teaching too scientifically and are not practical enough. The board in North Dakota examines only a small number, and the men are fairly well known before they come up for examination. A candidate either satisfies the board or doesn't satisfy the board. Even if he makes 90 or 95, if he is not the right type to turn loose on the public, he is so notified. One of the best men ever examined, as far as grades were concerned, it would have been a crime to license, because he didn't know anything. He was the most unpractical person ever examined by the board. What can be done with such men? I believe that it would be a good plan to have some of the deans and members of the council at these meetings, to have more plain talk and not to let one group do all the talking and tell us what to do, because the members of the state boards have to pass on the candidates later.

DR. T. J. CROWE, Dallas, Texas: I don't think any of us can know too much about medicine. I am against any attempt to reduce the premedical or medical qualifications. I believe that any man who wants to call himself a specialist should have at least from three to five years of intensive training in an institution devoted entirely to the subject which he is going to take up. I think the board should do something about that phase of the matter. It can be controlled through the hospitals. Now, about the examinations. There are advisory committees and then advisory committees of advisory committees. Why don't we talk about standardizing examinations? Why don't we talk about standardizing with reference to reciprocal relations and with reference to the credits that should be allowed a man who has been engaged in active practice? I should like to have settled, if possible, what credit shall be given the man who has been in active practice and is required to take a state board examination.

Citizenship and Medical Licensure

DR. J. E. MCINTYRE, Lansing, Mich.: This article appeared in full in *THE JOURNAL*, March 18, page 1075.

Legal Status of the Intern

DR. FRED E. CLOW, Wolfeboro, N. H.: This article will appear in full in *THE JOURNAL*.

DISCUSSION

DR. FRANK M. FULLER, Keokuk, Iowa: There was no mention in this paper of the type of internship that is now known, at least locally, as a voluntary internship. In order that the term may be understood I will say that men from foreign countries are being sent into various institutions by miscellaneous groups who have enough money to assure the government that their protégés are not going to become public charges. Such foreign physicians are being distributed. I say that because the problem has come up in Iowa, where men have come into the state university hospitals as voluntary interns. This means that, after the university has had its full quota of internships assigned, men are sent in with expenses paid to the extent of \$600 a year, as voluntary interns. What is the legal status of interns of this type? When they get through, the board has to have a certificate from the dean or officer of the hospital that they have completed an internship. After having completed a year's internship in Iowa, they are eligible to licensure in the state. The board is concerned as to just how it is going to handle these so-called voluntary internships. To my mind there isn't any such thing. An intern is an intern whether he is voluntary or involuntary. I am asking this in order that some light may be thrown on the problem, which no doubt is going to be more extensive. I have been trying to find out where the idea of voluntary internships originated and who is supporting the unfortunate persons who are being driven out of their own country and brought in here. I should like to know how extensive is the movement toward establishing voluntary internships throughout the country.

DR. EDWARD A. KNOWLTON, Holyoke, Mass.: I did not know until I heard Dr. Clow read his paper that Massachusetts is the only state which licenses interns. I thought that Massachusetts was the last to do anything modern in medical licensure. It has worked out very satisfactorily. There are two types of license, one for the student intern and one for the graduate who is an intern. The licensure provides the board with a registry of all the interns throughout the state. When an intern appears at a hospital, the first thing asked him by the hospital authorities is "Let me see your license."

DR. J. EARL MCINTYRE, Lansing, Mich.: In Michigan the attorney general has ruled that the board has the power of fixing a definite internship period as an educational requirement, and the state has a twelve months rotating internship. The attorney general also has ruled that on completion of this internship, any who practice medicine, either within or without a hospital, thereafter must be registered and licensed by the board. Licensure is therefore required of all second year interns and residents. The attending staff physician is thus not responsible for the intern's or resident's act; the hospital is not responsible because such intern or resident has all the prerogatives of any other doctor of medicine within the state. In other words, the attending physician cannot delegate his authority to practice medicine. He cannot delegate any authority to the intern, resident physician, nurse or technician. This has been a means of solving that particular problem in Michigan.

DR. FRED E. CLOW, Wolfeboro, N. H.: I did not mention in my paper that there are records in New Hampshire of twenty-three malpractice suits brought against interns. Most of these cases, of course, came to nothing, but enough have had to be settled to disturb the board. Apparently the lawyer has found that he cannot recover from the hospital except in rare instances, and he has learned to go back of the hospital to the young man who is the cause of the alleged malpractice. These suits have a nuisance value at least, so that there is often involved the payment of some money in order to clear the young man. When he is an unlicensed person, he is put in an extremely vulnerable position. I cannot answer Dr. Fuller's question. Voluntary internship is not known, at least by that name, in my part of the country, and I do not know of any men who have been placed in hospitals under such circumstances.

The Objectives, Aims and Activities of the Commission on Graduate Medical Education

DR. ROBIN C. BUERKI, Chicago: The Commission on Graduate Medical Education is still less than a year old, and obviously it is not prepared as yet to give specific answers to any of the questions that have been raised. I should like, however, to present some of these questions and suggest possible answers. In a statement of the scope of the work of the commission, the chairman said in part:

"The Commission on Graduate Medical Education will undertake the formulation of the educational problems and principles involved in the continuation of medical training for a period of years after graduation, in the adequate training of specialists and in making recommendations for those in practice, general and limited, to keep abreast of new developments in diagnosis, treatment and prevention. It is the opinion of the commission that these phases of graduate medicine are closely related and should be regarded broadly as parts of a single problem.

"The educational problems of the internship need definition in the larger concept of medical education because of the great confusion that now exists among physicians, hospitals and medical faculties regarding this vital, though frequently unsatisfactory, phase of training. There is need of integrating the hospital training with the undergraduate course and of making it more effective as a preparation either for general practice or for advanced training for a specialty.

"Little attention has yet been given to the opportunities for training for specialization of the large number of practitioners who are otherwise qualified and desire to become fully equipped in a limited field of practice. Sound plans which will meet individual conditions and permit these physicians to secure an adequate preparation in a special field must be worked out.

"In recognition of the need of a study of the whole situation in graduate and postgraduate medical training, it seems desirable that there be set up a group to mobilize the best current opinions and experience and to formulate principles and standards of training which may be of help in setting up programs of instruction. Such a group should comprise representatives of the profession, the specialty boards, the hospitals, the medical schools and the state regulatory bodies familiar with these problems. It would develop standards of training which would be of help to the Association of American Medical Colleges, the Council on Medical Education and Hospitals of the American Medical Association and other agencies concerned with the inspection and evaluation of facilities. There should be no duplication of effort or conflict with such agencies.

"The Advisory Board for Medical Specialties is more representative than any other body of the different interests involved and it was felt that it should create a group to study the whole problem; hence its action in Atlantic City on June 6, 1937, creating the Commission on Graduate Medical Education.

"It was understood that the commission would concern itself primarily with those problems which are common to all the specialty boards and organizations dealing with the different aspects of graduate medicine and would not attempt to accredit or evaluate facilities or perform other administrative functions now carried out by the Association of American Medical Colleges, the American Medical Association, the American College of Surgeons and other administrative agencies. Obviously the material developed would be made available to the interested groups."

The director of study began work March 1, 1938. In a discussion of the whole problem with more than 400 persons from all parts of the country, emphasis has been placed on the fact that this is not a survey. Almost without exception the men visited were in enthusiastic accord with the aims of the commission, feeling that lack of adequate training and opportunities for continued education constitutes one of the greatest problems confronting the medical profession today.

There seems to be a definite feeling that the internship should be more closely related to the undergraduate years and should be considered as such by the staffs of hospitals and the faculties of the medical schools. Partly because almost all medical students after graduation serve as interns in hospitals and partly because medical schools do not feel that at present they have adequate control over the type of internship offered,

it seems to be an open question as to whether or not an internship should be required for graduation. The general feeling is that the average internship is not satisfactory from an educational standpoint, but there is considerable divergence of opinion as to how the educational content of the internship shall be improved.

The vast majority of the internships offered are rotating services; from 1934 to 1938 these increased from 4,569 to 5,697. In spite of the fact that recently there was a decrease in the number of straight internships from 781 in 1934 to 442 in 1938 and an increase in the number of mixed internships from 853 in 1934 to 1,212 in 1938, there is still a rather strong feeling on the part of some authorities that a straight service is desirable. A rather large group of men feel that even in a rotating internship some of the more highly specialized services should not be offered to interns.

There seems to be almost complete unanimity of opinion that a residency of three or more years is the ideal way to prepare a man for the practice of his chosen specialty, nor does there seem to be any major disagreement concerning the ruling of the various specialty boards that a portion of the residency shall contain work in the medical sciences. The majority of the specialty boards feel that such work should train the resident to approach his specialty from the point of view of the scientist and need not necessarily make him more proficient in all the basic science courses; the men in the basic sciences as a whole feel that neither the budgets nor the staffs of their departments are adequate to offer this work and suggest the possibility of training individual clinicians who are members of the various clinical departments and who in turn can give this work to their own residents or, in large groups, to the prospective candidates for certification in their specialty.

There is considerable agitation to have more opportunities available for men already in practice to develop proficiency in their specialty. The general reaction is that short courses, if given for graduates to perfect themselves in a specialty, are not educational in fact and do not train the man to be competent in his chosen field. There is a definite feeling, and figures substantiate it, that the good residencies are too few to produce enough trained men to meet the needs for the replacement in and the growth of the specialties. It is gratifying to note, however, that the number of all residencies has increased by 50 per cent in the last five years, from 2,373 in 1934 to 3,492 in 1938, and that the number of residencies of three or more years in length has trebled in the same period, having increased from 332 in 1934 to 1,092 in 1938. Many of these residencies are not really satisfactory.

The solution of the problem of postgraduate medical education for the general practitioner is a most difficult problem. After the physician has become recognized in his specialty, his contact with national societies and his willingness to read in most instances keeps him abreast of the advances in his specialty, but this is not true in the main of the general practitioner. Some persons have the definite feeling that the only way to keep the rank and file of the profession abreast of the advances in medicine is to give limited licenses, even though they recognize the difficulties involved in such a suggestion. It has also been suggested that a specific amount of postgraduate work be essential for continued membership in the local county medical society.

After eleven months of travel from one end of this country to the other, I feel sure that the medical schools must take more than an academic interest in the building and operation of a coordinated program of medical education that will follow their students from the time of graduation until they retire from the active practice of medicine. In this broad and comprehensive program hospitals will play an increasingly important part, but they must await the constructive leadership that only the medical schools can supply. It is obvious that the solution which I am proposing involves a large expansion of thought and activity on the part of the medical schools. Leadership in meeting this great series of problems must come primarily from those who have heretofore carried the major responsibility for medical education. No other group has the richness of experience in medical education that medical educators have.

(To be continued)

School	PASSED	Year	Per
		Grad	Cent
Stanford University School of Medicine..	(1936)	79	1
Loyola University School of Medicine..	(1937)	82	4
Northwestern University Medical School	(1936)	87	
Rush Medical College	(1935)	87	7
University of Louisville School of		81	7
Washington University School of		82	3
Pennsylvania Medical School, St			
Shanghai	(1935) 78 3, (1938)	79	
Woman's Christian Medical College, Shanghai	(1938)	77	8
School	FAILED	Year	Per
		Grad	Cent
Nippon Ika Daigaku, Tokyo.	(1937)	40	

Five physicians were licensed by endorsement from July 27 through September 24 after an oral examination. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year	Endorsement
		Grad	of
Rush Medical College	(1934)	N. B. M. Ex.	
Tulane University of Louisiana School of Medicine..	(1937)	N. B. M. Ex.	
University of Michigan Medical School..	(1932)	N. B. M. Ex.	
Washington University School of Medicine..	(1933)	N. B. M. Ex.	
Hahnemann Med College and Hospital of Philadelphia (1935)	N. B. M. Ex.		

Kentucky December Examination

Dr. A. T. McCormack, secretary, State Board of Health of Kentucky, reports the written examination held at Louisville, Dec. 6-8, 1938. The examination covered eleven subjects and included 110 questions. An average of 70 per cent was required to pass. Two candidates were examined, both of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Louisville School of Medicine	(1938)	79	
Temple University School of Medicine	(1937)	76	

Fourteen physicians were licensed by reciprocity from September 2 through December 19. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists.	(1936),	(1938)	Michigan
Tulane University of Louisiana School of Medicine.	(1936)		Louisiana
Johns Hopkins University School of Medicine.	(1935)		Maryland
University of Michigan Medical School	(1933)		Michigan
University of Minnesota Medical School.	(1934)		Minnesota
Ohio State University College of Medicine.	(1936)		Ohio
University of Cincinnati College of Medicine.	(1932),	(1935)	Ohio
Western Reserve University School of Medicine.	(1937)		Ohio
Vanderbilt University School of Medicine (1932), (1935), (1936), (1937) Tennessee			

Indiana Reciprocity and Endorsement Report

Seventy-one physicians were licensed by reciprocity and two physicians were licensed by endorsement during 1938 by the Indiana State Board of Medical Registration and Examination. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1935),	(1936)	Arkansas
University of Colorado School of Medicine.	(1936)		Colorado
George Washington University School of Medicine.	(1935)		Maryland
Howard University College of Medicine.	(1936)		Tennessee
Loyola Univ. School of Med (1918), (1932), (1935),	(1937)		Illinois
Northwestern University Medical School.	(1923)		Mississippi
Ohio, (1932), (1933), (1936) Illinois			
Rush Medical College.	(1925)		Kansas
(1935) Ohio, (1936) Utah, (1928), (1930),			
(1932, 2), (1936, 2) Illinois			
School of Med of the Division of	(1936)		Illinois
State University of Iowa College of	(34)		Iowa
University of Kansas School of	(2)		Kansas
University of Louisville School of Medicine (1929), (1930),			
(1936, 3), (1937) Kentucky			
Tulane University of Louisiana School of Medicine.	(1935)		Louisiana
Johns Hopkins University School of Medicine.	(1928)		Louisiana
(1934), (1935) Maryland			
University of Maryland School of Medicine	(1912)		Maryland
Harvard University Medical School.	(1933)		Michigan
University of Michigan Department of Medicine and			
Surgery	(1908)		Michigan
University of Michigan Medical School (1927), (1931),	(1936)		Michigan
St. Louis University School of Medicine.	(1932)		Vermont
(1932), (1936, 2) Missouri			
University of Nebraska College of Medicine.	(1934)		Missouri
Columbia Univ. College of Physicians and Surgeons (1935)			New York
University of Rochester School of Medicine	(1931)		Ohio
Eclectic Medical College, Cincinnati	(1936),	(1937, 2)	Ohio
Ohio State University College of Medicine	(1935)		Ohio
University of Cincinnati College of Medicine.	(1932)		Kentucky
(1935), (1937) Ohio			
Western Reserve University School of Medicine.	(1933)		Ohio
University of Oklahoma School of Medicine.	(1936)		Oklahoma
Temple University School of Medicine.	(1934)		New Jersey
University of Pennsylvania School of Medicine.	(1916)		Kentucky
Medical College of the State of South Carolina.	(1934)		N. Carolina
Meharry Medical College.	(1936, 2)		Tennessee
Wisconsin College of Physicians and Surgeons	(1911)		Wisconsin
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pécs	(1923)		New York
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia	(1934)		New York

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
School of Med of the Division of Biological Sciences	(1937) N. B. M. E.		
University of Michigan Medical School	(1935) N. B. M. E.		

Mississippi December Report

Dr. Felix J. Underwood, secretary and executive officer, Mississippi State Board of Health, reports nine physicians licensed by reciprocity at the meeting held in Jackson, Dec. 8, 1938. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Louisville School of Medicine.	(1910)		Kentucky
Tulane University of Louisiana School of Medicine.	(1938)		Louisiana
University of Maryland School of Medicine and College of Physicians and Surgeons.	(1916)		W. Virginia
University of Pennsylvania School of Medicine.	(1936)		Texas
Meharry Medical College	(1935)		Tennessee
University of Tennessee College of Medicine.	(1936),	(1937)	Tennessee
Vanderbilt University School of Medicine.	(1934)		Tennessee
University of Texas School of Medicine.	(1921)		Texas

Book Notices

Shock and Related Capillary Phenomena. By Virgil H. Moon, A.B., M.Sc., M.D., Professor of Pathology, Jefferson Medical College, Philadelphia. Cloth. Price, \$3.50. Pp. 442, with illustrations. New York: Toronto & London: Oxford University Press, 1938.

The purpose of the book is to present the subject as a pathologic entity. The author states that the major advances in solving the shock problem have been made by physiologists and surgeons, while the contributions made by pathologists have been negligible. In order to remedy this defect, the author attempts to discuss shock as he would any other pathologic condition. The book begins with an excellent review of current knowledge concerning the capillaries; their distribution, function, reactions, permeability and local capillary phenomena associated with the action of histamine, with inflammation and so on. Then follows a brief but good review of the theories concerning shock. The remaining portion of the book, with the exception of an appendix on practical considerations, is devoted to a presentation of the pathologic processes and morphologic changes in shock, to the evidence for the special theory favored by the author, that of traumatic toxemia, and to an attempt to correlate the pathologic processes and morphologic changes in traumatic shock with those found in many other pathologic conditions, including anaphylactic shock, burns, edema and terminal pneumonia, on the basis of primary injury of the capillaries with subsequent loss of circulating fluid. The book is written with the spirit of a crusader. Few readers familiar with the present status of the knowledge of shock will disagree with most of the material presented. The author has summarized in a masterly manner the opinions and conclusions of numerous investigators employing diverse methods of approaching the many different phases of the problem. Such a unanimity of approval will probably not be given the author's considerations of the toxemia theory and his apparent belief that the shock problem has been definitely solved. The book is recommended for those desiring a well written and stimulating review of the known facts concerning capillary phenomena. Pertinent references and a suitable index are given. The print is large and easy to read.

A Study of Asbestosis in the Asbestos Textile Industry. By Waldemar O. Dreesen, Passed Assistant Surgeon, and others. From the Division of Industrial Hygiene, National Institute of Health. Prepared by direction of the Surgeon General U. S. Treasury Department, Public Health Service. Public Health Bulletin No. 241. Paper. Price, 20 cents. Pp. 126, with 64 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1938.

This complete study of the asbestos industry made by the Division of Industrial Hygiene of the United States Public Health Service ranks with the best of the industrial studies that this group has produced. Initiated by the State Board of Health and by the Industrial Commission of North Carolina, the objectives of the study were to determine the effects of continued inhalation of asbestos dust, identifying the various processes which produce the dust, and recommending at the same time the indicated engineering improvements to control the pollution of the atmosphere. The study endeavors to determine what concentrations of asbestos dust can be safely borne. The report begins with a description of the various processes in which asbestos is used in combination with cotton to fabricate various textiles. A brief comparison is made with the similar industry in Great Britain. An analysis of the various occupations involved was made and dust samples were collected by the standard impinger method with reference to each occupation. It was demonstrated that it was possible to reduce the dust concentration below five million particles per cubic foot. In all, about 550 asbestos workers received thorough physical examinations, including a carefully worked out occupational history. Both the x-rays and the fluoroscope were used and the observations were carefully tabulated. The investigators classified the asbestosis cases on the basis of x-ray interpretations in three stages, although pointing out that it is not practicable to establish a sharp line of demarcation between the stages. Of a total of 445 workers examined with x-rays, seventy-three were diagnosed as having asbestosis. It should be remembered that all examined in the groups were individuals who were working daily. Including

both workers still on the job and those who had been discharged or laid off, 27.5 per cent were found to have asbestosis. This figure might be compared with the results of the silicosis studies at Picher, Okla., where 21.3 per cent had silicosis, and the study of anthracite miners by this same group, among whom the prevalence of anthracosilicosis was 23 per cent. The report includes a chapter on pathology. The numerous illustrations, both reproductions of slides as well as lung specimens and x-ray films, are excellent. This is an admirable report, is a substantial contribution to the general subject of pneumoconiosis, and will go a long way toward clarifying some of the doubtful aspects of asbestosis.

The Practical Applicability of the Cardio-Pulmonary Function Test. By Gustav Nylin. *Acta medlea scandinavica*, Supplementum 93. Paper. Pp. 24, with 25 illustrations. Stockholm, 1938.

In attempting to evaluate the functional capacity of the heart, various investigators have tried many types of tests. Perhaps the most valuable functional test is that which measures the energy cost of physical exercise. Among such tests is the one developed by Nylin. The results of his experience are presented in this monograph. The test used by him consists of three degrees of exertion on a pair of semicircular stairs each having six steps going up and six going down. The effect of these exercises on the oxygen consumption was determined by comparing the basal rate with the increased rate occurring from two to five minutes after completing the exercise. Both metabolic tests were run with the patient reclining in bed. As the result of an experience on 265 normal persons and twenty-two patients with various forms of cardiac and pulmonary disease, the author states that this test gives an estimate of the functional capacity of the heart when the state of the pulmonary system is taken into account. It is unfortunate that he uses the term "relative oxygen debt," because a sample of the excess oxygen consumption of exercise need not necessarily be a measure of the entire extra oxygen consumption caused by the exercise. Nevertheless, viewing it entirely from its practical utility the method developed seems promising and deserves further trial. The presentation is simple and somewhat superficial. It should nevertheless be appealing to those interested in objective methods of estimating cardiac capacity and cardiac reserve. While it is meritorious to seek objective methods of estimating cardiac capacity, no method will turn out to be as practically efficacious as a careful inquiry by the physician into the ability of the patient to do his daily activities and to meet the extra strains which he is forced to cope with. There is no short cut to a careful history. It is true, however, that the discipline placed on the clinician by information derived from proper objective tests may at times be invaluable.

Biokhemični zmlni krovi i spinnomozgovoi ridini pri uremii. [By] M. L. Ertukhova. [Biochemical Changes in Blood and Cerebrospinal Fluid in Uremia.] Paper. Price, 6 kopecks. Pp. 166. Kiev: Vydavnistvo Akademii Nauk USSR, 1938.

The author studied biochemical variations in the blood and the cerebrospinal fluid of thirty-nine uremic patients. The studies included the alkali reserve, most of the nitrogenous fractions of the protein metabolism ordinarily determined in the blood, the inorganic phosphorus, K, Ca, the chlorides, Na, cryoscopy, sugar, cholesterol and lactic acid. The simultaneous study of the blood and the cerebrospinal fluid is valuable from both the diagnostic and the therapeutic points of view. Thus, data obtained from the group of patients suffering from "azotemic" uremia, cases characterized by the disturbance of the nitrogen excretory function without a disturbance of the acid excretory function and without any manifestation of disturbance of the permeability of the hemato-encephalic barrier, permitted the author to draw the conclusion that the process can be reversed by elimination of the causes giving rise to accumulation of nitrogenous waste products, as, for example, infection or dietetic disorder. In another group in which, along with the azotemia, there were observed a sharp fall in the alkali reserve and manifestations of the disturbance of the permeability of the cell membrane, specifically the hemato-encephalic barrier, the prognosis was unfavorable and treatment powerless. The group with acute convulsive uremia justifies the assumption of cerebral edema and the use of spinal

puncture. The author's thesis is that comparative study of the biochemical changes and the clinical manifestations rather than the search for the hypothetic uremic toxin will lead toward the solution of the essential pathogenesis of uremia.

This suggestive contribution to the clinical subject of uremia is written in the Ukrainian. It contains summaries in Russian and English.

Babies are Human Beings: An Interpretation of Growth. By C. Anderson Aldrich, M.D., Associate Professor of Pediatrics, Northwestern University Medical School, and Mary M. Aldrich. Cloth. Price, \$1.75. Pp. 128, with 5 illustrations. New York: Macmillan Company, 1938.

This book, written by a pediatrician and his wife, presents the problem of growing up from the point of view of the child. This is indicated by various chapter headings, such as "The Baby Dilemma," "The Baby Responds to the World" and "The Baby's Way of Eating." Emphasis is laid especially on the response of the infant and on ways and means of making his environment as helpful as possible in developing his own personality and in fitting himself into this world without sacrificing his enthusiasm and energy, which is so evident at 2 and 3 years of age and which so often is lost later on. The volume should be helpful in solving many of the problems which the physician meets, not so much by the specific advice given in a particular situation as by serving as a basis for working out problems. For parents it should prove of great value. It is a book not only to be read but to be reread and studied, chapter by chapter, by both mother and father. It will give the parents an insight into what their offspring is trying to accomplish in growing up and how they as parents can help in making it possible for him to reach maturity with the least number of harmful bumps and with his native enthusiasm intact.

The Principles and Practice of Perimetry. By Luther C. Peter, A.M., M.D., Sc.D., Professor of Ophthalmology in the Graduate School of Medicine of the University of Pennsylvania, Philadelphia. Fourth edition. Cloth. Price, \$4.50. Pp. 331, with 227 illustrations including 5 colored plates. Philadelphia: Lea & Febiger, 1938.

This book has long been of established value to the ophthalmologist and practitioner in allied branches of medicine. The new edition is revised and enlarged with new illustrations and tables to clarify the text and points of difference. As in former editions, the various phases of perimetry are presented in logical sequence. Part I consists of a brief but adequate description of the anatomy and physiology of the visual pathway. Part II describes the extent of the normal visual fields and physiologic principles which govern and influence them. Part III outlines in a clear and detailed manner the method and technic of taking fields. The various instruments are described. Part IV discusses the general pathology of the visual field. The special pathology of fields is dealt with in Part V. In part VI the fields in functional nervous disease is discussed. A good bibliography is added for those who are interested in various problems which perimetry presents.

Urology. By Daniel N. Elsendorath, M.D., Consulting Urologist to the American Hospital, Paris, France, and Harry C. Roinick, M.D., Attending Urologist, Michael Reese, Mt. Sinai, and Cook County Hospitals, Chicago. Fourth edition. Cloth. Price, \$10. Pp. 1,061, with 762 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1938.

This is an excellent textbook for students and a valuable manual for the general practitioner. The personal experience of the authors is apparent and their therapeutic and operative recommendations represent the standard methods of today. Many of the illustrations have been selected from American and European sources. The original illustrations for this edition have also been well chosen. The chapter on neurogenic dysfunction of the bladder will be well received. Urology in the female is adequately presented in a single chapter. Consideration of the etiologic factors of dilatation of the ureters and renal pelvis in pregnancy is taken up under three possible headings: (a) mechanical, (b) muscular atony resulting "from the action of either hormones or of toxins on ureteral and renal pelvic musculature with resultant atony," and (c) mixed origin, viz. the resultant of the chief factor of atony and of compression by the uterus as a secondary cause. While this subject is still a question and various points of view have been expressed in both clinical and experimental contributions

to the subject, recent experimental work would seem to have demonstrated that the dilatation of the upper part of the urinary tract during pregnancy is primarily due to hormonal influence. An occasional typographic error appears, as in the last sentence on page 517. As a whole this book can be heartily recommended and it ranks high in the category of available textbooks for teaching in medical schools. Its broad scope and excellent index will make it a valuable reference work for the specialist in urology. Many references to the earlier editions appear in recent periodical literature of urology in the English language.

Minor Maladies and Their Treatment. By Leonard Williams, M.D. Seventh edition. Cloth. Price, \$3.75. Pp. 439. Baltimore: William Wood & Company, 1937.

This edition of a work first published in 1906 has been revised and keeps pace with the discoveries and change in practices in the treatment of minor maladies, including coughs, colds, sore throats, indigestion, constipation, diarrhea, neuralgia, headaches and minor glandular disturbances, and concludes with chapters on general health and treatment in advanced years. While the therapeutic methods suggested at times do not conform with the generally accepted beliefs, the methods employed are satisfactory and will usually be found beneficial. Each subject is considered with sufficient thoroughness to aid in assuring adequate therapy. The book will continue to find its field of usefulness.

The Etiology of Trachoma. By Louis A. Jullienne, Chairman of the Trachoma Commission, Washington University, St. Louis. Cloth. Price, \$3.25. Pp. 248, with 13 illustrations, including 10 plates. New York: Commonwealth Fund; London: Oxford University Press, 1938.

Among other things, this book contains a summary of the studies in trachoma that have been in progress in the Oscar Johnson Institute of Washington University for the past eight years. Almost all of the material has appeared at various times in the journals of ophthalmology and as such is familiar to students of the subject. In the eleven chapters of the book the epidemiology, causation and infectivity of trachoma are discussed at some length, after which the text swings into technical descriptions of the bacterial flora of the disease, inclusion bodies and the virus aspect. The conclusion is that "the infectious agent of trachoma is a virus of remarkable frailty, succumbing before physical and chemical agents tolerated by numerous other bacterial and viral agents." A thorough bibliography and index are appended. The book work is good and the illustrations are excellent. The monograph represents a large amount of work, especially of a bibliographic nature, and as such is of great value from a reference standpoint.

Jan Ev. Purkyně 1787-1937; Sborník statí k 150. výročí narození českého učenice. [Jan Ev. Purkyně 1787-1937: Collection of Articles in Honor of 150th Anniversary of Birth of Czech Scientist.] Paper. Pp. 325, with illustrations. Prague: Purkyně Society for Study of Life and Works of J. E. Purkyně, 1937.

This book consists of twenty-seven essays on the life and work of Johannes Evangelista Purkinje. Among the contributors are the foremost Czech scientists. The volume is divided into two parts: In the first are discussed Purkinje's contributions to science; in the second, some phases of his private life, his character, his philosophy, his love of literature and his efforts to awaken the national spirit of the Slavs in general and of the Czechs in particular. The last seventeen pages contain a list of Purkinje's publications and a program of the international celebration in Prague in September 1937 to commemorate the one hundred and fiftieth anniversary of his birth. It is claimed that Purkinje is the founder of microscopic anatomy and experimental physiology in Germany. His noteworthy contributions to the biologic and medical sciences make him one of the founders of modern medicine. Among his contributions to biology was his description of the cell, which he considered the fundamental unit of the living organism. He was the first to use the term "protoplasm" to designate the living substance of a cell, and the second after Dujardin to call attention to the existence of this substance. He is credited as being the first anatomist to describe the nerve cells in the brain, spinal cord and ganglions as well as the first to demonstrate glandular tissue in the stomach. He made many original studies

on the eye, heart, sex organs, skin, blood vessels, connective tissue, cartilage and bone. With the acquisition of the Ploesl microscope later in his life he was able to amplify these studies. The account of his pharmacologic experiments makes interesting reading. Many of these studies he carried out on his own person. He investigated the action of camphor, digitalis, belladonna, opium, ipecac, turpentine and other substances. He systematized dactyloscopy, classifying finger prints into nine groups. A modification of this classification is being used now in criminology. About the importance of physiology in medicine he wrote:

A modern physician cannot be trained for research or physiology by attending the clinics or by the study of the old masters. His training, beginning with the observation on the sick, must continue in the laboratory, where science is taught and where progress in contemporary medicine is made. It is clear then that physiology, in whose domain rests this experimental laboratory investigation, is the climax of the education of a modern physician, the crown of his medical understanding and the embryo of further progress. For a physician must not be deceived about understanding disease when he can designate it by name or place it into a certain system; he must take to mind that only then does he understand disease when he masters it scientifically, prognostically as well as therapeutically. The attainment of this progress is possible only through physiologic investigation. It is evident, therefore, that physiology is the fundamental medical science.

Purkinje's extreme modesty prevented him from publishing many interesting and valuable observations. The Purkinje Society of Czechoslovakia is engaged in bringing to light such material as has not been presented thus far, as well as in solving some of the controversies regarding priorities. This stimulating book is highly recommended to research workers and physicians. It is unfortunately not available in English translation.

Physiologie des Nebennierenmarkes. Von Gustav Bayer und Doz. Dr. Dr. Theodor Frhr. v. d. Wense. Band VI, Zwanglose Abhandlungen aus dem Gebiete der Inneren Sekretion. Herausgegeben von Professor Dr. W. Berblinger. Paper. Price, 11.70 marks. Pp. 87. Leipzig: Johann Ambrosius Barth, 1938.

More than one fourth of this comprehensive but not analytic and critical review of the literature on the adrenal medulla, epinephrine and "sympathin" during the last twenty-five years is taken up by the bibliography. The brief citations of the numerous inconclusive, if not contradictory, results of research, without much attempt at appraisal, especially in the section dealing with the possible relation of the adrenal medulla to the other endocrines, leaves most doctors not much wiser.

Modern Anæsthetic Practice. Edited by Sir Humphry Rolleston, Bt. G.C.V.O., M.D., and Alan A. Moncreiff, M.D., F.R.C.P. Published on behalf of The Practitioner. Cloth. Price, 10s. 6d. Pp. 231, with 6 illustrations. London: Eyre & Spottiswoode (Publishers) Ltd., 1933.

This volume is prepared especially for the general practitioner of medicine in England. The introduction by Blomfield and the first chapter, by Hewer, on theoretical aspects of anesthesia and analgesia, are the best portions of the book and are appropriate for any textbook on anesthesia. Chapter 2, by Featherstone, on the use of volatile anesthetic agents, is conservative and to the point although nothing new is presented. Chapter 3, by Macintosh and Pratt, on nitrous oxide anesthesia in surgery, does not seem to belong in a book bearing the title of Modern Anæsthetic Practice, except for the discussion of the use of nitrous oxide in minor surgery and the value of preliminary medication in connection with its use. Chapter 4, by Ashworth, on basal anesthesia, presents briefly the common practice in England with basal anesthetic agents. Chapter 5, on endotracheal anesthesia, summarizes briefly and well the endotracheal method of anesthesia. In chapter 6, on spinal anesthesia, the present trend in spinal anesthesia is presented conservatively without going into much detail. Chapter 7, on anesthesia and analgesia in midwifery, is excellent and represents a conservative view on the relief of pain in childbirth. Chapter 8, by Evans, on anesthesia and the child, is commendable and deserves to be read by anesthetists in general. In chapter 9, by Vaile, on anesthesia in dentistry, is presented the English attitude in anesthetizing the dental patient but nothing new is presented. Chapter 10, by Romanis, on local anesthesia and analgesia, is conservative but excellent as far as it goes; few types of block anesthesia are discussed, however; the main thing stressed is the value of infiltration with procaine and epinephrine, which is not debatable. Chap-

ter 11, by Magill, on the anesthetic aspects of postoperative care, is one of the most valuable chapters in the book and could be read to advantage by all anesthetists and surgeons. Chapter 12, on risks of explosion in anesthesia, is an excellent summary of present day opinion on the subject. This is a book that most anesthetists of this country will want to read at least, if not own. Its value for general practitioners in the United States is not apparent.

Dunant: The Story of the Red Cross. By Martin Gumpert. Cloth. Price, \$2.50. Pp. 323, with portrait. New York: Oxford University Press, 1938.

This book is the pathetic, not to say tragic, story of the Nobel peace prize winner Henri Dunant, who was the first to entertain the conception of an international society for the alleviation of the sufferings of wounded in battle and of prisoners. Dunant was an ordinary citizen of Geneva, somewhat better off than the average, if not actually wealthy, who was engaged in the banking business. He came into contact with war somewhat accidentally at the battle of Solferino, where the French and the Austrians met in 1859. Here he was plunged into the midst of the fighting and saw the miserable lack of accommodations for the wounded and the total absence of doctors, nurses and medical supplies. He plunged into the emergency and made heroic efforts to supply as much as possible of the need through his own labor. Needless to say his success was scarcely worth mentioning, but the impression of horror was etched so deep on his mind that it dominated the rest of his life. After Solferino he could never get rid of the idea and he traveled all over Europe meeting statesmen, kings, emperors, politicians, society leaders and literati. He became a salesman for an obsession. Quiet and retiring in nature, he was relentless in a gentle sort of way and had an exceedingly persuasive way with persons whom he could meet individually. He was in no sense a rabble rouser; neither was he an organizer. In fact, though the Red Cross idea was his, the development of the idea was made possible largely through the organizing ability of one of his associates, Moynier. Toward the end of his life Dunant was disappointed by the hypocrisy and lip service of many who professed adherence to his idea and this, coupled with bankruptcy from squandering his resources on the promotion of his ideas, caused him to retire into oblivion, from which he did not emerge until he was accidentally discovered living in obscurity in Switzerland. He then received the Nobel peace prize, which he dedicated in its entirety to furtherance of Red Cross work, for by this time the International Red Cross had been established and was to a large extent functioning. The book is written with what is obviously an intense affection for Dunant. His tragic life story is depicted with sympathetic understanding and an appreciation of the mental and spiritual struggle which motivated the founder of the Red Cross. The author also develops and strongly emphasizes the idea that the Red Cross in its present form and functioning is a negation and a betrayal of the ideals and purposes of the founder, who is represented as coming in his later years to a feeling that his first proposal for aid on the battlefield was a totally inadequate approach and that the real function and purpose of the Red Cross should be to agitate for universal peace. Whether one takes the view of the author or not, the fact remains that the Red Cross as we know it is a living monument to the tragic life of Henri Dunant.

Classic Descriptions of Disease With Biographical Sketches of the Authors. By Ralph H. Major, M.D., Professor of Medicine, University of Kansas School of Medicine, Kansas City. Second edition. Cloth. Price, \$5.50. Pp. 727, with 137 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1939.

Distinctive in this edition are sections covering malaria and yellow fever as well as many new illustrations. The author points out that many of the biographic sketches have been rewritten, and the index has been revised and enlarged. For the student and the teacher of medical history as well as for the dilettante in this field Major's contribution is invaluable. Even for those who have been little concerned in the past with medical history the book will be attractive and will serve in many instances to initiate them to a lifelong interest in this field.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Foot Drop Following Operation on the Knee; Res Ipsa Loquitur.—The plaintiff sued the defendant physicians to recover damages for injuries allegedly due to their negligence in performing an operation on his left knee. The trial court directed a verdict for defendant Carlson and entered an order of non-suit in favor of the defendant Ream. The plaintiff then appealed to the district court of appeal, first district, division 2, California.

The plaintiff suffered a strain of the crucial ligaments and external lateral ligaments of his left knee and was treated by defendant Carlson. As a result of the treatment, the plaintiff was able to walk and had full use of his left leg and foot but some instability remained in his left knee which made it impossible for him to perform the work he had formerly been employed to do. To correct this condition, defendant Carlson, assisted by defendant Ream, operated on the knee. Immediately thereafter the plaintiff suffered from foot drop and his leg was placed in a cast, but the treatment resulted in no improvement. About five months later a third physician performed an operation on the knee and found that the external peroneal nerve had been severed at a point approximately where its course intersected the course of the incision made by defendant Carlson. The ends of the nerve were freshened and sutured together, but there was practically no improvement in the plaintiff's condition.

It was conceded that the nerve was severed during the course of the operation performed by the defendants. On appeal, the plaintiff contended that the defendants failed to examine the nerve before closing the wound to ascertain whether it had been injured and that this omission constituted negligence. This contention, the court said, was without merit. The medical testimony disclosed that the nerve was not laid bare but was retracted with the tissue surrounding it. To examine it, the surrounding tissue would have had to be laid open along the length of the nerve, an act which might itself have resulted in severe injury to the nerve. The evidence further disclosed that the standard practice of surgeons of good repute in the locality was to ascertain after the completion of the operation and after the patient had regained consciousness whether the nerve had been injured by means of testing certain reflexes in the lower leg and foot. This was done in the present case, the court pointed out.

The plaintiff next contended that the doctrine of *res ipsa loquitur* applied and therefore an inference of negligence might arise sufficient to support a verdict in his favor. The determining factor, the court said, as to whether the doctrine applies in operative cases of the kind under consideration is whether the act causing the injury is one which can be visualized by the layman or whether it is one which depends entirely on scientific or medical knowledge. The plaintiff was completely anesthetized when the operation was performed on his knee and it was impossible for him to know what occurred. The defendants were in complete charge of the operation during the course of which the external peroneal nerve was severed. The nerve was not being treated and it was not in any way diseased. While the nerve lay in the operative field, it was involved only to the extent that it had to be retracted to one side in order that the operator might go beneath it. Scientific or expert opinion was not required, in the opinion of the court, because no question was raised with respect to negligence either in the diagnosis or treatment of a human ailment. The testimony of experts was necessary to establish the facts concerning the location and function of the external peroneal nerve, the location of the crucial and external lateral ligaments of the left knee, the location of the operative fields, and the extent to which the external peroneal nerve was involved in the operation which the defendants undertook to perform. But, once these facts were established, the inference of negligence was one which may be drawn by the application of the common knowledge of laymen.

The doctrine of *res ipsa loquitur*, where applicable, gives rise to an inference of negligence. If that inference is met by the

introduction of evidence which rebuts it, then the inference is overcome and a non-suit or directed verdict is proper. The evidence introduced by the defendant Carlson, the court pointed out, made no attempt to explain how the nerve was severed. Three expert witnesses for the defendants testified that the methods followed by the defendants in the course of the operation constituted good standard practice, as followed by surgeons of good repute in the same locality. But no one testified that the actual operation as performed was done with due care in all its details. These witnesses testified also that even though the operation on the knee were performed with due care, the external peroneal nerve would be severed in from 5 to 9 per cent of the cases and that the presence of scar tissue caused by the injury to the ligaments would increase the likelihood that the nerve would be severed. None of this evidence, the court said, rebutted the inference of negligence with respect to defendant Carlson in a clear and positive manner and the trial court should not have directed a verdict in his favor.

As to defendant Ream, the record presented a different case, in the opinion of the court. The plaintiff contended and the defendants conceded that the nerve was severed during the course of the operation. The evidence was clear, positive and uncontradicted that defendant Ream had not cut around the peroneal nerve. He handled the retractors after they were placed by defendant Carlson, who testified that defendant Ream handled no instruments that would actually have severed the nerve. In the light of this evidence, the inference of negligence which might arise from the application of the doctrine of *res ipsa loquitur* was completely rebutted and dispelled as to defendant Ream by clear, positive and uncontradicted evidence. It followed, the court said, that, as the inference of negligence as to this defendant was dispelled from the case as a matter of law, the order granting a non-suit was proper.

The appellate court, therefore, affirmed the order granting a non-suit in favor of defendant Ream but reversed the judgment entered on the directed verdict in favor of defendant Carlson — *Engelking v Carlson (Calif.)*, 80 P. (2d) 96.

Society Proceedings

COMING MEETINGS

- American Medical Association, St. Louis, May 15-19 Dr. Olin West, 535 North Dearborn St., Chicago, Secretary
- Alabama, Medical Association of the State of, Montgomery, April 18-20. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
- American Academy of Tuberculosis Physicians, St. Louis, May 13-14. Dr. Arnold Minnig, 638 Metropolitan Bldg., Denver, Secretary.
- American Association for the Study of Gout, Cincinnati, May 22-24. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
- American Association for Traumatic Surgery, Hot Springs, Va., May 8-9. Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.
- American Association of Genito Urinary Surgeons, Williamsburg, Va., May 24-26 Dr. Charles C. Higgins, 2050 East 93d St., Cleveland, Secretary.
- American Association of Industrial Physicians and Surgeons, Cleveland, June 5-8 Dr. V. S. Cheney, Armour and Company, Union Stock Yards, Chicago, Secretary.
- American Association of the History of Medicine, Atlantic City, N. J., April 30-May 1. Dr. Henry E. Sigerist, 1900 Monument St., Baltimore, Secretary.
- American Association on Mental Deficiency, Chicago, May 3-6. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
- American Bronchoscopic Society, Rye, N. Y., May 26 Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.
- American Dermatological Association, Montebello, Canada, May 31-June 3. Dr. Fred D. Weidman, University of Pennsylvania Medical Laboratories, Philadelphia, Secretary.
- American Gastro Enterological Association, Atlantic City, N. J., May 1-2. Dr. Russell S. Boles, 1901 Walnut St., Philadelphia, Secretary.
- American Gynecological Society, White Sulphur Springs, W. Va., May 22-24 Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.
- American Heart Association, St. Louis, May 12-13. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.
- American Laryngological Association, Rye, N. Y., May 24-26. Dr. James A. Babbit, 1912 Spruce St., Philadelphia, Secretary.
- American Laryngological, Rhinological and Otolological Society, Chicago, May 10-11. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.
- American Medical Legal Association, Chicago, May 12-13. Dr. Michel Pijoan, 124 Commonwealth Ave., Boston, Secretary.
- American Neurological Association, Atlantic City, N. J., June 5-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.
- American Society of Ophthalmologists, New Haven, Conn., June 5-7. Dr. Eugene C. Minn, Secretary.
- American Society of Otolaryngologists, New York, May 22-23 Dr. Thomas J. Harris, 104 East 40th St., New York, Secretary.
- American Pediatric Society, Sky Top, Pa., Apr. 27-29 Dr. Hugh McCulloch, 325 North Luchd Ave., St. Louis, Secretary.
- American Physiological Society, Toronto, Canada, Apr. 26-29. Dr. A. C. Ivy, 303 East Chicago Ave., Chicago, Secretary.
- American Psychiatric Association, Chicago, May 8-12 Dr. Arthur H. Ruggles, Butler Hospital, Providence, R. I., Secretary.
- American Radium Society, St. Louis, May 15-16. Dr. Frederick W. O'Brien, 465 Beacon St., Boston, Secretary.
- American Society for Clinical Investigation, Atlantic City, N. J., May 1 Dr. Isaac Starr, University of Pennsylvania Hospital, Philadelphia, Secretary.
- American Society for Experimental Pathology, Toronto, Canada, April 26-29. Dr. Paul R. Cannon, Dept. of Pathology, University of Chicago, Chicago, Secretary.
- American Society for Pharmacology and Experimental Therapeutics, Toronto, Canada, Apr. 26-29. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.
- American Society for the Study of Allergy, St. Louis, May 15-16 Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.
- American Society of Anesthetists, New York, Apr. 14 Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.
- American Society of Biological Chemists, Toronto, Canada, Apr. 26-29 Dr. C. G. King, Univ. of Pittsburgh, Dept. of Chemistry, Pittsburgh, Secretary.
- American Society of Clinical Pathologists, St. Louis, May 12-14 Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.
- American Surgical Association, Hot Springs, Va., May 11-13 Dr. Charles G. Mixer, 319 Longwood Ave., Boston, Secretary.
- American Therapeutic Society, St. Louis, May 12-13 Dr. Joseph F. Elward, 1726 E. St. N.W., Washington, D. C., Secretary.
- American Urological Association, White Sulphur Springs, W. Va., May 29-June 1. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.
- Arizona State Medical Association, Phoenix, Apr. 13-15. Dr. D. F. Harbridge, 15 East Monroe St., Phoenix, Secretary.
- Arkansas Medical Society, Hot Springs National Park, May 8-10 Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.
- Associated Anesthetists of the United States and Canada, St. Louis, May 15. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary General.
- Association for the Study of Internal Secretions, St. Louis, May 13-14 Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.
- Association of American Physicians, Atlantic City, N. J., May 23 Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.
- Association of Military Surgeons of the United States, Washington, D. C., May 8-10. Dr. H. L. Gulchris, Army Medical Museum, Washington D. C., Secretary.
- California Medical Association, Del Monte, May 1-4 Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.
- Connecticut State Medical Society, New Haven, May 25-26 Dr. Creighton Barker, 258 Church St., New Haven, Secretary.
- District of Columbia, Medical Society of the, Washington, April 25-27 Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Executive Secretary.
- Federation of American Societies for Experimental Biology, Toronto, Canada, Apr. 26-29. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.
- Florida Medical Association, Daytona Beach, May 1-3. Dr. Shaler Richardson, 111 W. Adams St., Jacksonville, Secretary.
- Georgia, Medical Association of, Atlanta, Apr. 25-28 Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
- Illinois State Medical Society, Rockford, May 2-4. Dr. H. M. Camp, 224 S. Main St., Monmouth, Secretary.
- Iowa State Medical Society, Des Moines, Apr. 25-27. Dr. Robert L. Parker, 3510 Sixth Ave., Des Moines, Secretary.
- Kansas Medical Society, Topeka, May 1-4 Mr. C. G. Munns, 112 W. 6th St., Topeka, Executive Secretary.
- Louisiana State Medical Society, Alexandria, Apr. 24-26 Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
- Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 25-26 Dr. Walter Dent Wise, 1211 Cathedral St., Baltimore, Secretary.
- Massachusetts Medical Society, Worcester, June 6-8. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.
- Minnesota State Medical Association, Minneapolis, May 31-June 2 Dr. B. B. Souster, 11 West Summit Ave., St. Paul, Secretary.
- Mississippi State Medical Association, Gulfport, May 9-11. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.
- Missouri State Medical Association, Excelsior Springs, Apr. 10-12 Dr. E. J. Goodwin, 634 North Grand Blvd., St. Louis, Secretary.
- National Association of Physicians, New York, June 12 Dr. G. Randolph, Secretary.
- Nebraska Medical Association, Omaha, May 24. Dr. R. B. Adams, Secretary.
- New Hampshire Medical Association, Portsmouth, June 8-9 Dr. Carlton R. Metcalf, Secretary.
- New Jersey Medical Association, Newark, Secretary.
- New Mexico Medical Society, Gallup, May 11-13. Dr. L. B. Cohenour, 319 W. Central Ave., Albuquerque, Secretary.
- New York, Medical Society of the State of, Syracuse, April 24-27 Dr. Peter Irving, 2 East 103d St., New York, Secretary.
- New York State Association of Public Health Laboratories, Valhalla, May 8 Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.
- North Carolina, Medical Society of the State of, Cruise to Bermuda, May 9-14. Dr. T. W. M. Long, Roanoke Rapids, Secretary.
- North Dakota State Medical Association, Bismarck, May 8-10. Dr. Albert W. Skelsey, 204 N. 3rd St., Bismarck, Secretary.
- Ohio State Medical Association, Columbus, May 13. Dr. L. S. Willour, Third and Main, Secretary.
- Rhode Island Medical Society, Providence, June 7-8. Dr. Guy W. Well, 124 Waterman St., Providence, Secretary.
- Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., Apr. 29. Dr. W. C. Spain, 116 E. 53d St., New York, Secretary.
- South Carolina Medical Association, Spartanburg, April 11-13. Dr. E. A. Hines, Seneca, Secretary.
- South Dakota State Medical Association, Aberdeen, Apr. 24-26 Dr. Clarence E. Sherwood, Madison, Secretary.
- Tennessee State Medical Association, Jackson, Apr. 11-13 Dr. H. H. Shoulders, 706 Church St., Nashville, Secretary.
- Texas, State Medical Association of, San Antonio, May 8-11 Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

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- Facial Hemiatrophy: Report of Two Cases. F. B. Walsh, Baltimore.—p. 1.
Staphylococcus Toxin: Experimental Study in Rabbits. J. H. Allen and A. E. Braley, Iowa City.—p. 11.
Influence of the Central Nervous System on the Pigment Migration in the Retina of the Frog. H. M. Burian, Hanover, N. H.—p. 16.
A Contact Lens-Telescopic System. J. W. Bettman and G. S. McNair, San Francisco.—p. 27.
*Vitamin Therapy in Ophthalmic Practice. J. Laval, New York.—p. 33.
Lectures on Motor Anomalies: V. Development and Course of Strabismus. A. Bielschowsky, Hanover, N. H.—p. 38.
Parallel Study of the Pathogenesis of Rhinogenous Optic Neuritis and of Serous Iritis. B. Waldmann, Oradea, Rumania.—p. 44.
Intra-Ocular Tension in Electropexia: Preliminary Report. H. C. Ernsting, Cleveland.—p. 54.
Causes of Blindness in Indiana. D. H. Row and C. D. Chadwick, Indianapolis.—p. 57.

Vitamin Therapy in Ophthalmic Practice.—Laval suggests that in certain ophthalmologic conditions in which deficiencies of vitamins exist it might be theoretically valuable to prescribe the following treatment: 1. A tablespoonful of cod liver oil twice daily should be prescribed in cases of poor dark adaptation, phlyctenular keratoconjunctivitis, photophobia and low grade conjunctivitis in women who are on a slenderizing diet or in cases of other corneal and conjunctival lesions in which the history shows a deficiency of vitamin A. 2. In cases of incipient cataract, optic neuritis, retrobulbar neuritis and also toxic amblyopia vitamin B (B_1 and B_2) may be prescribed. This could be taken daily in the form of eight tablets of brewers' yeast or in the powdered form. 3. The juice of at least two large oranges or one grapefruit daily can be ordered in cases of incipient cataract. (This is plus the brewers' yeast, which is also to be taken daily.) In cases of intra-ocular hemorrhage the juice of four lemons daily is suggested.

American Journal of Orthopsychiatry, Menasha, Wis.

9: 1-272 (Jan.) 1939. Partial Index

- Enuresis: Study in Etiology. Margaret W. Gerard, Chicago.—p. 48.
*Incidence of Enuresis and Age of Cessation in 1,000 Neuropsychiatric Patients: Discussion of Relationship Between Enuresis and Delinquency. J. J. Michaels, Boston, and Sylvia E. Goodman, Ann Arbor, Mich.—p. 59.
Proposed Classification of Psychiatric Problems. G. S. Sprague, White Plains, N. Y.—p. 72.
Psychiatric Nomenclature. E. Harms, Washington, D. C.—p. 81.
Overestimation of Psychopathology. G. Zilboorg, New York.—p. 86.
Some Parallels Between Dynamic Psychiatry and Cultural Anthropology. Helen Leland Witmer.—p. 95.
The Economic Factor in Disorders of Behavior. T. Burrow, New York.—p. 102.
Psychiatry in a Boys' Club. A. R. Martin, New York.—p. 123.
Psychoses and the Prepsychotic Personality. T. V. Moore, Washington, D. C.—p. 136.
Inter-Agency Use of Child Guidance Clinics: From the Point of View of the Cooperative Effort of Social Workers. Rose Green, Philadelphia.—p. 170.
Tutoring as Therapy. Grace Arthur, St. Paul.—p. 179.
The Drama as a Therapeutic Measure in Adolescents. F. J. Curran, New York.—p. 215.

Enuresis in Neuropsychiatric Patients.—According to Michaels and Goodman, there was an incidence of 19.3 per cent of enuresis in 1,000 neuropsychiatric patients distributed in fourteen diagnostic groups. The incidence was significantly higher in the groups of psychopathic personality (32.2 per cent), psychiatric behavior problems (43.8 per cent) and mental deficiency (33.3 per cent). There were consistently more males among the enuretic, this being especially prominent among the

psychopathic personalities and the psychiatric behavior problems. Patients with manic depressive psychosis presented the lowest incidence of enuresis (12.4 per cent) as well as the smallest percentage of males among those who had enuresis. Persistence of enuresis was encountered in 35.7 per cent of the group with behavior problems. The triad association of male, psychopathic personality and enuresis seems worthy of serious consideration. Enuresis in its stubborn persistence reflects psychosomatically the lack of an internal inhibitory agent just as delinquency later reflects this lack sociopsychologically. Persistent enuresis is the prototype of the expression of deficient inhibitory tendencies, a weak ego and a reflection of an ill balance of the types belonging to the psychopathic personality, the delinquent and the psychiatric behavior problem. Its roots are embedded in the instinctual layer of the personality. It indicates faulty integration in the component levels of the personality and a lack of maturation. If enuresis is such a prophetic indicator of psychobiologic reactivity, the need for more intensive study of enuresis in the individual person is self apparent.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

23: 1-142 (Jan.) 1939

- *Treatment of Tabetic Lightning Pains with Thiamin Chloride: Preliminary Report. P. F. Metildi, Rochester, N. Y.—p. 1.
Studies in the Bismuth Therapy of Syphilis: I. Comparative Study of Toxicity and Therapeutic Activity of Bismuth Compounds Commonly Employed in Treatment of Syphilis. J. A. Kolmer, H. Brown and Anna M. Rule, Philadelphia.—p. 7.
Clinical and Experimental Evaluation of Sulfanilamide in Gonorrhea. A. Cohn, A. Jacoby, B. A. Kornblith and M. Wishegrad, New York.—p. 41.
Gonorrhea and Sulfanilamide: Effort Toward Clinical Orientation. P. S. Pelouze, Philadelphia.—p. 48.
*Reinfection (?) in Neurosyphilis. I. Kopp and H. C. Solomon, Boston.—p. 54.
Hemorrhagic Encephalitis in Pregnancy Following Antisyphilitic Therapy with Neosarsphenamine. S. S. Paley and N. Pleshette, New York.—p. 69.
Study of Sensitivity and Specificity of the Laugher Test as Compared with the Wassermann and Kahn Tests. H. W. Craig and J. L. Callaway, Durham, N. C.—p. 76.
Mapharsen as a Substitute for Neosarsphenamine in Agranulocytic Angina Following Neosarsphenamine Therapy in a Pregnant Syphilitic Woman. M. Goldberg, Brooklyn.—p. 79.
Alterations in Serum Proteins in Lymphopathia Venerea. Marion E. Howard, Anna J. Eisenman and M. J. Strauss, New Haven, Conn.—p. 83.
Massive Gangrene of the Skin in a Syphilitic Patient. H. Goodman, L. Oulmann, New York, and M. W. Buchbinder, Jamaica, Long Island, N. Y.—p. 97.

Thiamin Chloride for Tabetic Pains.—Metildi used thiamin chloride in the treatment of lightning pains of six tabetic patients in whom the tabes dorsalis process was not actively progressive. In each of these cases antisyphilitic treatment by standard methods had been ineffectual in relieving lightning pains. Thiamin chloride was given intramuscularly or intravenously. The patients were relieved of these pains either completely or in part in a few days after the injection of 10 mg. of thiamin chloride. The injections are being continued at weekly intervals. The period of observation is as yet too short to permit evaluation of the results.

Reinfection in Neurosyphilis.—Kopp and Solomon present a case of probable reinfection with syphilis in a patient who had neurosyphilis. The patient was continuously under observation in one clinic for eleven years. Numerous negative blood and spinal fluid examinations were obtained during this period. It is possible that reinfection occurred in this patient, who had developed early asymptomatic neurosyphilis while under active treatment for his first infection. Multiple chancres developed during the second infection.

Annals of Medical History, New York

1: 1-104 (Jan.) 1939

- The Faculty of Medicine of Paris: Historical Study of Its Origin and Its Influence Through Six Centuries to the Outbreak of the French Revolution. H. W. Jones, Washington, D. C.—p. 1.
The Origin of the Microscope. R. L. Haden, Cleveland.—p. 30.
Robert Adams, Surgeon, and His Contributions to Cardiology. J. B. Herrick, Chicago.—p. 45.
Brief History of Physical Diagnosis. H. M. Korn, Iowa City.—p. 50.
Circumcision. M. S. Jacobs, Philadelphia.—p. 68.
Ignatz Philipp Semmelweis: Outline for a Biography. I. I. Edgar, Detroit.—p. 74.

Canadian Medical Association Journal, Montreal

40: 1-104 (Jan.) 1939

- *Major Forms of Hereditary Ectodermal Dysplasia (with an Autopsy and Biopsies on the Anhydrotic Type). H. R. Clouston, Huntingdon, Que.—p. 1.
- Early Diagnosis of Cancer of the Stomach. L. J. Notkin, Montreal.—p. 8.
- Cystic Disease of the Urinary Tract Epithelium: Report of Case. N. W. Roome, London, Ont.—p. 13.
- *Intranasal Administration of Estrogenic Hormones in Constitutional Deafness. H. Mortimer, R. P. Wright, D. L. Thomson and J. B. Collip, Montreal.—p. 17.
- Improvements in Audiometry at the Montreal General Hospital. E. G. Burr and H. Mortimer, Montreal.—p. 22.
- Biochemical Study of Patients on Sulfanilamide Therapy. C. C. Lucas and D. R. Mitchell, Toronto.—p. 27.
- Pelvic Endometriosis: Report of Forty Cases. D. N. Henderson, Toronto.—p. 34.
- Diagnosis and Treatment of the Common Disorders of Menstruation. E. Shute, London, Ont.—p. 38.
- Etiologic Factors and Treatment of Carcinoma of Cervix. P. J. Kearns, Montreal.—p. 43.
- The Management of Diabetes Mellitus by the General Practitioner. A. MacKay, Toronto.—p. 48.
- Fors Clavigera in Anesthesia. W. Bourne, Montreal.—p. 52.
- Results of Phrenic Nerve Paralysis in Treatment of Pulmonary Tuberculosis. A. F. Miller and V. D. Schaffner, Kentville, N. S.—p. 55.
- Blood Culture as an Aid to Diagnosis of Carcinoma and Sarcoma. O. C. Gruner, Montreal.—p. 63.
- The Blood Sedimentation Rate in Anemia. H. Sugarman, Saskatoon, Sask.—p. 65.
- Absent Renal Vessels: Report of Two Cases. G. A. Winfield, Halifax, N. S.—p. 66.

Hereditary Ectodermal Dysplasia.—Clouston has made some additional observations on the hydrotic types of hereditary ectodermal dysplasia. He presents a chart showing that its severity is decreasing. The first four cases of the anhydrotic type of ectodermal dysplasia to be reported in Canada are cited with biopsy records and the third postmortem study is given. The condition is much more common than is usually believed. The distinctive marks are diminished sweating, dental aplasia and a rhinitis which has usually been called "atrophic." This is shown to be hypoplastic; the mucous glands of the nose and throat are diminished in number or absent. The resultant lack of defense and aeration, combined with loss of emergency temperature control, is probably a heretofore unrecognized cause of death in infancy. Recognition is not made because death occurs before the children are old enough to complain of the heat and before the distinctive dentition has occurred. Breast tissue was shown to be absent by the microscope. The question is raised as to what extent ozena is a hereditary ectodermal defect. It did respond to estrogenic substances. Evidence is given that the endocrine glands of ectodermal origin are involved in the general ectodermal dysplasia.

Estrogen Intranasally in Constitutional Deafness.—Mortimer and his colleagues report the results of the insufflation of estrogen intranasally in a series of fifty-five cases of constitutional deafness. Of the patients treated between July 1936 and September 1938 there are thirty-nine females and sixteen males. The cases were mostly diagnosed as either "otosclerosis" or "nerve deafness"; no attempt was made to select any given type of case. The patients range in age from the second to the sixth decade of life. Treatment consisted of daily nasal insufflation of 1 cc. of oil containing 1,000 international units of estrogen. None of the patients were treated for less than three months. Many of them have been under treatment for six months and there are some who have been treated intermittently for two years. As controls, eight males and six females have been observed. Before and during the treatment, at intervals of from one to two months, the hearing acuity in each ear of each patient was measured. Statistical examination shows that when all the data for 512, 1,024, 2,048 and 4,096 cycles are considered, the hearing of the treated males improves slightly while that of the untreated males deteriorates slightly. At these same frequencies the hearing of the treated females also improves slightly and of the untreated ones it appears to deteriorate. The high incidence of cranial dysplasia in 153 cases of constitutional deafness is discussed. The authors draw attention to the distribution of cranial types in this group and its similarity to the type of distribution in atrophic rhinitis and ozena. They suggest that

these two constitutional diseases may have a similar or even share a common constitutional background. This view, they believe, finds additional support in that the two constitutional defects coexist in the same individual and in the same familial stock more often than it is generally recognized (in such stock the two defects may be distributed through one generation or in successive generations) and in that treatment which acts specifically on the nasal disease is capable of producing not only marked improvement in certain individual cases of the aural defect but also a statistically significant amelioration in the hearing level of the constitutionally deaf. The authors do not imply that constitutional deafness is an endocrine disease.

Delaware State Medical Journal, Wilmington

11: 1-16 (Jan.) 1939

- Surgical Problems of Hyperthyroidism. I. S. Ravdin, Philadelphia.—p. 1.
- Injection Treatment for the Cure of Hernia. B. R. Veasey, Wilmington.—p. 7.
- Acute Retention of Urine in Single Kidneys. B. S. Vallett, Wilmington.—p. 8.

Journal of Pediatrics, St. Louis

14: 1-136 (Jan.) 1939

- Tetany in Newborn Infants: Relation to Physiologic Hypoparathyroidism. H. Bakwin, New York.—p. 1.
- Empyema in Children. S. Hurwitz and H. B. Stephens, San Francisco.—p. 11.
- *Mental Retardation Associated with Congenital Heart Disease: Study of Twenty-Two Cases. Mabel Ross, Baltimore.—p. 21.
- *Controlled Study of Pertussis Prophylaxis: Comparison of Phase I, Haemophilus Pertussis Vaccine with Undenatured Bacterial Antigen. Charlotte H. Singer-Brooks, San Francisco.—p. 25.
- Neurologic Complications of Whooping Cough: Review of the Literature with Reports of Two Cases of Pertussis Encephalitis. R. L. Nelson, Wichita Falls, Texas.—p. 39.
- Weill's Disease: Report of Case Occurring in a Child. E. E. Martner, Detroit.—p. 48.
- Niemann-Pick's Disease: Report of Three Cases in One Family. D. Merksamer and B. Kramer, Brooklyn.—p. 51.
- Röntgenologic Demonstration of Esophageal Varices as a Diagnostic Aid in Chronic Thrombosis of the Splenic Vein. H. M. Greenwald and M. G. Wasch, Brooklyn.—p. 57.
- *Anemia of Rheumatic Fever. J. P. Hubbard, Boston, and Margaret Harper McKee, Irvington, N. Y.—p. 66.
- Aerodynia Treated with Intramuscular Injections of Vitamin B. J. I. Durand, V. W. Spickard and E. Burgess, Seattle.—p. 74.
- Idiopathic Dilatation of the Common Bile Duct in Childhood. H. K. Berkeley, Los Angeles.—p. 79.
- Scrum Treatment of Meningococcic Meningitis. C. J. Leslie and A. G. De Sanctis, New York.—p. 83.
- Congenital Omphalocele: Report of Four Cases. J. L. Stein and A. Gerber, Brooklyn.—p. 89.

Mental Retardation with Congenital Heart Disease.—Ross points out that in the Harriet Lane Home those working in the cardiac clinic observed that many of the children with congenital cardiac lesions were often placed in special classes because of difficulty in school work. This observation led to a study of the incidence of mental retardation in patients with congenital heart disease. The cases studied were limited according to age (not more than 14 years) by the admitting rules of the Harriet Lane Home Dispensary and, in order to have a reasonable expectation of accurate results by the Binet-Simon intelligence tests, no child less than 5 years of age was included. Eleven boys and eleven girls ranging from 5 to 14 years of age were observed. Fifteen of these had been followed in the cardiac clinic, but the diagnosis was well checked in all. In these cases, patent interventricular septum (eight) and patent ductus arteriosus (six) were most common. The diagnosis was patent interventricular septum in four, pulmonary stenosis in two and valvular disease in one, and the pathologic condition was undetermined in one. None of the subjects fell in the idiot class but two had intelligence quotients below 50, seven fell in the moron group and eight were in the dull normal group. Only four were within the normal range of 91 to 110, and the highest of the group had an intelligence quotient of 117. There was no relation to the type of lesion, as the diagnosis in the two lowest and the one highest in the whole group was patent interventricular septum. This group was compared with a cross section of the Harriet Lane Psychiatric Dispensary patients, 1,000 cases. This group was felt to be fairly representative of the general outpatient population. The dull normal range was the same in all categories, but among those with congenital cardiac lesions the

more group was much larger and the normal group much smaller than in the outpatient population. The study appears to show that the intellectual endowment, as measured by the Binet-Simon intelligence tests, tends to be somewhat lower in the group suffering from congenital heart disease.

Pertussis Prophylaxis.—Singer-Brooks presents the results of pertussis prophylaxis obtained over a period of three years during which ninety-five children were injected with undenatured bacterial antigen, 272 children with phase I *Haemophilus pertussis* vaccine and 256 children were not protected and served as controls for treated groups. Of the ninety-five children injected with undenatured bacterial antigen thirty-four were exposed and in twenty-eight of these pertussis developed, making the attack rate 29.4 per cent. Of the children injected with phase I *Haemophilus pertussis* vaccine, forty-two were exposed to pertussis. *Haemophilus pertussis* infections developed in seven of these. The attack rate in this group was 2.5 per cent. Seventy-one of the control children were exposed to pertussis and in sixty-two of these attacks developed. The attack rate in the 256 control children was 24.2 per cent. The treated children have not been observed over a sufficiently long period to determine conclusively the duration of the protection conferred.

Anemia of Rheumatic Fever.—Hubbard and McKee observed the changes in the blood of seventeen patients with nineteen characteristic recurrences of rheumatic fever. All had well established rheumatic fever with cardiac complications. Their ages ranged from 5 to 16 years. None received any drugs which could be considered to have any bearing on the production of anemia. The patients were treated with the usual supportive measures including salicylates, diuretics and digitalis. Six of the exacerbations progressed to a fatal termination. All other patients were followed during their convalescence until the activity subsided. It was found that in association with the active phases of rheumatic disease a secondary anemia develops which is often quite severe. As the infection subsides, the blood levels tend to return to normal. Therefore the presence of anemia may often be an indication of continued rheumatic fever activity.

Military Surgeon, Washington, D. C.

S4:196 (Jan) 1939

- The Navy Today W D Leahy—p 1
The Medical Department of the Navy 1933-1938 and Its Plans for the Future P S Rosister—p 5
Dental Aspects of Preventive Medicine L C Fairbank—p 11
Therapeutic Value of Castor Oil and Magnesium Sulfate in Treatment of Acute Upper Respiratory Disease W A Smith and G F Baier—p 16
Transmission of Tularemia by the Fin Prick of a Catfish D H Miller—p 23
Practical and Brief Program for the Teaching of Chemical Warfare to a Medical Reserve Officers' Troop School H G Roller and L Goldman—p 29
Principles of Control of Fungus Disease of Feet in the Military Organization L Goldman—p 35
Incidence of Syphilis in 5,000 Recruits and Casual Soldiers R E Blount—p 40
Ruptured Appendix F J Vokoun—p 45
Efficacy of Cold Vaccine Investigation Conducted Among Soldiers C G Blitch and J F Doyle—p 46
Extract from Medical History of the Post Fort Monroe, Va. Rendered by G E Cooper, submitted by F M Hurtsock—p 52
The Life of Jonathan Letterman J M Phalen—p 62

S4:97192 (Feb) 1939

- Veterans Administration and Its Relation to National Defense F T Hines—p 97
Current Activities in the Medical Department Equipment Laboratory, Carlisle Barracks, Pa G L McKinney—p 105
Medical Department Lessons from the Fourth Army Maneuvers, 1937 D C Hilton—p 115
Observations on the Medical Department of the Japanese North China Expeditionary Force L A Fox—p 130
Soldier's Clothing S A Cohen—p 138
The Venereal Diseases United States Army H C Michie—p 146

Incidence of Syphilis in Army.—Blount points out that the Kline diagnostic and exclusion tests were performed on the serums of 5,000 army recruits and soldiers having previous service. All serums giving positive reactions were checked by the Wassermann and Kahn reactions. Sixty-one cases (1.2 per cent) of syphilis were found. The incidence varied from 0.52 per cent in recruits from 18 to 23 years of age to 5.5 per cent in those from 30 to 35 years old. In soldiers having previous

service the incidence varied from 1 per cent in those from 20 to 23 years old to 18.1 per cent in those from 42 to 59 years of age. However, few men between the ages of 42 and 59 years were examined. Soldiers with tropical service had a slightly higher incidence of syphilis than did those with service only within the continental borders of the United States. More than 50 per cent of the cases of syphilis found were so-called latent, but a relatively large number of cases of cardiovascular and cerebrospinal syphilis were found. The author believes that the examination of all recruits, as well as periodic surveys of the personnel of the army, would be of value to it.

Minnesota Medicine, St. Paul

22:71144 (Feb) 1939

- Advances in Prevention and Treatment of Contagious Diseases of Childhood L S Platon and P F Dwan, Minneapolis—p 71
Essentials in Diagnosis of Congenital Heart Disease T J Dry, Rochester—p 78
*Polyneuritis in Children R E Cutts, Minneapolis—p 89
What Is New in the Field of Food Sensitiveness W C Alvarez, Rochester—p 92
Type of Chronic Nervous Depression in Women Relieved by Administration of Thyroid Extract G R Kamman, St. Paul—p 97
Fracture of the Elbow and Volkmann's Ischemic Contracture H W Meyerding, Rochester—p 100
Practical Points in Anesthesia R T Knight, Minneapolis—p 105

Polyneuritis in Children.—Cutts states that the incidence of polyneuritis among the children of Minnesota is low but that the prolonged and severe disability requiring nursing care, physical therapy and, in some cases, orthopedic surgery make the condition an important one. The gross pathologic changes of polyneuritis are usually minimal although some swelling and congestion of the peripheral nerves may be detected. The symptoms of polyneuritis are usually both sensory and motor. Customarily the lower extremities are first involved, with progression to the upper extremities and trunk. The distribution is roughly symmetrical. General treatment during the active stage consists of supportive measures, elimination of foci and sources of toxin, improvement of nutrition, protection of the weakened muscles and the use of oxygen when the muscles of respiration are involved. As recovery progresses, physical therapy and orthopedic appliances are usually indicated. Surgery may be required to decrease disability when recovery has been incomplete. Specific measures are indicated when a specific cause can be determined. Metallic poisoning, either accidental or as a result of therapy, accounts for a considerable proportion of these cases. Of the metals the most frequent offender is lead. Lead may be ingested by children as a result of chewing paint from furniture and toys. Food and water may become contaminated from pipes or containers. Insecticides and sprays are other possible sources. The prognosis for complete recovery after lead polyneuritis is not as good as after most types because involvement of the spinal cord is generally greater. In the cases presenting evidence of lead encephalitis the prognosis is considerably worse. Arsenic, thallium and bismuth are other metals capable of producing polyneuritis. Cases of polyneuritis due to or associated with infections are less readily classified. That following diphtheria is considered the most common type in children. Diphtheritic polyneuritis is almost invariably preceded several days by local paralysis such as the paralysis of the soft palate and pharynx associated with faucial diphtheria. Neuritis occurs almost exclusively in cases in which antitoxin has been administered late or in inadequate dosage. A small group of cases has been reported in which neuritis developed several days after a brief febrile illness of undetermined origin. The polyneuritis in these cases is roughly symmetrical, usually associated with bilateral facial paralysis, frequently affecting proximal muscle groups of the extremities more than the distal groups. If the acute stage is survived, recovery is usually rapid and complete. Periarthritis nodosum is said to be accompanied by polyneuritis in 20 per cent of the cases. It occurs rarely and the neuritic symptoms are likely to be overshadowed by the other symptoms of the disease. Polyneuritis occasionally complicates other diseases: tuberculosis, typhoid, paratyphoid, malaria, septicemia, pyogenic infections, scarlet fever and mumps. Diabetes in children is rarely complicated by polyneuritis. Several drugs other than the metals mentioned have been cited as causes of polyneuritis. Among these are dimetrophenol, atabrine, sedatives of the chloral group and, rarely, anesthetics, including ether and

procaine hydrochloride. Occasional cases have been reported following the administration of foreign protein such as therapeutic serums. Hematoporphyrinuria and hematoporphyrin hydrochloride used therapeutically may also cause polyneuritis. Dietary deficiencies are known to be capable of causing neuritis. Until recently, massive doses and parenteral administration of vitamin B have not been practicable. Since vitamin B₁ is now available in pure concentrated form, information should soon be available concerning its use in the less common types of polyneuritis. Whether large doses of vitamin B₁ orally or parenterally will have any beneficial effects in the treatment of polyneuritis following diphtheria and the metallic and drug intoxications remains to be determined.

Nebraska State Medical Journal, Lincoln

24: 41-80 (Feb.) 1939

- Distortions Accompanying Congenital Single Lip Cleft. V. P. Blair, St. Louis.—p. 41.
Extension of Operability in Carcinoma of the Stomach. K. Meyer and P. Shapiro, Chicago.—p. 44.
Unnecessary Treatment in Mitral Valve Disease. A. L. Smith, Lincoln.—p. 49.
Therapy of Convalescent Human Serum. F. Clarke, Omaha.—p. 55.
Surgical Relations of the Thyroid Gland. M. Grodinsky, Omaha.—p. 58.
An Attack on Delinquency with a Discussion of "Active Play Therapy." J. H. Waterman and J. C. Nielsen, Ingleside.—p. 62.
Differential Diagnosis of Vesical Neck Obstruction. E. Davis, Omaha.—p. 66.
Eruption Due to Hydrophen Ointment: Case Report. D. J. Wilson, Omaha.—p. 70.

New England Journal of Medicine, Boston

220: 129-174 (Jan. 26) 1939

- Treatment of Chronic Alcoholism with Amphetamine (Benzedrine) Sulfate. W. Bloomberg, Boston.—p. 129.
The Control of Medical Science. M. V. MacKenzie, Boston.—p. 136.
Acute Hemolytic (Lederer's?) Anemia: Report of Case. T. H. McGavack, New York.—p. 140.
Disease of Besnier-Boeck-Schaumann. L. Babalian, Portland, Maine.—p. 143.
Popliteal Aneurysm: Report of Two Cases. A. R. Kington and E. R. Sanderson, Boston.—p. 146.
Syphilis. C. G. Lane, Boston.—p. 156.

New Orleans Medical and Surgical Journal

91: 335-402 (Jan.) 1939

- Gas Bacillus Infection, with Special Reference to the Therapeutic Value of the X-Rays. L. S. Charbonnet Jr. and R. W. Cooper, New Orleans.—p. 335.
Tumors of Adrenal Gland in Early Childhood: Report of Two Cases. A. R. Morgan, Crowley, La.—p. 345.
Elliott Treatment of Pelvic Inflammatory Diseases of Ambulatory Women: Analysis of Seventy-Three Cases. E. C. Smith, New Orleans.—p. 351.
*Serum Volume Test for Hemorrhagic Diathesis in Jaundice: Further Observations. F. F. Boyce and Elizabeth M. McFetridge, New Orleans.—p. 357.
Chronicity of Pulmonary Tuberculosis. S. Jacobs, New Orleans.—p. 364.
Advantages and Disadvantages of Cyclopropane Anesthesia. M. C. Beck, New Orleans.—p. 369.
The Thrombocyte in Allergy: Preliminary Report. N. F. Thiberge, New Orleans.—p. 372.

91: 403-462 (Feb.) 1939

- Subdeltoid Bursitis. P. A. McIlhenny, New Orleans.—p. 403.
Some Gynecologic Problems Occurring During the Reproductive Period. V. S. Counsellor, Rochester, Minn.—p. 407.
The Constitutional Psychopath as a Community Problem. T. H. Pargen, Jackson, La.—p. 413.
Myasthenia Gravis: Report of Case Treated with Oral Prostigmine. L. L. Cazenavette, New Orleans.—p. 417.
Dietetic and Insulin Management of the Juvenile Diabetic. P. H. Herron, Monroe, La.—p. 423.
Value of Bronchoscopy in Bronchiogenic Carcinoma. G. J. Taquino, New Orleans.—p. 429.
Radiologic Aspects of Bronchiogenic Carcinoma. A. D. Mayoral, New Orleans.—p. 436.
Bronchiogenic Carcinoma from the Bronchoscopic Aspect: Review of Some Recent Literature. H. L. Kearney, New Orleans.—p. 437.
Pathologic Aspects of Bronchiogenic Carcinoma. B. Halpert, New Orleans.—p. 439.

Serum Volume Test for Hemorrhagic Diathesis.—Boyce and McFetridge discuss the underlying causes of the hemorrhagic diathesis in jaundice with special reference to Quick's prothrombin theory. The procedure for carrying out their serum volume test for the diagnosis of the hemorrhagic diathesis in jaundice is given in an abstract in THE JOURNAL Jan. 8, 1938, page 158. Twenty-one cases of jaundice are reported, all of

which were studied by the serum volume test, the Ivy venous pressure test and the Quick hippuric acid test of hepatic function. The serum volume test proved correct in all cases, but the Ivy test did not. Since the serum volume test and the Quick hippuric acid test failed to correspond frequently, the authors ask whether depressed hepatic function can be invoked to explain all cases of bleeding in jaundice. They outline the preparation of jaundiced patients for surgery, referring especially to the use of blood transfusion, dextrose and vitamin K.

Physiological Reviews, Baltimore

19: 1-134 (Jan.) 1939

- Reaction of Muscle to Denervation. Sarah S. Tower, Baltimore.—p. 1.
Stuttering. S. Cobb and E. M. Cole, Boston.—p. 49.
Renal Tubular Excretion. J. A. Shannon, New York.—p. 63.
Physiology of Human Hair. C. H. Danforth, San Francisco.—p. 94.
Respiration in Diving Mammals. L. Irving, Swarthmore, Pa.—p. 112.

Southern Medical Journal, Birmingham, Ala.

32: 125-232 (Feb.) 1939. Partial Index

- Fracture and Fracture-Dislocation of the Astragalus. O. L. Miller, Charlotte, N. C., and L. D. Baker, Durham, N. C.—p. 125.
Management of Compound Injuries of Face and Jaws. J. B. Brown, St. Louis.—p. 136.
Roentgen Treatment of Carcinoma of Larynx and Hypopharynx. W. G. Scott and S. Moore, St. Louis.—p. 144.
*Use of Testosterone Propionate in Prostatic Hypertrophy. R. Bolend, Oklahoma City.—p. 154.
Conservative Management of Appendical Peritonitis. C. E. Gardner Jr., Durham, N. C.—p. 157.
Staphylococci Septicemia. P. F. Stookey and L. A. Scarpellino, Kansas City, Mo.—p. 173.
Further Observations on the Schiller Presumptive Test for Carcinoma of the Cervix. O. B. Hunter, Washington, D. C.—p. 179.
Pneoperitoneal Inversion of the Uterus. M. P. Rucker, Richmond, Va.—p. 197.
Review of Some of the Histogenetic Relationships of the Skin. M. T. Gaines, Mobile, Ala.—p. 202.
Present Status of Shock and Fever Therapy in Ophthalmology. S. C. Howell, Atlanta, Ga.—p. 208.
Histopathology of Sinusitis. P. J. Bayon, New Orleans.—p. 211.
Statewide Program in Health Education. H. H. Walker, Knoxville, Tenn.—p. 219.

Testosterone Propionate in Prostatic Hypertrophy.—Recently Bolend reported the results obtained with the use of testosterone propionate in twenty-three unselected cases of enlarged prostate with urinary retention. Ten patients are clinically well or symptom free, seven patients are improved and six experienced no improvement. Critical examination of the clinical data shows that, while ten patients are clinically well and symptom free, some of them carry from 5 to 35 cc. of residual urine. The patient giving the most striking clinical response has 130 cc. of residual urine. These patients, however, all consider themselves cured. In a later series of thirty-five patients the clinical course corresponds to the foregoing except that there was a higher percentage of beneficial results, owing to the fact that only patients with uncomplicated benign hypertrophy were treated. It has not been possible to demonstrate conclusively by palpation or by cystograms that the prostate is actually reduced in size. Hence, in his effort to determine how and why these patients are able to empty their bladders more completely, the author studied sections from the prostate of seven patients treated with varying amounts of the drug. Careful and accurate clinical data with biopsies before and after treatment were kept. Three changes were observed in the gland following treatment: (1) an exaggeration of glandular hyperplasia, (2) a reduction or at least no increase in the stroma and (3) a reduction in the inflammatory reaction. If there is any change in the individual epithelial cells, the change was not constant enough to be significant in the cases studied.

Surgery, St. Louis

5: 1-160 (Jan.) 1939

- Tumors of the Hands and Feet: Introduction. G. T. Pack, New York.—p. 1.
Carcinoma of the Hands and Feet. M. L. Mason, Chicago.—p. 27.
Subungual Melanoma: Differential Diagnosis of Tumors of the Nail Bed. G. T. Pack and F. E. Adair, New York.—p. 47.
Angiomatous Tumors of the Hands and Feet. A. W. Oughterson and R. Tennant, New Haven, Conn.—p. 73.
Tumors of Synovia, Tendons and Joint Capsules of the Hands and Feet. A. Brunschwig, Chicago.—p. 101.
Tumors Primary in the Bones of the Hands and Feet. B. L. Coley and N. L. Higinbotham, New York.—p. 112.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

35: 241-320 (Oct.-Dec.) 1938

Acute Intussusception in Children. C. P. G. Wakeley and F. R. B. Atkinson.—p. 241.

*Causation of Paralysis in Diphtheria. I. Taylor.—p. 250.

Chorea and Athetosis in Childhood. J. Shafar.—p. 259.

Exophthalmic Goiter in Children. F. R. B. Atkinson.—p. 267.

Cause of Paralysis in Diphtheria.—Taylor discusses some of the evidence bearing on the manner in which diphtheria toxin attacks the nervous system. The view held by some authors is that all forms of diphtheritic paralysis are due to hematogenous toxemia, the frequency with which certain nerves are attacked being explained by the selective affinity of the toxin for these nerves. The close anatomic relationship between the site of infection and the initial paralysis has led other observers to discard this theory in favor of extreme views of a different nature. They state that the toxin first attacks the nerves in the locality of the site of infection and that all other paralyses are produced by diffusion of toxin in the nervous system from the point of entry. This view receives some support from the orderly sequence of paralyses commonly noted in faucial diphtheria. The two schools of thought meet in the theories advanced by Walshe that (1) the initial paralysis is caused by lymphogenous invasion of the nervous system, the toxin passing from the site of infection to the central nervous system by the perineural lymphatics, (2) generalized paralysis is the result of hematogenous toxemia and (3) accommodation paralysis is the result of the selective affinity of circulating toxin for certain elements of the nervous system. Most clinicians and experimental workers are agreed that the late multiple neuritis following diphtheria, giving rise to diphtheritic pseudotabes, is due to hematogenous toxemia. The strongest evidence of the hematogenous origin of such paralyses is the fact that the experimental injection of diphtheria toxin intravenously in animals produces a multiple neuritis which is exactly comparable to this late form of peripheral neuritis found in diphtheria in the human being. In addition to the limb paralysis, accommodation paralysis must be included in the group of symptoms due to blood-borne toxin, because this form of paralysis is found quite frequently in both faucial and extrafaucial diphtheria. There are good grounds for believing that hematogenous toxemia is capable of producing, in addition to generalized paralysis, a type of paralysis similar to the local paralysis found in faucial diphtheria. The author believes that one may thus accept the possibility that blood-borne toxin may play some part in the production of local paralyses as they are encountered in faucial diphtheria. The close anatomic relation between the local paralysis and the site of infection can leave no doubt that the nervous system is primarily attacked by local absorption of toxin. Unilateral faucial diphtheria frequently results in paralysis of the corresponding side of the palate. An important and familiar clinical observation is what has been described as the "march of paralysis." One cannot but be impressed by the orderly way in which paralysis develops in most severe cases, palatal paralysis preceding pharyngeal and the diaphragm being involved before the intercostal spaces. Such a march suggests the slow spread of toxin in the central nervous system.

British Journal of Dermatology and Syphilis, London

51: 1-50 (Jan.) 1939

*Etiology of Seborrheic Dermatitis. G. B. Dowling.—p. 1.

*Id. G. H. Percival.—p. 7.

Reaction of Stools and Its Relation to Diseases of the Skin. R. Aitken.—p. 13.

Bazin's Disease. J. Kinnear.—p. 18.

Two Families Showing Hereditary Ectodermal Dystrophies. C. Hardwick.—p. 24.

Etiology of Seborrheic Dermatitis.—Dowling states that the cause of seborrheic eczema is not established but that the available evidence points to a primary infection with yeastlike organisms, usually saprophytic but capable of developing varying degrees of pathogenicity under different conditions. Why some cases are fixed and stationary while others are acute is

not always easy to explain, but there can be little doubt that these variations depend on a number of factors. Seborrheic eczema in its pure form often undergoes alteration owing to pyococcal invasion or to numerous local and constitutional factors. These secondary changes may so alter the clinical picture that the diagnosis of the original dermatosis may be a matter of guesswork. One has to depend largely on the presence of a certain number of typical lesions, the characteristics of which Darier has described.

Etiology of Seborrheic Dermatitis.—Percival separates seborrheic dermatitis into three groups: (1) pityriasis capitis and czematoid lesions affecting the hairy or potentially hairy regions, (2) flexural dermatitis, which is almost always exudative, and (3) pustular dermatitis affecting areas covered with strong hair. He summarizes the evidence which has a bearing on the etiology of cases labeled "seborrheic dermatitis" into the following: 1. An almost specific type of organismal infection is associated with each case group and clinical observation of the course of the eruptions and their response to treatment suggests, even in the absence of scientific corroboration, that infection plays a definite part in their production. 2. In all three case groups a type of eczematous reaction, which is distinct for each group and which is different from the eczematous reaction produced by chemical irritation, is a characteristic and diagnostic feature of the eruption. 3. The clinical features, bacteriologic findings and response to treatment in the three groups of cases are so distinctive that each group stands out clearly as an individual clinical entity. In the absence of definite proof the author suggests that an external infective origin should be presumed temporarily for all three groups. Furthermore, the same presumption might be extended to include infectious eczematoid dermatitis, and in descriptive nomenclature this group might be placed in the same class.

Indian Medical Gazette, Calcutta

73: 713-776 (Dec.) 1938

Follow-Up of a Mass Treatment with Injectable Atabrine. A. T. W. Simeons.—p. 713.

Enumerative Studies in Benign Tertian Malaria. V. Sivalingam.—p. 715.

*Use of Cobra Venom in Nerve Leprosy. J. S. Chowhan and R. N. Chopra.—p. 720.

Investigation and Conservative Treatment of the Nasal Factor in Asthma. F. T. Harrington.—p. 725.

Hobbs Treatment with Glycerin Applied to Male Urethra in Gonorrhea.

R. L. Raymond, K. K. De and U. Soe Nyun.—p. 729.

Induction of Labor. G. P. Charlewood.—p. 733.

Report of a Case of Early Acquired Syphilis in a Patient with Tertiary Stigmata of Untreated Yaws. R. V. Rajam.—p. 735.

Treatment of Animals with Antirabic Vaccine. R. O. A. Smith, J. P. McGuire, E. D. Stephens and B. N. Lahiri.—p. 736.

Cobra Venom in Nerve Leprosy.—The nerves most frequently involved in leprosy are the ulnar, peroneal, posterior tibial and median. These nerves were thickened and painful in nearly all the cases that Chowhan and Chopra observed. Injections of cobra venom relieved the severe nerve pains due to lepra reaction. In some cases injections were given locally to relieve pain of a particular part of the body, which was interfering with the sleep of the patient. It had been suggested that relief of nerve pain and other nerve symptoms in leprosy, after cobra venom, is due to its choline esterase-like action. In persons suffering from severe and constant nerve pains, there is probably an excess of acetylcholine in tissues produced by pathologic overstimulation of nerves and possibly the choline esterase normally present is insufficient to neutralize it. Since injections of cobra venom relieved nerve symptoms it is possible that it acted by neutralizing the excess of acetylcholine present. It is also possible that cobra venom may itself act like choline esterase or may have a substance of this nature present in it. The study of the biochemical changes in the blood of patients with leprosy before and after the injections of cobra venom is in progress, particularly its effects on choline esterase. It is not expected that cobra venom will ever replace chaulmoogra oil and other measures in the treatment of the nerve type of leprosy, but it may serve as an additional weapon in ameliorating some of the troublesome symptoms. From 60 to 70 per cent of cases of leprosy in India are of the

nerve type. Cobra venom has been shown to give marked relief in from 60 to 80 per cent of these cases, particularly if the injections are given into the macular and anesthetic patch. The sensations of numbness and formication are also improved. The relief of pain was observed after the second or third injection and the pain disappeared almost completely after the fifth or sixth injection. The criteria of improvement were the return of normal sensations and less disturbed sleep. Mixed injections of vitamin B₁ and cobra venom have resulted in definite benefit in a few cases of neuritis which did not improve with cobra venom alone. Vitamin B and cobra venom if used together would most probably be highly beneficial therapeutic agents in neuritic leprosy.

Medical Journal of Australia, Sydney

2: 1103-1144 (Dec. 31) 1938

Sulfanilamide. Beatrix Durie.—p. 1103.

Use of Sulfanilamide in Some Clinical Conditions. J. Chesterman.—p. 1110.

Q Fever: Factors Affecting the Appearance of Rickettsiae in Mice. F. M. Burnet and M. Freeman.—p. 1114.

Observations on Vulvovaginitis in Children. N. M. Gibson and C. J. Wiley.—p. 1116.

Spermatorrhea in Trichosurus Vulpecula and Other Marsupials. A. Bolliger and A. L. Carrodus.—p. 1118.

Blackwater Fever Following the Administration of Atabrine. C. E. M. Gunther.—p. 1119.

*Method of Giving Blood Transfusions to Infants. V. L. Collins.—p. 1121.

Blood Transfusions in Infants.—Collins describes a method of giving blood transfusions to infants which makes use of the malleolar vein. A needle with a stilet as a cannula, blood taking apparatus, rubber tubing with a lumen of 4 mm. and a record syringe with a three-way stopcock supply are the apparatus needed. The needle with a stilet renders the cannulizing of even a small vein a simple procedure. It is an ordinary large hypodermic needle (gauge 18, 24 mm. in length by 1.2 mm. in thickness) shortened to 20 mm. The stilet projects 4 mm. beyond the end of the needle, which is cut straight across and beveled round its circumference so that it tapers to the stilet. One piece of rubber tubing, 25 cm. long, runs from the stopcock to the adapter, which fits the needle. A second piece of tubing, 30 cm. long, connects the stopcock to the vessel containing compatible citrated blood. The infant's foot is bandaged to a splint, the position of the malleolar vein is noted and under local anesthesia a transverse or oblique incision is made across the line of the vein just proximal to the medial malleolus. By placing a pair of Spencer-Wells forceps in the wound and opening them in a plane at right angles to the incision, the subcutaneous tissues can be opened as deep as the periosteum. When the periosteum is bared, the vein can be mobilized with an aneurysm needle, and two pieces of catgut passed beneath it in the customary manner. With fine scissors the vein is then cut half across, and the needle and stilet are introduced. The record syringe is attached to the stopcock and the rubber tubing is connected to the flask of blood. The tap is adjusted and blood is drawn into the syringe. Then the tap is turned on and any air in the syringe is expelled through the tube. As soon as blood is dropping from the adapter in this tubing, the stilet is removed and the adapter is fitted into the needle in the vein. The small amount of air in the needle can be ignored. The blood is then gently forced into the vein, and by refilling the syringe and adjusting the stopcock each time the desired amount of blood can be given. When the transfusion is completed, the pieces of catgut surrounding the vein should be removed and a dressing applied. A horsehair suture is rarely required for the incision. The amount of blood and the rate at which it is given depend on the circumstances. Usually it is desirable to take from twenty to thirty minutes to give 90 cc. of blood to an infant weighing 2.7 Kg. (6 pounds). In larger infants it is more satisfactory to transfuse blood by the continuous drip method, but this is not always possible when the veins are small. The author states that the method described has been found so satisfactory for intravenous therapy that it is now used throughout his hospital for all blood transfusions and the intravenous administration of saline solution. A slightly larger needle is used for continuous transfusion.

Journal de Chirurgie, Paris

53: 161-304 (Feb.) 1939

Parathyroid Osteosis: Case. P. Moulouguet and J.-A. Lièvre.—p. 161.
Sinusaroid Enervation: Technique, Indications, Results. L. Léger.—p. 176.

*Surgical Treatment of Diabetes. J. Bréhant.—p. 195.

Surgical Treatment of Diabetes.—Bréhant says that the attempts at surgical cure of diabetic conditions are only in their beginnings. The medical treatment looks only to substitution for the deficient pancreatic function by the application of endocrine therapy; the surgical treatment aims to modify the relation between the two neurohumoral systems, which regulate the sugar metabolism and assure glyceic equilibrium. These two systems are: (1) the apparatus aiming at hypoglycemia, which consists of the pancreatic islands, the secretion of which is dependent on the pneumogastric nerve, and accessorially of certain endocrines such as the salivary glands and the parathyroids; (2) the apparatus acting in the hyperglycemic direction, which consists of the adrenal medulla, the secretion of which is dependent on the splanchnic nerves, and secondarily of certain endocrine glands such as the hypophysis and the thyroid. The surgical attempts that have been carried out thus far have aimed either at the strengthening of the vagopancreatic apparatus or its connected glands or at the depression of the adrenosplanchnic apparatus and its connected glands. The attempts at activation of the pancreatic function so far have given deceptive clinical results. Pancreatic transplantation is not feasible in human subjects. Sympathectomy of the arteries of the pancreas so far has only formed a part of the experimental sphere. Moreover, the attempts at transformation of the pancreas into a gland that is only endocrine, by alteration of the external function, have not given reliable clinical results. Among the attempts aiming to modify the endocrine status of the accessory glands, the only ones which rest on approved physiologic bases are the attempts of hormonal activation of the salivary glands or of the inhibition of the hypophysial apparatus. The first ones have not given appreciable clinical results; those of the second group were more encouraging, but the seriousness of hypophysectomy prevents the practiced application of a surgical intervention on this gland. There remain the attempts at the suppression of the adrenal apparatus. Rather than to attack directly the adrenal gland, the attempts thus far tend to rely to a certain extent on the operations of glandular enervation and in particular on splanchnicectomy. These attempts are sufficiently encouraging to be considered worthy of a trial in grave forms of diabetes that are resistant to insulin.

Presse Médicale, Paris

47: 153-176 (Feb. 1) 1939

*Accidents of Skiing: Their Genesis, Frequency and Distribution. J. Braine and C. Goury.—p. 153.

Facio-cervicothoracobrahcial Neuralgic Syndrome Probably of Sympathetic Etiology. J.-A. Chavany.—p. 156.

Accidents of Skiing.—Braine and Goury point out that the technique of this sport has been specified and improved during recent years. Regarding the accidents that occur in the course of skiing, they say that in view of the large number of persons who do use skis the frequency of the accidents is relatively slight, other snow sports, such as tobogganing and bobsleighbing, being much more dangerous. Statistics which are difficult to establish are deceptive; the seriousness of the accidents differs greatly and many of the minor lesions (small muscular and ligamentous ruptures and mild sprains), which constitute the majority of accidents, escape medical control. Accordingly, the authors cite figures with certain reservations. The incidence of skiing accidents is 0.5 per thousand. In the region of Freiburg, with more than 2,000 skiing students every Sunday during the winter, fourteen fractures and 160 sprains have been counted during one season. In the region of Innsbruck, 157 accidents, of which eighty-seven were fractures, have been counted in one year. After citing figures on the percentages of the serious, moderate and mild accidents, the authors give their attention to the etiology, pointing out that it depends on the equipment, the skiing terrain, the physical condition of the skier and the type of skiing. In estimating the equipment, the authors describe and illustrate the boots, the sticks and

their correct and incorrect attachment to the hand, and the different types of bindings, that is the devices by which the skis are attached, and so on. They also illustrate how the sticks may eventually cause dislocation of the shoulder. Discussing the role of the skiing terrain in accidents, they say that the frequency and the type of accidents, as well as the localization and the character of the traumatic lesion, are largely determined by the condition of the snow. Its quality varies according to the season. Especially dangerous is the snow at the beginning of the season and in the spring. Moreover, the consistency of the snow varies from day to day. Recently fallen snow may obscure obstacles. The physical condition of the skier and his training are also important factors in the etiology of accidents, for traumas are most frequent at the beginning of the season. That the type of skiing plays a part in the causation of accidents is proved by their high frequency in going down slopes and in mountain skiing. In skiing on level ground accidents are comparatively rare. In the last part of this report the authors give figures on the characteristic lesions that occur in skiing. The therapy of these lesions they intend to discuss in a later report.

Schweizerische medizinische Wochenschrift, Basel

69: 117-140 (Feb. 11) 1939. Partial Index

Causes of Accidents in Skiing. M. Petitpierre.—p. 117.
Morphology and Function of Bone Marrow in Osteopathies. N. Markoff.—p. 120.

*Neuromuscular Impairment of the Young of Rats with E Hypovitaminosis and Their Treatment with Synthetic Vitamin E. V. Demole and H. Pfaltz.—p. 123.

*Calcium and Training of Athletes. P. Martin.—p. 125.

Neuromuscular Impairment of Young of Rats with E Hypovitaminosis.—Demole and Pfaltz show that the young of rats with E hypovitaminosis frequently develop neuromuscular lesions during the period of lactation. Symptoms of these lesions are laziness, awkwardness, paresis, paralysis and convulsions. The administration of synthetic *dl*-alpha-tocopherol as well as of its acetyl ester during the first half of the period of lactation (up to fifteen days after birth) either to the mother animal or to the young prevents the appearance of these disturbances. If the tocopherols are administered during the second half of the period of lactation, existing mild disturbances such as awkwardness and pareses are cured but complete paralysis is not influenced.

Calcium and Training of Athletes.—Martin reports his studies on the influence of calcium therapy during the training of athletes. The young athletes who were the subjects of the experiments were mostly city dwellers who lived in modest circumstances and whose food was frequently deficient in calcium salts. Moreover, working in offices during the day, they had little opportunity to benefit from fresh air and sunshine. Before describing his experiments the author reviews some aspects of the physiologic and biologic role of calcium. Following this he cites several authors who employed calcium in treating athletes. His own experiments aimed to answer the question whether the administration of calcium permits the progressive intensification of training without producing the signs of excessive training. The tests were made on young runners (400 meters). Of a group of twenty-seven athletes, fifteen underwent training without calcium therapy; the other twelve were subjected to intensive calcium therapy during the five months of training (December to April). They were given daily two tablets of calcium gluconate or an equivalent amount of calcium in some other form. The author gives tabular reports of the results of the tests at the onset and at the end of the period of training. Recapitulating the results he says that the amelioration of the coefficient of fatigability (difference between the pulse rate on arrival after the 400 meter run and the normal pulse rate) was 60 per cent higher in the athletes who had received calcium than in those who had not received it. The improvement of the coefficient of rapidity of recuperation to the normal state (difference between the pulse rate ten minutes after finishing the run and the normal pulse rate) was 33.7 per cent better in the athletes who had received calcium therapy. The athletes tolerated the administration of calcium well. There were no complaints about difficulties in the absorption of the medicament. On the contrary, they felt the beneficial effect on their general condition.

Rivista di Patologia e Clin. d. Tubercolosi, Bologna

13: 1-80 (Jan. 31) 1939. Partial Index

Origin of Insatiable Pneumothorax: Experiments. G. Baldacci.—p. 1.
Declive Posture in Therapy of Pulmonary Tuberculosis. D. D'Arcangelo and T. Todoroff.—p. 7.

*Influence of Parapneumothoracic Pleurisy on Contralateral Tuberculosis. N. Cavarozzi.—p. 21.

Parapneumothoracic Pleurisy in Contralateral Tuberculosis.—Cavarozzi's work was meant to determine whether parapneumothoracic pleurisy has an influence on the evolution of contralateral tuberculosis and what the mechanism of action of that influence is. The author followed the behavior of the contralateral lung before development and after recovery or improvement of typical, abundant and noncomplicated parapneumothoracic pleurisy in fifty-seven adults. Before development of pleurisy the contralateral lung was normal in eight cases. In the remaining forty-nine the structure showed clinical symptoms and x-ray changes varying from conditions of adenopathies or tuberculous infiltrations to different forms of tuberculosis. Collapse of the pneumothoracized lung was clinically efficient in ten cases, including those in which the contralateral lung was normal. After parapneumothoracic pleurisy the clinical symptoms and the roentgenograms of the contralateral lung were unchanged in twenty-five cases, including those in which the structure was previously normal. There was regression of tuberculosis in sixteen cases and aggravation of the disease in sixteen cases. The author found that behavior of the contralateral lung parallels that of the pneumothoracized structure in all cases unless the pleuritic fluid is infectious. In the presence of clean pleuritic fluid (either spontaneous or from thoracentesis and lavages) the contralateral lung does not change in most of the cases or it shows regression of tuberculosis. In these cases pleurisy follows a favorable evolution, and prompt recovery of the patients results. Aggravation of contralateral tuberculosis after parapneumothoracic pleurisy is observed in cases in which the pleuritic fluid is purulent or suppurative. However, the evolution of the condition is modified if the fluid is transformed from purulent to clean by proper treatment. According to the author, parapneumothoracic pleurisy has a mechanical action on collapse and a toxic and infectious action on the general system with a consequent indirect action on the contralateral lung. The nature of the action is biologic and infectious as the changes of collapse interfere with the control or stimulation of tuberculosis of the pneumothoracized lung, and the acute infectious nature of the fluid disturbs directly the general trophism.

Zeitschrift für Kinderheilkunde, Berlin

60: 285-466 (Dec. 19) 1938. Partial Index

Electrocardiography in Nurslings. A. Nádrai.—p. 285.

Therapy and Prophylaxis of Rickets with Single Large Dose of Vitamin D₂ and D₃. H. Brockmann.—p. 359.

Experimental Studies on Whooping Cough (Blood Picture, Sedimentation Reaction of Blood, Encephalitis). W. Camerer.—p. 371.

Behavior of Blood-Cerebrospinal Barrier in Experimental Poliomyelitis. M. Kasahara, T. Kakusui and Sha-Shi-Nan.—p. 391.

Occurrence of Enterobius Vermicularis in Appendixes Removed by Surgery or Obtained in Postmortem Examinations. O. Fusthy.—p. 394.

Acute Hemolytic Anemia (Type Lederer). W. Brenner.—p. 405.

*Susceptibility to Serum Disease. A. Beer.—p. 418.

Subarachnoidal Hemorrhage During Childhood. E. Engelhardt.—p. 436.

Susceptibility to Serum Disease.—By the statistical analysis of a large material, Beer aimed to detect fluctuations in the susceptibility to serum disease. He determined the incidence of serum disease in the cases in which treatment with diphtheria horse serum was administered during the twenty years from 1916 to 1935. He observed an increase in the percentage of serum disease during the spring months, more exactly during May and June compared to March and April. This increase he regards as the result of the general alteration in reactivity to which the organism is subject at this time of the year. There was no definite evidence of changes in the susceptibility in connection with the different ages of the patients; to be sure, the figures seemed to indicate with some probability that there was a greater susceptibility to serum disease during the first three or four years of life. However, this evidence was not sufficiently convincing to justify the drawing of conclusions. The author gave attention also to the articular complications of serum dis-

ease and observed an indisputable augmentation of their incidence corresponding to the increasing ages of the patients; moreover, he noted that the reactions on the part of the joints became manifest earlier in the older children and that the late articular complications (later than sixteen days after the injection) became rare in children over the age of 7 years. The author considers that these fluctuations in the type of articular involvement are the result of the progressive development of the joints.

Klinicheskaya Meditsina, Moscow

16: 1605-1772 (No. 12) 1939. Partial Index

- *Controversial Points in Teaching of Rheumatic Disease of the Heart. Ya. G. Etinger.—p. 1609.
Fate of Syphilitic Patients from Ten to Forty Years After Infection. B. N. Zilberman.—p. 1626.
Differential Diagnostic Errors in Recognition of Tuberculosis. T. D. Kan.—p. 1632.
Correlation of Some Cardiovascular Reactions in Croupous Pneumonia. I. S. Shnitser.—p. 1641.
Venous Pressure in Croupous Pneumonia. D. N. Prudnikov and V. V. Bazhenov.—p. 1647.
Intravenous Alcohol Therapy of Croupous Pneumonia. T. S. Mnat-sakanov.—p. 1654.

Rheumatic Disease of the Heart.—Valvular lesions of the heart of nonsyphilitic origin, according to Etinger, are associated as a rule with rheumatic infection regardless of history of previous attacks of inflammatory disease of the joints. The etiologic identity of the so-called arthritic valvular lesions of the heart, as well as of those not associated with involvement of the joints, has been established by anatomic and clinical studies. The clinical diagnosis of rheumatic endocarditis is possible only on the demonstration of functional valvular derangement, which is possible during the acute period in relatively few cases. The question of the myocardial or endocardial origin of a systolic murmur heard in the apex in the acute stage of rheumatism has not been solved. The author stresses the point that regardless of the mechanism determining this murmur it does not necessarily point to a later development of the valvular lesion. In his experience not less than 50 per cent of such murmurs disappeared in a later course. Diagnosis of the involvement of the bicuspid valve is possible only after the lesion has been established some time after the attack. The recognition of the aortic lesion is not infrequently possible during the acute period on the basis of the diastolic murmur. Definite diagnosis of a mitral lesion is possible not earlier than one year after an attack of rheumatic arthritis. Its determining clinical syndrome is the appearance of a pre-systolic murmur, which indicates the beginning stenosis of the mitral opening. The progressing sclerosis of the involved valvular apparatus is conditioned not so much by the rheumatic flare-ups as by overwork and functional strain. The incidence of cardiac lesions in connection with recurrent attacks of joint inflammation is about the same as that associated with the first attack; thus rheumatic patients who have suffered one, two and more arthritic attacks are not guaranteed from developing valvular lesions in subsequent attacks. The absolute number of lesions arising in connection with recurrences is relatively small when compared with lesions arising in the prearthritic period or in connection with the first arthritic attack, which is explainable on the basis of diminishing frequency of recurrences with each attack as well as with diminution of the percentage of rheumatics with intact valvular apparatus with each consecutive joint attack. The author stresses the high incidence of valvular lesions in the prearthritic period. In his series of 420 patients entering the hospital in the course of the first involvement of the joints eighty-one, or 19.3 per cent, presented an old valvular lesion. Analysis of the author's material indicates a small percentage of involvement of the mitral valve alone (from 3 to 4 per cent) as well as a relatively rare incidence of isolated lesions of the aortic valves. The incidence of combined valvular lesions amounted to 40 per cent. This rate increases with each new flare-up of the joints. The author stresses the regular development of myocarditis in association with rheumatism as well as the fact that the recurring specific myocarditis frequently is the determining factor in the fate of rheumatic patients by provoking or increasing the cardiac insufficiency.

Nederl. Tijdschr. v. Verlosk. en Gynaec., Haarlem

41: 177-305 (Nos. 3-4) 1938

- Influence of Untreated (Latent) Syphilis on Course of Pregnancy in Chinese Women. L. P. Kian.—p. 177.
*Tetany and Pregnancy. J. C. Verhage.—p. 201.
Transplantation of Uterine Mucosa. M. A. van Bouwdijk Bastiaanse.—p. 232.
Congenital Tuberculosis in Man and Animals. L. P. H. J. de Vink.—p. 243.
Position of Fetus in Uterus. D. G. Wesseling.—p. 252.

Tetany and Pregnancy.—According to Verhage, tetany is comparatively rare during pregnancy; at any rate this is the case if the atypical forms, without spontaneous convulsions, are disregarded. He reports two cases of tetany in pregnant women. In the first woman the tetany developed following a strumectomy that was performed eight days after the birth of the woman's third child. After this the woman became entirely well. She had no symptoms of tetany until she became pregnant. These symptoms subsided after the pregnancy was terminated but recurred again three years later when the woman became pregnant once more. The second woman developed tetany during pregnancy although she had not undergone an operation. However, the anamnesis disclosed that she had had symptoms of tetany ten years before, about six months before the menarche. In both cases the authors succeeded in counteracting the symptoms and in increasing the calcium content by means of parathyroid extract. However, normal calcium values were not reached before delivery. When after delivery the same therapy was continued, the calcium content increased further. In both instances the calcium content of the blood was considerably higher in the child than in the mother. However, when the calcium content of the maternal blood was extremely low, that of the blood of the child was likewise below normal. The anemia which accompanied the tetany yielded to treatment with reduced iron and, as the anemia improved, the calcium content of the blood increased. In a general discussion of the problem of tetany in pregnancy the author takes up the symptomatology, pathogenesis, prognosis and therapy. He shows that tetany must be regarded as a serious complication during pregnancy and during the puerperal period, although, thanks to the new forms of treatment (parathyroid extract and dihydrotachysterol), its prognosis has greatly improved in recent years.

Acta Chirurgica Scandinavica, Stockholm

81: 405-583 (Jan. 13) 1939. Partial Index

- Hematuria and Renal Calculus as Complication After Appendectomy. H. F. Harbitz.—p. 405.
Ectopia Renis with Hydronephrosis and Carcinomatous Degeneration: Case. O. Odén.—p. 425.
*Clinical and Experimental Studies on Intestinal Paralysis in Extra-Abdominal Traumatic Injury to the Trunk. K. Lehmann.—p. 439.
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Intestinal Paralysis in Extra-Abdominal Traumatic Injury.—According to Lehmann, traumatic injury involving the abdomen directly, especially with injury to intra-abdominal organs or hemorrhage, may produce intestinal paralysis. It is more difficult, however, to explain how extra-abdominal traumatic injury which is limited to the back, chest or pelvis can give rise to typical ileus. Some cases of serious paralytic ileus in traumatic injury to the back, including one with fatal outcome, gave rise to the studies here presented. In order to get some idea of the frequency of this traumatic form of ileus, the author investigated a material of 497 cases of extra-abdominal traumatic injuries limited to the region of the back, chest, pelvis and kidney. In this number eleven were found to be associated with more or less pronounced paralytic ileus. One case terminated in death. On the basis of the postmortem observations in this case, of the localization of the trauma in other cases and of experimental studies, the author suggests that the intestinal paralysis is due to an inhibiting action on the intestinal musculature. This effect is exerted by the sympathetic, which in turn is impaired by the formation of a hematoma. In eight of the eleven reported cases the hematoma was localized in the region of the splanchnic nerves, more especially on their intrathoracic course.

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THE EFFECT OF RADIATION THERAPY ON GASTRIC SECRETION

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In this article we wish to describe certain effects of radiation therapy on gastric secretion in man. The studies were made on patients with peptic ulcer and with the therapy of ulcer in mind. This report, however, deals primarily with the effect on gastric secretion, because other methods of ulcer treatment were used in conjunction with x-rays and because a reliable appraisal of the therapeutic procedure is as yet premature.

Bruegel¹ in 1917 reported the production with radiation therapy of a temporary achlorhydria as measured by means of the usual test meals in vogue at that time. Bensaude² in 1925 described a decrease in acidity in six of eleven patients. Viviani³ studied the effect of radiation on histamine secretion in 1931, reporting a definite depression, variable both in extent and in duration. Emery⁴ in 1932 noted a temporary achlorhydria in four cases. The amount of therapy employed by these workers and the technic used varied greatly. Experimentally, Miescher⁵ in 1923 found a moderate but temporary reduction in secretion in a dog after each of two courses of therapy. Portis and Ahrens⁶ in 1924 produced complete achlorhydria in one dog with a Pavlov pouch and almost complete achlorhydria in another. Ivy, McCarthy and Orndoff⁷ in 1924, Case and Boldyreff⁸ in 1928, Snell and Bollman⁹ in 1934 and Visscher¹⁰ in 1937 described a variable and temporary reduction in gastric secretion in the dog following irradiation.

From the Department of Medicine and the Division of Roentgenology of the University of Chicago.

1. Bruegel, C.: Die Beeinflussung des Magenchemismus durch Röntgenstrahlen, München, med. Wchnschr. 64: 379, 1917.

2. Bensaude, R.; Solomon, I., and Oury, P.: Roentgen Rays in Gastric Disease, Presse méd. 33: 841 (June 24) 1925.

3. Viviani, Rodolfo: Influenza di radiazioni X sulla secrezione gastrica da istamina in soggetti normali ed in gastropazienti, Radiol. med. 18: 723 (June) 1931.

4. Emery, E. S., Jr.: Peptic Ulcer: Its Treatment by the Roentgen Ray, New England J. Med. 206: 717 (April 7) 1932.

5. Miescher, G.: Ueber den Einfluss der Röntgenstrahlen auf die Sekretion des Magens, Strahlentherapie 15: 253, 1923.

6. Portis, S. A., and Ahrens, Robert: The Effects of the Shorter Wavelength Roentgen Ray on the Gastric Secretion of Dogs, Am. J. Roentgenol. 11: 272 (March) 1924.

7. Ivy, A. C.; McCarthy, J. E., and Orndoff, B. H.: Studies on the Effect of Roentgen Rays on Glandular Activity, J. A. M. A. 83: 1977 (Dec. 20) 1924.

8. Case, J. T., and Boldyreff, W. N.: Influence of Roentgen Rays upon Gastric Secretion, Am. J. Roentgenol. 19: 61 (Jan.) 1928.

9. Snell, A. M., and Bollman, J. L.: Gastric Secretion Following Irradiation of the Exposed Stomach and the Upper Abdominal Viscera by Roentgen Rays, Am. J. Digest. Dis. & Nutrition 1: 164 (May) 1934.

10. Visscher, Maurice: Personal communication to the authors.

There is an increasing amount of evidence that acid gastric juice plays a most important role in both the pathogenesis and the healing of peptic ulcer or, to use Dragstedt's¹¹ term, "acid ulcer." No attempt will be made at this time to present the evidence for this point of view, but it is of interest in this connection to note that Miescher⁵ twice observed the healing of a cutaneous ulcer adjacent to the stoma of a Pavlov pouch when the secretion from the pouch decreased as the result of irradiation. The great problem of therapy seems to be that of achieving more complete, more constant and more permanent neutralization or inhibition of the acid secretion. The excessive, continued night secretion appears to play an especially important role in the failure of ulcers to heal. Any method of depressing gastric secretion, therefore, seems to us worthy of investigation.

The potential dangers of radiation therapy have been emphasized by several investigators and were well recognized by us. In 1919 Hall and Whipple¹² called attention to the sensitiveness of the mucosa of the small intestine to irradiation and described the epithelial injury and necrosis resulting therefrom. The observation was subsequently confirmed by Denis and Martin,¹³ Martin and Rogers,¹⁴ Ivy and his associates⁷ and other workers. Wetzel¹⁵ in 1921 described the case of a cachectic woman aged 68 with gastric carcinoma in whom, after two courses of radiation therapy, there was found at autopsy a defect in the anterior wall of the stomach, peritonitis and regional necrosis of the left lobe of the liver, even though there was no change microscopically or grossly in the overlying skin. Case and Warthin¹⁶ found degenerative and necrotic hepatic lesions at autopsy in three cases of carcinoma of the stomach in which intensive radiation therapy had been given. In recent years, however, one of our associates, Dr. Alexander Brunschwig, has had a rather wide experience in the radiation treatment of malignant disease and has found that, on the whole, the abdominal viscera can tolerate fairly large doses quite well. We therefore decided to study the effect of a large but, in our experience, safe dose of radiation on gastric secretion in man.

11. Dragstedt, L. R.: Ulcus Acidum of Meckel's Diverticulum, J. A. M. A. 101: 20 (July 1) 1933.

12. Hall, C. C., and Whipple, G. H.: Roentgen Ray Intoxication: Disturbances in Metabolism Produced by Deep Massive Doses of the Hard Roentgen Rays, Am. J. M. Sc. 157: 453 (April) 1919.

13. Denis, W.; Aldrich, M., and Martin, C. L.: A Study of the Relative Toxic Effects Produced by Regional Radiation, Am. J. M. Sc. 160: 555 (Aug.) 1920.

14. Martin, C. L., and Rogers, F. T.: Intestinal Reaction to Erythema Dose, Am. J. Roentgenol. 10: 11 (Jan.) 1923; Roentgen Ray Cachexia, ibid. 11: 280 (March) 1924.

15. Wetzel, E.: Roentgenshädigungen mit und ohne Beteiligung der Haut, Strahlentherapie 12: 585, 1921.

16. Case, J. T., and Warthin, A. S.: The Occurrence of Hepatic Lesions in Patients Treated by Intensive Deep Roentgen Irradiation, Am. J. Roentgenol. 12: 27 (July) 1924.

PROCEDURE

Approximately 100 cases of peptic ulcer, including gastric, duodenal and jejunal lesions, were treated. In eighty-eight of these the effect on the gastric secretion was studied. The amount of radiation employed was considerably less than that used in the treatment of malignant disease and consisted of ten treatments given over a period of eleven or twelve days, five treatments

acidity and the maximum ten minute volume were considered to indicate the maximum gastric response on a given day and were the points for comparison in constructing the curves. Histamine tests were made at variable intervals during and after therapy.

RESULTS

Some depression of gastric secretion was obtained in every case treated, but the extent and duration of this depression were quite variable. The results are best portrayed by a series of charts of illustrative cases. In one case, as shown in chart 1, the gastric secretory capacity, as judged by daily histamine tests, dropped rapidly during the period of treatment from a maximum free acidity of 130 to a maximum of 20, and the maximum ten minute volume likewise dropped from 60 cc. to 26 cc. In chart 2, on the other hand, no appreciable change occurred during the period of therapy, but a marked drop did occur a few days later—from an average free acidity of 130 to approximately 30 without much change in the volume of secretion. Chart 3 similarly shows very little change during the period of treatment and only a minimum depression later. The free acidity before treatment was 115. It dropped to

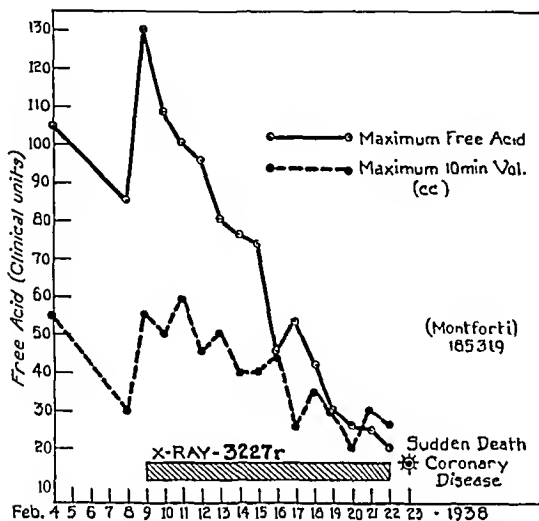


Chart 1.—Effect of radiation therapy on gastric secretion (histamine stimulation).

anteriorly and five posteriorly on alternate days through portals 15 cm. square. The portals were aimed at the upper part of the stomach. Occasionally the relationship of the portals to the stomach was checked fluoroscopically. The dose of radiation through each portal was approximately 1,500 roentgens, measured without back scatter, or a total of 3,000 roentgens. In a few instances a total dosage of 3,600 roentgens was given, and in a few others much smaller doses were used. The roentgen formula was 200 kilovolts, 25 milli-

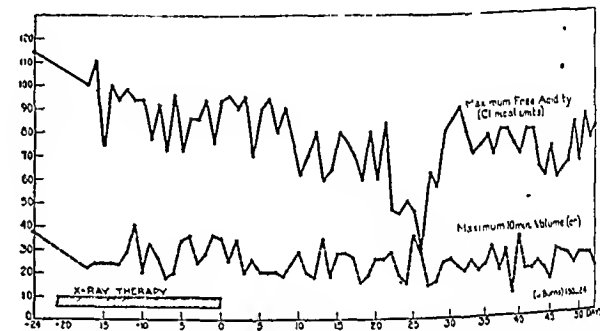


Chart 3.—Effect of radiation therapy (3,600 roentgens) on gastric secretion (histamine). Minimum depression in spite of large dose

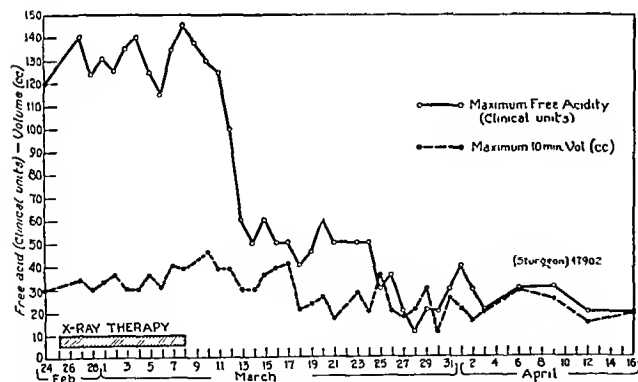


Chart 2.—Effect of radiation therapy (2,960 roentgens) on gastric secretion (histamine), showing marked reduction on daily tests.

amperes, with 1 mm. of copper plus 1 mm. of aluminum filtration, and a focal skin distance of 50 cm., from 32 to 38 roentgens being delivered per minute.

The gastric secretory response was measured by means of the standard histamine test of Bloomfield and Pollard,¹⁷ 0.01 mg. of histamine hydrochloride being used per kilogram of body weight. The maximum free

30 on one occasion, twenty-six days after treatment, but the daily level ranged around 80, with no decrease in the volume of secretion. Of the eighty-eight cases studied, the depression of secretion observed in this case was less than in any of the others.

The more chronic effects are illustrated in the subsequent charts. In chart 4 it will be seen that a complete achlorhydria to histamine appeared on the twenty-second day and persisted through the ninety-seventh day after therapy. The volume of secretion was greatly reduced. The secretory response gradually returned but at the end of a year had not regained its original level. In chart 5, on the other hand, the period of achlorhydria was of only two weeks' duration and at the end of four months gastric secretion was again normal. An additional course of therapy (1,762 roentgens) had only a temporary effect in terms of free acidity, although the depression of the volume of secretion apparently was more prolonged. Chart 6 likewise shows a temporary initial period of achlorhydria followed by a return to a high secretory response. Charts 7 and 8, by contrast, show the production of a prolonged achlorhydria lasting in each instance six months or more and with profound depression of secretion still present nine months after treatment.

In two instances, marked and prolonged depressions were noted even with small doses of radiation, as may

17. Bloomfield, A. L., and Pollard, W. S.: The Diagnostic Value of Studies of Gastric Secretion, J. A. M. A. 92: 1508 (May 4) 1929.

be seen in charts 9 and 10. In fact, as shown in chart 9, the smallest dose used in our series, 1,097 roentgens, was followed by a histamine achlorhydria of three weeks' duration and by a very low secretory response still in effect at the end of five months.

The most frequent complications encountered were those of the well known but poorly understood roentgen sickness. This usually accompanied the first two or three treatments and then disappeared. No correlation was observed between the severity of the sickness and the depression of secretion. Acute anemia was observed in one case. In this instance (chart 10) the treatment was given while the patient was recovering from a massive hemorrhage. Examination of the stools was negative for occult blood, but the blood picture had not returned to normal. After the fifth treatment the erythrocytes suddenly dropped from 3.8 to 2.86 million per cubic millimeter without evidence of hemorrhage. The treatments were therefore discontinued. No other anemia has been observed and no definite or marked anemia has appeared subsequent to therapy. In one case painless diarrhea appeared almost three months after the therapy and proved rather troublesome for two months. It then ceased and the patient has continued in good health. The only serious complication encountered in the series occurred in the patient whose

response of the gastric glands nor was it related to sex or to age, as is shown in chart 14, for the age distribution of those in whom achlorhydria developed was essentially the same as that of the entire group. It likewise did not appear to depend on height or body weight or to be a direct function of depth dose, for of the two patients in whom achlorhydria developed and persisted for approximately six months one was quite thin and the other was very obese.

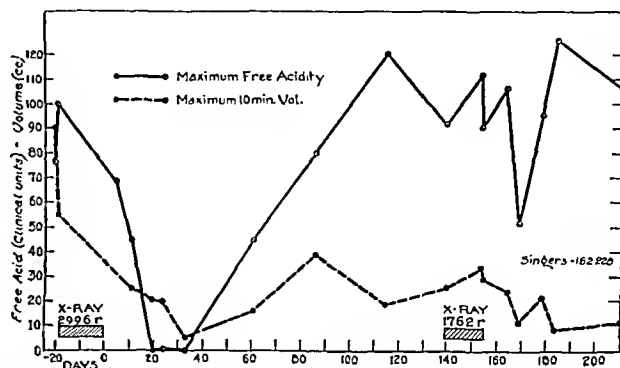


Chart 5.—Effect of radiation therapy on gastric secretion (histamine). Slight effect from second treatment.

MORPHOLOGIC CHANGES IN THE GASTRIC MUCOSA

Dawson¹⁸ in 1925 made a detailed study of the microscopic changes in the gastric mucosa of the dog following irradiation, the observations being summarized as follows:

The reduction and eventual disappearance of acid from the gastric secretion is associated with definite injury to the gastric mucosa. The most striking injury occurs in the superficial portions. Mucous, neck, chief and parietal cells are damaged. The chief cells undergo cytolysis, while the parietal are not so readily broken down. Persisting parietal cells which show no histological evidence of injury are unable to produce acid . . . the necrotic tissue is apparently sloughed, regeneration occurring from below. In regenerated mucosa the thickness is markedly reduced but the structure is histologically normal. The parietal cells show marked variations in staining

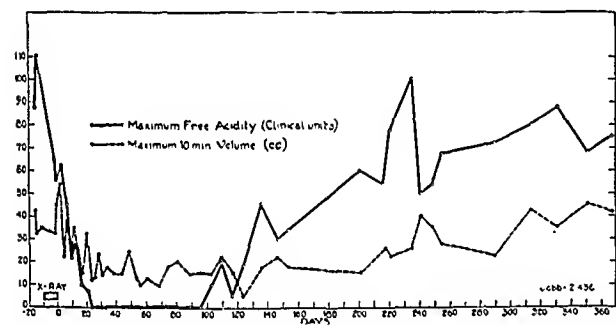


Chart 4.—Effect of radiation therapy (2,930 roentgens) on gastric secretion (histamine). Complete achlorhydria for seventy-two days; marked depression for 216 days; slight depression for 367 days.

course is shown graphically in chart 11. Three weeks after treatment acute pain and muscular rigidity appeared in the upper part of the abdomen suggesting the acute perforation of a viscus. At operation the ulcer appeared to be healed but there was a region of acute necrosis in the left lobe of the liver, presumably radiation necrosis. The overlying skin was normal. The abdominal wall was closed and the patient made an uneventful recovery. It is interesting to note in this case that, although sufficient radiation was delivered to produce local injury to the liver, the effect on gastric secretion was only moderate.

The maximum reduction in the free acidity obtained in the eighty-eight cases is summarized in chart 12, in which the maximum initial response to histamine is compared with the minimum subsequent response. It may be noted that no correlation is seen between the initial level of secretion and the amount of depression. Complete achlorhydria appeared in thirty-five of the eighty-eight cases, the known duration of achlorhydria varying from a few days to six months, as is shown in chart 13.

The susceptibility of the gastric secretory mechanism to irradiation was not related to the initial secretory

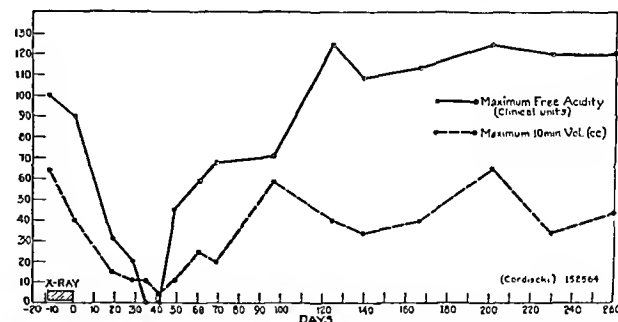


Chart 6.—Effect of radiation therapy (2,930 roentgens) on gastric secretion (histamine). Marked initial temporary depression.

and in nuclear structure. Some cells are pale with a pyknotic nucleus while others stain densely and their nuclei show a definite reticulum.

In two of the cases treated in our series, opportunity arose to study the mucosa in detail. In the first of these, described in connection with chart 1, death occurred of coronary occlusion the day after a course

18. Dawson, A. B.: Histological Changes in the Gastric Mucosa (Pawlow Pouch) of the Dog Following Irradiation, *Am. J. Roentgenol.* 13: 320 (April) 1925.

of treatment was completed totaling 3,227 roentgens in a period of thirteen days. In this case of penetrating duodenal ulcer with severe pain and with moderate diabetes mellitus, thyrotoxicosis and coronary sclerosis, death was definitely due to the rupture of an atheromatous plaque in the right coronary artery (autopsy). Extensive coronary sclerosis was present with multiple healed infarcts of the myocardium. There were no acute changes in the heart muscle and there was no

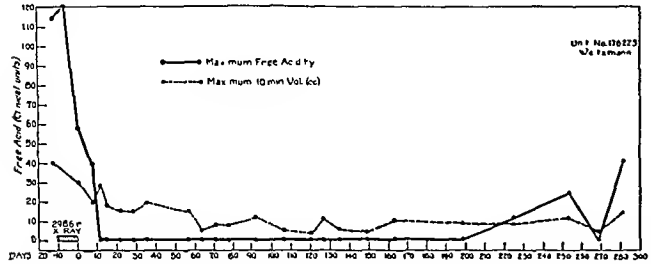


Chart 7—Effect of radiation therapy on gastric secretion (histamine stimulation). Prolonged achlorhydria.

evidence clinically or pathologically to incriminate the roentgen therapy as a precipitating factor in the death. Dr. H. G. Wells and Dr. Eleanor Humphreys of the department of pathology studied the material and Dr. Humphreys has made the following report:

The gastric mucosa is everywhere profoundly altered, especially in the fundus. While it is impossible to exclude the effects of postmortem changes, mucous cells are absent from the depths of the gastric pits as well as from the surface. The most striking changes are seen at, and just below, the base of the necks of the glands. Here the glandular pattern is distorted, and sloughing, degenerating cells are mingled with living cells. The degenerating cells stain deeply, have distorted, dark nuclei and often appear fused into ribbons or clumps. A few cytoplasmic masses without nuclei are seen. Most of the surviving cells appear abnormal. They have pale cytoplasm and vesicular nuclei, often with large nucleoli. There is an unusual variability in the size of these cells and in the size and number of their nuclei and nucleoli. Some are huge, syncytial masses with from five to ten nuclei. Mitotic figures are few and are seen only in cells of normal size. Deeper in the glands there are minor degenerative changes (nuclear pyknosis, cytoplasmic vacuolization and the like) in both chief and parietal cells. Acute and chronic inflammatory changes are present—inter-

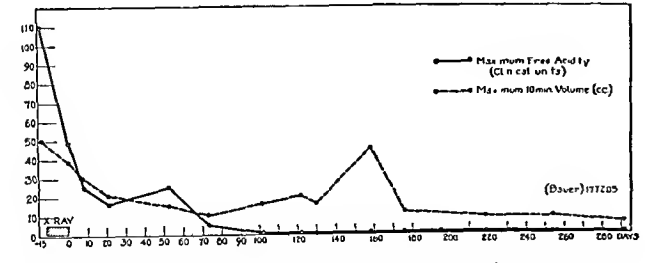


Chart 8.—Effect of radiation therapy (2,937 roentgens) on gastric secretion (histamine). Prolonged achlorhydria.

stitial foci of lymphocytes and plasma cells, in some cases with a few eosinophils and neutrophils—and accumulations of neutrophils within the lumens of some of the glands.

Comment.—It is interesting that this mixture of degenerative hyperplastic reaction is seen in the region which is the normal site of greatest cellular growth—at, and near, the necks of the glands. It is also interesting that the changes at the lower end of the esophagus, bordering the cardia (absent at a higher level), are qualitatively similar with an intermixture of cell degeneration and hyperplasia in the germinal basal layer, and with entirely similar large and multinucleate cells in the layers

above. From other studies that I have made I think that the cell hypertrophy, giant-cell formation and the like of the type seen in these two regions represent an abnormal hyperplastic response to injury—a probably unsuccessful response. Transition forms seem to me to indicate that the injured cell increases in size, its nucleus enlarges and divides (amitotically), but no division of cells follows. The end stage is a huge cell—with multiple nuclei of varying sizes—which presumably degenerates.

The second patient received 2,937 roentgens from June 28 to July 9, 1937, and died Jan. 29, 1938, of malignant nephrosclerosis. The maximum free acidity (histamine) before treatment was 102. Complete achlorhydria (histamine) was present Aug. 23 and 30, Sept. 7, Oct. 2 and 30, Nov. 24 and Dec. 28, 1937. The histologic study made by Drs. Wells and Humphreys and reported by Dr. Humphreys follows:

Multiple sections show that there is a widespread, chronic gastritis, with focal thinning of the mucous membrane and both atrophy and focal hyperplasia of gastric glands. There is a general increase of fibrous tissue in the mucosa with a broad zone between the muscularis mucosae and, especially in the most thinned regions, increased amounts between the glands. This is heavily infiltrated with leukocytes—most of them plasma cells—but with a few neutrophils and occasional eosinophils. Even in the best preserved region—in the fundus near the greater curvature—glands are atrophic; many are lined by

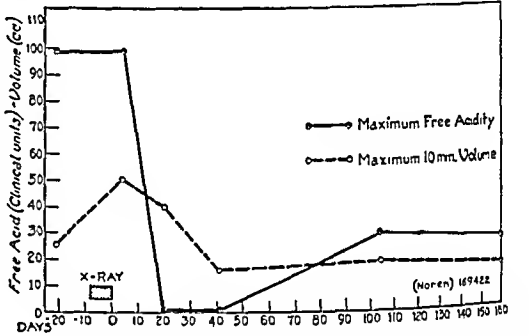


Chart 9.—Effect of radiation therapy (1,097 roentgens) on gastric secretion (histamine). Prolonged depression with rather small dose.

small, indeterminate cells and relatively large normal-appearing oxyphils. Chief cells are few. In several sections from greatly thinned regions—on or near the lesser curvature—the glands are very small, distorted and far apart and, structurally, look like atrophic tubules from the pyloric region. Fewer in number but scattered throughout the atrophic tubules are others which are much larger, lined by closely crowded, tall cells with dark basal nuclei. These look much more like intestinal crypts than gastric glands. The mucosa of the pylorus is not atrophic, its glands are hyperplastic and there is one focus of glands of the intestinal type which structurally resemble the glands of an adenoma. Mitotic figures are relatively numerous in most of the glands of the intestinal type. Changes in the surface epithelium could not be made out because of postmortem changes.

Comment.—I can find no changes here which could with certainty be attributed to irradiation or, conversely, which could not be accounted for by chronic, atrophic gastritis. It is the absence of significant chronic changes in the other case which makes it possible, with reasonable certainty, to attribute the alterations to the recent injury by x-rays.

In both cases the autopsies were unavoidably delayed, and the consequent postmortem changes interfered to a certain extent with the appraisal of the cellular alterations.

A third patient received 2,074 roentgens between Oct. 4 and 12, 1937. November 17 a posterior gastroenterostomy was undone. A piece of mucosa was

removed from the anterior wall of the fundus of the stomach for microscopic examination. Dr. Humphreys was unable to make out anything unusual. "There may be very slight mucosal atrophy (some of the glands seem small). The acid-secreting cells are certainly numerous. There are no significant inflammatory changes." A histamine test the day before the operation disclosed a maximum free acidity of 48 in the presence of a functioning gastro-enterostomy.

The gross appearance of the gastric mucosa in many of the patients in this series was studied gastroscopically from time to time by Dr. Rudolf Schindler, to whom we are greatly indebted. These observations will be reported in greater detail in a later communication. It may be noted at this time that the alterations were not entirely constant or consistent. Superficial gastritis of varying severity was frequently found. Definite necrosis of the mucosa was never observed. Hypertrophic gastritis frequently disappeared. In many instances the mucosa appeared normal even during the period of achlorhydria to histamine. The following gastroscopic protocols of the patient mentioned in connection with chart 8, who continues to have a histamine achlorhydria 322 days after the last radiation treatment, are illustrative. The patient received 2,937 roentgens between June 26 and July 8, 1937.

June 30, 1937: Circumscribed hypertrophic gastritis of the posterior wall of the stomach.

October 15: In the antrum and in the lower portions of the body, small amounts of adherent mucus were observed. The upper portions were entirely normal. Impression: Slight superficial gastritis.

December 3: The entire stomach was seen. The pylorus was found and open and did not contract during the examination. There was one mucosal hemorrhage, pinhead sized, in the greater curvature of the antrum, lying in normal mucous membrane. The mucosa of the lesser curvature and of the anterior wall of the body was covered by patches of gray, dirty, adherent mucus. In the lesser curvature a very small, shallow, elliptic, yellowish gray ulceration, sharply defined, was seen. Impression: (1) very small ulcer in the lesser curvature, (2) one mucosal hemorrhage in normal mucosa, (3) extensive superficial chronic gastritis of the body.

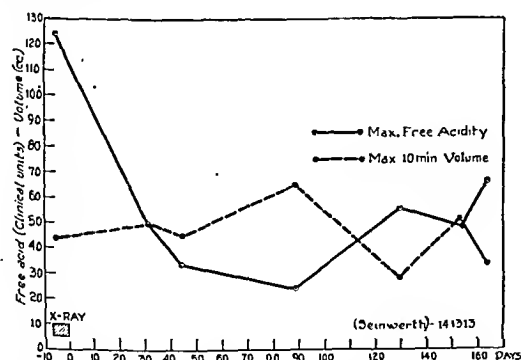


Chart 10.—Effect of radiation therapy (1,472 roentgens) on gastric secretion (histamine). Marked reduction with small dose.

Jan. 5, 1938: No ulcer was seen. The gastric mucosa of the antrum and the body was a little bit mottled and contained some patches of adherent mucus. Impression: (1) no ulcer visible, (2) very slight superficial gastritis.

April 1: The stomach was well seen. The mucosa looked normal today. Impression: Normal mucosa.

May 16: The entire mucosa of the antrum as well as of the body presented layers of adherent mucus which did not contain air bubbles: Impression: Extensive superficial gastritis of the entire stomach.

It may be added incidentally that the patient has been without symptoms and perfectly well clinically since his admission to the hospital June 5, 1937.

The status of the ulcer in each case was studied carefully but the observations are not included in this report because the patients were given the standard Sippy acid neutralization management in addition to the radiation therapy and also because insufficient time has elapsed for valid appraisal of the method. Various workers¹⁹

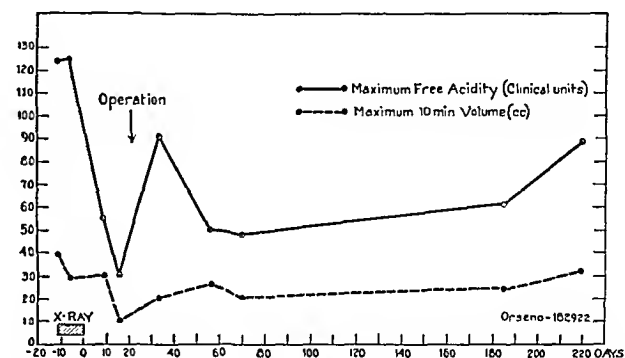


Chart 11.—Effect of radiation therapy (2,965 roentgens) on gastric secretion (histamine stimulation). Moderate reduction only in spite of injury to liver.

have used roentgen rays in the treatment of ulcer since the initial report by Wilms²⁰ in 1916. The results have been debatable, particularly if one recalls the demonstration by Sandweiss²¹ that remissions in the symptomatology of peptic ulcer can be induced psychotherapeutically by the intravenous injection of distilled water. The largest series of cases described is that of Matoni,²² who treated 140 patients with complete healing of the ulcer in 77.1 per cent, improvement in 13.6 per cent and no improvement in 9.3 per cent. The question arises as to whether the improvement resulted from the therapy or was independent of it. Great care must

19. These include:

- Bryan, Lloyd, and Dormody, Hugh: Preliminary Report on the Effects of Roentgen Rays on Gastric Hyperacidity, *Am. J. Roentgenol.* 5: 623 (Nov.) 1921.
- Lenk, Robert: Röntgenbehandlung bei schlecht funktionierenden Gastro-Enteranastomosen (Vorläufige Mitteilung), *Wien. klin. Wchnschr.* 34: 451 (Sept. 15) 1921.
- Schulze-Berge, A.: Ueber Heilung von Magengeschwüren und verwandten Erkrankungen durch Röntgentiefenbestrahlung, *Strahlentherapie* 14: 650, 1923.
- Lenk, Robert; Holzknecht, Guido, and Sielmann, H.: Konservative Aetiologische Ulkustherapie, *Wien. Arch. f. inn. Med.* 6: 137, 1923.
- Lenk, Robert, and Holzknecht, Guido: Roentgen Ray Therapy of Gastric and Duodenal Ulcers and Other Benign Affections of the Gastrointestinal Tract, *Radiology* 6: 37 (Jan.) 1926.
- Nauenberg, Walter: Die Röntgentherapie des Ulcus ventriculi et duodeni, *Arch. f. Verdauungskr.* 38: 20, 1926.
- Schiller, Victor, and Altschul, Walter: "Die Röntgenbehandlung des Ulcuskrankheit, *Strahlentherapie* 24: 736, 1927.
- Lenk, Robert: Die Erfolge bei der Röntgentherapie des Ulcus ventriculi et duodeni, *Wien. klin. Wchnschr.* 40: 1454 (Nov. 17) 1927.
- Gatch, W. D.; Smith, L. A., and Moser, R. H.: The Control of Jejunal Ulcer by Deep Roentgen Therapy, with Case Report, presented at the thirty-seventh annual meeting of the Western Surgical Association, Omaha, Dec. 8, 1927.
- Woenckhaus, E.: Ueber die Strahlenbehandlung des Ulcus duodeni und der Hyperacidität, *Fortsch. a. d. Geb. der Röntgenstrahlen* 37: 880 (June) 1928.
- Solomon: Traitement de l'hyperchlorhydrie et de l'ulcère de l'estomac par les rayons de roentgen, *Paris méd.* 1: 123 (Feb. 4) 1928.
- Groszlik, Adam: Zur Röntgenbehandlung des Magen-Duodenalgeschwürs, *Strahlentherapie* 40: 286, 1931.
- Woenckhaus, E.; Katscher, M. L., and Aviossor, M. L.: Die Röntgenbehandlung des Magen- und Duodenalgeschwürs, *Röntgen* 1936.
- Holst, Leopold; Sebaal, G., and Negovskij, N.: Die Röntgentherapie des Ulcus ventriculi et duodeni, *Fortsch. a. d. Geb. d. Röntgenstrahlen* 50: 360 (Oct.) 1934.
20. Wilms: Röntgenbestrahlung bei Pylorospasmus, *München. med. Wchnschr.* 63: 1073, 1916.
21. Sandweiss, D. J.: Comparative Results with Dietetic, Parenteral and Surgical Treatment in Peptic Ulcer, *J. A. M. A.* 108: 700 (Feb. 27) 1937.
22. Matoni, H. H.: Die Röntgenbestrahlung von Magen- und Duodenalgeschwüren und deren Erfolge, *Med. Klin.* 19: 1220 (Sept. 9) 1923.

be exercised in the evaluation of therapeutic "results" in the treatment of peptic ulcer. Our study of this group of patients is being continued in the hope that in time we may be able to evaluate more satisfactorily the role of radiation therapy in the management of

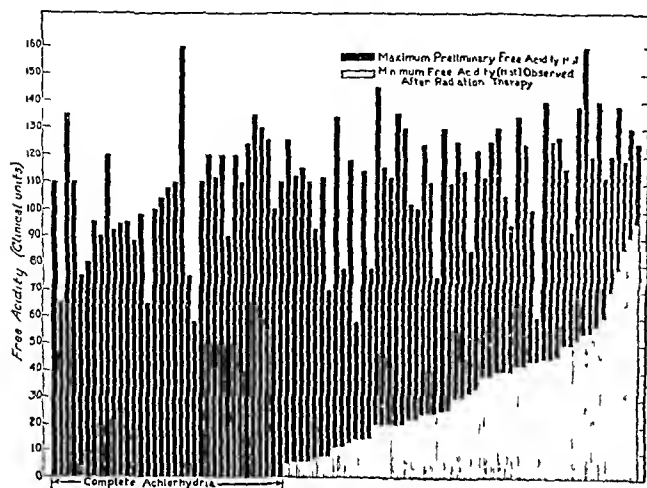


Chart 12.—Maximum reduction in free acidity (histamine) following radiation therapy; Summary of eighty-eight cases.

ulcer. It is perhaps significant that during the phase of achlorhydria relief of symptoms invariably occurred, accompanied in many cases by objective (roentgenologic or gastroscopic) evidence of progressive healing of the ulcer. In no instance did the symptoms recur or the ulcer increase in size during the period of achlorhydria. The final effect of irradiation, not only on the gastric

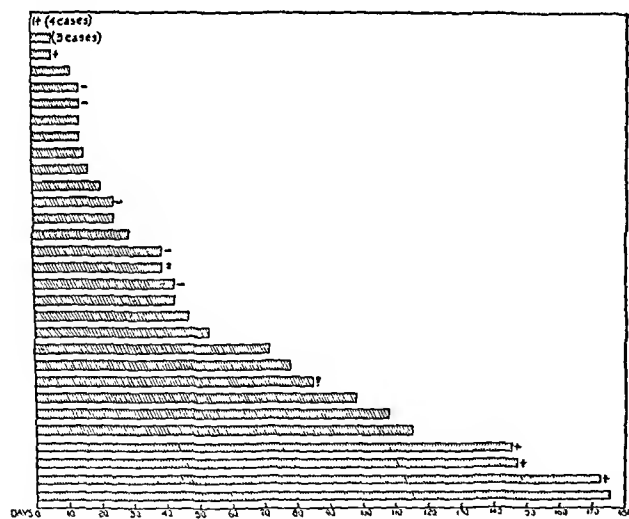


Chart 13.—Known duration of achlorhydria (histamine): thirty five cases.

secretion and the course of the ulcer but also on the normal tissue within the field of radiation, remains still to be determined.

SUMMARY AND CONCLUSIONS

1. Radiation therapy directed toward the upper two thirds of the stomach and applied in the manner that has been described in doses totaling from 1,100 to 3,600 roentgens definitely depresses gastric secretion in man.

2. The extent and duration of this depression are extremely variable and as yet unpredictable.

3. Development of a complete achlorhydria to histamine was demonstrated in thirty-five of the eighty-eight cases studied. The duration of the achlorhydria was shown to vary from a few days to more than nine months.

4. Susceptibility to irradiation does not depend on age, sex, body weight or initial glandular activity.

5. Morphologic evidence of cellular injury in the mucosa following irradiation consists in the demonstration (a) gastroscopically, of superficial gastritis variable in severity and inconstantly present, and (b) histologically, of alterations in cellular structure similar to those described by Dawson in the dog.

6. The potential dangers of radiation therapy used as described and in total doses of 3,000 roentgens or greater are those arising from injury to other organs, notably the intestine and the liver. Localized liver necrosis occurred in one case; in another a rather troublesome diarrhea appeared, presumably due to intestinal injury, and in a third a sudden but not serious drop in the red cell count was noted. No evidence of renal or pancreatic damage was observed in this series.

ADDENDUM

In the interval between completion of the paper and receipt of the proof, free acidity returned finally in the case illustrated in chart 8, in which the period of

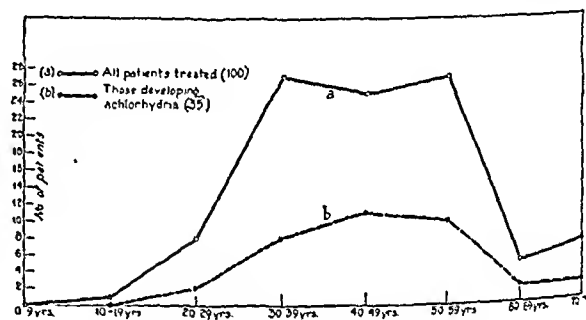


Chart 14.—Age distribution (decades).

achlorhydria was the longest that occurred in our series. The maximum free acidity (histamine) was 8 on the 405th day after therapy, 13, 15, 11 and 8 on the 444th, 472d, 499th and 530th days respectively. Repeated gastroscopic examinations have disclosed no evidence of recurrent ulcer but have revealed a persistent superficial gastritis. The patient, however, has continued in excellent clinical health without distress or symptoms of any kind since the institution of treatment twenty months ago.

Reference should also be made to the fact that, while the results of the combined radiation and Sippy management in the group mentioned have been satisfactory to us on the whole, there have been at least two notable exceptions—one gastric ulcer which did not heal and one recurrent gastric ulcer (cases 6 and 11 reported by Palmer, Schindler and Templeton). Achlorhydria was not produced by the radiation in either case.

An additional series of cases has been studied with a total radiation dosage of only 1,200 roentgens (three treatments of 200 roentgens each anteriorly and posteriorly), but the depression of secretion has been much less marked. A third series is now being undertaken with five treatments anteriorly and five posteriorly of 225 roentgens each, a total dosage of 2,250 roentgens, the formula being the same as in the initial series.

SULFAPYRIDINE IN THE TREATMENT
OF PNEUMONIA IN INFANCY
AND CHILDHOOD

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The results of the use of 2-(para-aminobenzenesulfonamido) pyridine, officially known as sulfapyridine, in animal experiments and the favorable effects obtained with it in the treatment of pneumonic infections in human beings warrant a trial of this drug with infants and children under carefully controlled conditions. Furthermore, whenever possible the results of such a study should be subjected to statistical analysis. For this purpose we have employed the methods of Fisher¹ because they appeared to be the most appropriate for the analysis of a small series.² Both the value and the possible harmful effects of sulfapyridine must be determined as soon as possible so that physicians may know how widely it should be used. No attempt will be made to review the literature on this subject, since adequate reviews are available.³

In a study of any treatment of pneumonia in children the low case fatality rate makes it essential that conclusions be based on other considerations, such as the course and duration of the disease and the incidence of complications. Furthermore, since the severity, type and complications of pneumonia may vary from one year to another, it is important that the group treated with sulfapyridine and a control group be studied simultaneously.

PLAN OF THE STUDY

When a diagnosis of pneumonia was made or suspected on a patient's admission to the hospital, he was allocated to one of two groups designated respectively "control" and "sulfapyridine" in such a way as to have the two groups, when the study was completed, as comparable as possible as to age, the duration of the pneumonia and its severity at the time of admission. All patients except those suffering from empyema on admission were included in one or the other of the groups.

Experience with other forms of treatment of pneumonia indicates that the results are in general related to the day of the disease on which treatment is instituted. It was decided therefore not to delay medication until bacteriologic or roentgenologic confirmation was obtained. In the sulfapyridine group the administration of the drug was begun as soon as blood, and material from the throat, had been secured for culture.

A number of children who received sulfapyridine but who later were found not to be suffering from pneumonia were excluded from the study.

Early in the study patients who were treated with sulfapyridine were administered aliquot doses every three hours, every four hours or, in a few instances, every six hours in such an amount that 1 grain (0.06 Gm.) per pound of body weight was received each twenty-four hours, a large initial dose of one-half the amount calculated for the twenty-four hours being administered on admission in order to obtain quickly a therapeutic level in the blood. In accordance with the procedure which is usually adopted with sulfanilamide medication, sodium bicarbonate was administered in doses equal to those of sulfapyridine. In most instances medication was continued until the patient had been afebrile for about five days. Later in the study 1½ grains (0.1 Gm.) of sulfapyridine was administered per pound of body weight each twenty-four hours in order that the effects of higher levels in the blood might be observed. With two patients who were not responding well it was found that the level of sulfapyridine in the blood was less than 2 mg. per hundred cubic centimeters, and larger doses were then administered until the level rose. The drug was powdered and suspended in a half ounce or so of water for oral administration, and, since sulfapyridine is a relatively insoluble compound, fluids were administered liberally after each dose to promote its absorption.

At the beginning of the study determinations of the levels of free sulfapyridine in the blood were made on oxytated venous blood, the method of Marshall and Litchfield⁴ with sulfanilamide being employed as a standard and a correction factor for sulfapyridine being determined. Later a photoelectric colorimeter (Evelyn) was used so that determinations could be made on 0.1 cc. of capillary blood from finger or ear, thus making possible daily determinations in the case of even the smallest patients.⁵ So far as practicable, transfusions, oxygen therapy and other nonspecific measures were used for the same indications in the two groups.

Since sputum is not available or is difficult to obtain from children, material for culture was secured by swabs introduced deep into the oropharynx, with the patient's head hyperextended and his tongue sharply depressed, the swab being held in the throat until coughing was elicited. Duplicate specimens were obtained in this manner on admission of the patient to the hospital. One of these was planted in neopeptone-dextrose broth, and the other was streaked onto a blood agar plate. After incubation of from twelve to twenty-four hours the broth cultures were typed for pneumococci by the Neufeld method and the blood agar plates were examined for predominating organisms. When a broth culture yielded no pneumococci, two mice were inoculated intraperitoneally and the peritoneal exudate was subsequently examined. Even when broth cultures yielded pneumococci, mice were employed at times in the attempt to find additional types which might have been missed on direct examination of the broth cultures. Duplicate specimens from the throat were obtained again within twenty-four to forty-eight hours after admission and subjected to the procedures described.

Merck & Co., furnished the sulfapyridine (dagenan) used.
From the Children's Hospital Research Foundation, the Children's Hospital, the Pediatric Service of the Cincinnati General Hospital, and the Department of Pediatrics, University of Cincinnati College of Medicine.
1. (a) Fisher, R. A.: Design of Experiments, Edinburgh, Oliver & Boyd, 1937; (b) Statistical Methods for Research Workers, ed. 6, Edinburgh, Oliver & Boyd, 1936.

2. Advice regarding the statistical methods employed and the actual calculations from the data were furnished by Estelle W. Brown, statistician of the Children's Hospital Research Foundation.

3. Long, P. H.: Sulfapyridine, *J. A. M. A.* **112**: 538 (Feb. 11) 1939. Sulfapyridine, the New Sulfanilamide Derivative, editorial, *ibid.* **112**: 540 (Feb. 11) 1939. Barnett, H. L.; Hartmann, A. F.; Perley, A. M., and Ruhoff, M. B.: Treatment of Pneumococcal Infections in Infants and Children with Sulfapyridine, *ibid.* **112**: 518 (Feb. 11) 1939.

4. Marshall, E. K., Jr., and Litchfield, J. T., Jr.: Determination of Sulfanilamide, *Science* **88**: 85 (July 22) 1938.

5. For determinations with the photoelectric colorimeter the method of Marshall and Litchfield was modified by diluting 0.1 cc. of blood to 10 cc. with the saponin and acid solutions. The final concentration of trichloroacetic acid remained at 3 per cent (personal communication from Dr. Marshall).

Blood for culture was obtained from all patients on admission to the hospital, from 3 to 5 cc. being placed in tubes of neopeptone-dextrose broth and from 3 to 5 cc. in flasks of dried citrate so that colony counts on poured agar plates could be made.

When a myringotomy was performed the contaminated myringotomy knife was used for inoculation into

a tube of the broth. In addition the material obtained from a swab was inoculated into broth and streaked on blood agar plates. When the patient's ears were draining on admission to the hospital the discharge was cultured in a similar manner. When bilateral suppurative otitis media was present the discharge from each ear was separately cultured.



The chart of a white boy aged 2 years from the sulfapyridine group. The onset was sudden, although there had been an infection of the upper respiratory tract for the previous ten days.

Date.....	1/24/39	1/25/39	1/26/39	1/27/39	1/28/39	1/29/39	1/30/39
Hospital days.....	0	1	2	3	4	5	6
Days of pneumonia.....	3	4	5	6	7	8	9
Treatment.....	Sulfapyridine 32 grains sponge	Sulfapyridine 48 grains	Sulfapyridine 48 grains	Sulfapyridine 48 grains	Sulfapyridine 48 grains	Sulfapyridine 48 grains	Sulfapyridine 30 grains
Red blood count....	4.73	....	....	....	....	....	5.01
Hemoglobin.....	9.7	....	....	....	....	....	10.0
Cell hemoglobin....	20.5	....	....	....	....	....	20.0
White blood count..	21.4	....	....	....	....	....	5.7
Drug.....	....	7.7	4.7	4.0	5.0	....	5.8
Polymorphonuclears	75	..	....	....	....	....	39
Lymphocytes.....	13	..	..	....	....	....	46
Mononuclears.....	12	..	..	....	....	....	8
Basophils.....	0	..	..	....	....	....	1
Eosinophils.....	0	..	..	....	....	....	6
Throat culture.....	Pn. XIV and XXI	Po. XIV	....	....	....	....	....
Blood culture.....	Negative	....	....	....	....	....	....
Other culture.....	Left ear: hemophilic staphylococcus	....	....	....	....	....	....
X-ray.....	Consolidation in right lower lobe	....	Clearer	....	Still slight increase in den- sity, R.L.L.	....	....
Condition.....	Severe	Fair to good	Good	Good	Good	Good	Good
Cyanosis.....	Slight	None	None	None	None	None	None
Dyspnea.....	Slight	None	None	None	None	None	None
Complications.....	Left ear draining	Left ear draining	Left ear moist	Left ear draining	Left ear draining	Left ear draining	Left ear draining
Distention.....	None	None	None	None	None	None	None
Drug reaction.....	None	None	None	None	None	None	None
Chest findings.....	P.N. dull, R.L.L.; B.S. tubular near spine, R.L.L.; no bron- chophony; a few inspiratory râles fine, R.L.L.; B.S. distant, right postaxillary line and extreme right base posteriorly	P.N. dull, R.L.L.; B.S. distant but not definitely tubular, R.L.L.; V.F. not ob- tained; no râles; left side of chest clear; patient much improved	P.N. dull, R.L.L.; B.S. high pitched and suppressed R.L.L.; a few fine inspiratory râles, R.L.L.; V.F. not ob- tained; is ap- parently recov- ered, sitting up in bed	P.N. impaired, R.L.L.; B.S. somewhat sup- pressed, R.L.L.; V.F. not altered but T.F. slightly increased, R.L.L.; no râles	P.N. impaired, R.L.L.; B.S. slightly sup- pressed, R.L.L.; a few fine inspira- tory râles at angle of right scapula, small area; V.F. not altered	P.N. impaired, R.L.L.; B.S. slightly sup- pressed, R.L.L.; V.F. not altered; no râles	P.N. slightly if any impaired, R.L.L.; B.S. slightly distant, slightly distant, R.L.L.; V.F. not altered; no râles

Wt. 45.0

Note: P.N. = percussion note; B.S. = breath sounds; T.F. = tactile fremitus; V.F. = vocal fremitus.

Fluids obtained by thoracentesis were cultured and the organisms identified in the usual manner.

Special arrangements were made by which all material for cultural studies and for chemical analyses were sent to the laboratories without delay.

At the Children's Hospital roentgenograms were made at intervals of two or three days from the time of admission until there was complete resolution of the exudate; at the Cincinnati General Hospital they were made less frequently.

The diagnosis of pneumonia was made by physical examination and observation of the clinical course; roentgenograms confirmed the diagnosis in all but three cases, but in these the clinical diagnosis was sufficiently certain to justify their inclusion in the study. It appeared proper to analyze croupous pneumonia and bronchopneumonia together, without reporting them in two groups. The differentiation between these two types of pneumonia even with the assistance of roentgenograms is not easy, and, furthermore, the course

group were patients in the Children's Hospital and thirteen in each group patients at the Cincinnati General Hospital.

Table 1 demonstrates the similarity of the control group and the sulfapyridine group with respect to the age of the patient, the severity of the pneumonia, the estimated duration of the pneumonia when the patient was admitted to the hospital, and the type of pneumonia. This satisfactory similarity was achieved in a series of this small size by the deliberate distribution of the patients as previously described.

TABLE 2—Types of Pneumococci Isolated from Throats*

Type of Pneumococcus	Control Group	Sulfapyridine Group	Type of Pneumococcus	Control Group	Sulfapyridine Group
I	6	6	XVI	3	1
II	1	0	XVII	1	0
III	1	1	XVIII	3	1
IV	1	2	XIX	3	7
V	2	0	XX	0	2
VI	6	6	XXI	1	1
VII	2	2	XXII	2	1
IX	0	1	XXIII	2	3
X	0	2	XXIV	0	1
XI	0	1	XXV	0	2
XIII	2	0	XXVI	0	1
XIV	4	5	None	3	6
XV	1	0			

* This includes all pneumococci observed, whether alone or in combination with other types.

Tables 2 and 3 show the types of pneumococci observed in the cultures of material from the pharynx. The number of cases is too few to warrant analysis of the type of pneumococci in relation to severity or type of pneumonia or effect of therapy.

Of the seventy patients only one, who happened to belong in the sulfapyridine group and who later had empyema, had bacteremia, this being due to type VI pneumococci. This patient subsequently recovered.

In a later and more complete report there will be presented the results of the cultures of material from the ears and pleura.

Two patients who died within twenty-four hours of admission to the hospital were not included in this study. One was moribund on admission and received

TABLE 3.—Types of Pneumococci in Cases in Which More Than One Type Was Identified

Control Group	Sulfapyridine Group
III, XVIII	I, XXIII
IV, XVI	I, VI
V, VI, XXII	I, XIV, XIX, XX
VI, XIII, XVI, XVIII	I, XI, XVIII
VI, XIX	I, XX, XXXI
XIII, XVI	III, VI
XXI, XXIII	IV, XIX
XXIII, XXV	VII, XIV, XVI
	X, XXIX
	XIV, XXI

his initial dose of sulfapyridine but died within four hours. The seventy patients included in the study all recovered from their pneumonia.

ANALYSIS OF THE RESULTS

1. *The Course of the Pneumonia.*—The course of the pneumonia in sixty-six cases could be observed closely from admission to the hospital until recovery in a manner satisfactory for statistical analysis. Symbols were placed on the charts marking the first day on which there was a significant fall in temperature. The first day of clinical improvement which was subse-

TABLE 1—Analysis of Seventy Cases of Pneumonia

	Control Group (Total, 37)	Sulfapyridine Group (Total, 33)
Age		
0-11 months	9	8
12-24 months	9	8
2-4 years	10	11
5 years and over	7	5
Severity		
Mild	4	1
Moderate	16	16
Severe	11	17
Very severe	2	2
Estimated duration of pneumonia on admission		
1 day	3	1
2 days	14	12
3 days	9	11
4 days	5	7
5 days	4	2
6 days	2	1
7 days and over	0	1
Average	2.9	3.1
Type of pneumonia		
Croupous pneumonia	22	20
Bronchopneumonia	11	13
Unclassified	2	2

of the pneumonic symptoms, an important differential point, was so influenced by sulfapyridine therapy that it was no longer helpful. The diagnoses as made by us are, however, listed in table 1.

To facilitate the keeping of records and the final analysis of the cases, a special graphic chart was evolved on which to record the material contained in the accompanying table and chart, i. e. the temperature, pulse rate, respiratory rate, treatment and results of clinical and laboratory observation. The data were recorded and physical examinations performed, to insure uniformity, by two members of the group making the study, one observing closely the patients in the Children's Hospital and the other those in the Cincinnati General Hospital. Frequent conferences were held to correlate the observations. The bacteriologic examinations and the determinations of the sulfapyridine levels of the blood were all made in the Children's Hospital by the same group of workers. It may be stated therefore that the patients in the two hospitals were observed under sufficiently similar conditions to warrant their combination in the study.

ANALYSIS OF THE MATERIAL

The course of pneumonia was observed and analyzed in seventy of our patients, thirty-five of whom received sulfapyridine. It happened that twenty-two in each

quently maintained, and the first day on which recovery could be considered from a clinical standpoint to have occurred, as demonstrated in the accompanying chart. There were thirty-three patients in the control group and thirty-three in the sulfapyridine group. The remaining four patients of the original seventy were not included in this particular part of the study because three of them acquired parapneumonic empyema, so that the termination of their pneumonia could not be accurately ascertained, and in the fourth an adequate concentration of sulfapyridine could not be maintained in the blood and the course of his disease was not therefore considered to be that of pneumonia affected by sulfapyridine.

In the control group, as demonstrated in table 4, the patients, on an average, manifested their first maintained clinical improvement late in the seventh day from the onset of their pneumonia, their temperature fell significantly early in the ninth day and they could be considered as having recovered early in the twelfth day. In the sulfapyridine group, on an average, the patients manifested their first maintained clinical improvement late in the fourth day from the onset of the pneumonia, their temperature fell significantly late in the fifth day, and they could be considered as having recovered by the middle of the eighth day. Thus, as estimated from the temperature curves and the clinical impressions of the time at which improvement and recovery occurred, patients not receiving sulfapyridine had, on an average, three or four more days of illness than patients treated with sulfapyridine.

When the data are analyzed from the point of view of the duration of the pneumonia after the beginning of hospital treatment, the patients in the control group, on an average, manifested their first maintained clinical improvement early in the fifth day, their temperatures fell significantly early in the sixth day and they could be considered as having recovered late in the ninth day.

TABLE 4.—Clinical Results in Sixty-Six Cases of Pneumonia*

	Control Group, 33	Sulfapyridine Group, 33	Difference in Days	p†
Mean day of pneumonia at				
Clinical improvement.....	7.0	4.0	3.0	<0.01
Significant fall in temperature.....	8.1	4.7	3.4	<0.01
Clinical recovery.....	11.2	7.5	3.7	<0.01
Mean day of treatment at				
Clinical improvement.....	4.4	1.9	2.5	<0.01
Significant fall in temperature.....	5.3	1.9	3.4	<0.01
Clinical recovery.....	8.9	4.7	4.2	<0.01

* The data in this table were analyzed by the comparison of two means (Fisher,¹⁰ section 24.1, p. 128).

† p = percentage chance that a deviation as great as or greater than that observed would arise by chance alone, any value of p less than 0.05 being significant.

In the sulfapyridine group, on an average, the patients manifested their first maintained clinical improvement and their first significant fall in temperature late in the second hospital day and could be considered as having recovered late in the fifth day. Thus, while under observation in the hospital, patients not receiving sulfapyridine had, on an average, three and one-half more days of fever and four more days of illness than patients treated with sulfapyridine.

As seen from the values of "p" in the last column of table 4, there is a real significance in the difference between the duration of the disease in the sulfapyridine group and in the control group.

2. *The Incidence of Complications.*—The occurrence of suppurative complications in the two groups of patients is analyzed in table 5. Although complications considered as a whole were less frequent in the sulfapyridine group than in the control group, statistical analysis does not prove that this difference is significant ("p" is between 0.3 and 0.2). However, the difference in the occurrence of suppurative otitis media in the two groups suggests that for this complication the difference might be a real one ("p" is just over 0.05).

3. *Failures and Relapses.*—Two patients receiving sulfapyridine pursued the characteristic course of pneumonia without apparent effect from the drug, although adequate levels were maintained in the blood. The

TABLE 5.—Complications Which Developed in the Hospital in Seventy Cases of Pneumonia

	Control Group	Sulfapyridine Group
Catarrhal otitis media.....	3	5
Suppurative otitis media.....	12	5
Acute mastoiditis.....	2	0
Empyema.....	3	1

$\chi^2 = 4.1139$ — $n = 3$ — p is between 0.3 and 0.2.

treatment of the third patient must be considered as a failure, since the course of his disease was apparently not shortened. In his case it was impossible to secure continuously a level of the drug in the blood above 2 mg. per hundred cubic centimeters, but it is worth while noting that when the level was high his temperature fell and temporary improvement occurred and that when the level was low his fever recurred and he appeared more acutely ill. This sequence of events was repeated three times before the pneumonia terminated in recovery.

Three of the patients in the sulfapyridine group and one in the control group had relapses. The three patients treated with sulfapyridine had manifested satisfactory initial responses to the drug. One had four relapses but responded fairly well to each renewed administration of sulfapyridine.

4. *The Duration of Abnormal Roentgenographic Densities.*—When the time at which roentgenographic evidence of pneumonia disappeared in twelve patients in the sulfapyridine group was compared with the time at which it disappeared in eight patients in the control group, no statistically significant difference was found ("p" = 0.5).

5. *Concentration of Sulfapyridine in the Blood.*—Since we were not employing the micromethod at the beginning of the study, there is available for the thirty-five patients who received sulfapyridine a total of only 121 determinations of the level of the drug in the blood. The average level was 4.7 mg. per hundred cubic centimeters, the highest 23.4 mg. and the lowest a trace. When the levels of the several determinations per patient were averaged the range was from 1.7 to 15.0 mg. per hundred cubic centimeters.

In several cases the levels of sulfapyridine in the blood were obtained at intervals of two hours. Although the levels in these cases were different, in each one a level obtained within three hours after the large initial dose of sulfapyridine was administered was maintained rather constantly for twenty-four hours.

Eliminating two patients—one whose highest blood level was 23.4 mg. and whose average level was 15 mg.

per hundred cubic centimeters and another who showed only a trace of the drug on one determination and whose blood levels could not be averaged—the average level in the blood of twenty-five patients receiving 1 grain of sulfapyridine per pound of body weight each twenty-four hours was 3.8 mg. per hundred cubic centimeters; for eight patients receiving $1\frac{1}{2}$ grains per pound it was 4.6 mg. The average levels for these patients according to age were as follows: under 11 months, 4.1 mg.; from 12 to 23 months, 4.1 mg.; from 2 to 4 years, 3.6 mg., and 5 years and over, 4.4 mg.

Twenty children who made a favorable response to the drug within twenty-four hours of the beginning of its administration had at the time of response a mean level of sulfapyridine in the blood of 4.51 ± 0.31 mg. per hundred cubic centimeters (standard deviation of 1.40 ± 0.22 mg. per hundred cubic centimeters). Children manifesting a delayed response, no response or relapse had approximately the same average levels.

The optimum dosage of sulfapyridine needs further study. The figures reported here suggest that a dosage which secures a level of the drug in the blood of approximately 4 mg. per hundred cubic centimeters brings about a satisfactory response.

6. *Toxic Effects of Sulfapyridine.*—Eleven of the patients in the control group manifested cyanosis when they were admitted to the hospital, this symptom disappearing as improvement or crisis occurred. In the sulfapyridine group sixteen children manifested cyanosis on admission and eight children did not have this symptom at that time but acquired it while receiving the drug. Seventeen of these twenty-four cyanotic patients in the sulfapyridine group continued to manifest cyanosis after their temperature fell to normal; but of these, sixteen lost their cyanosis before the end of a period of five days subsequent to the fall in temperature and while they were still receiving sulfapyridine. Since none of our patients had cyanosis to a degree to cause concern, we did not feel that it was necessary to determine the amount of methemoglobin in the blood. It is worth while noting that the cyanosis seen in our patients receiving sulfapyridine was much less than that present in patients receiving equal amounts of sulfanilamide.

In the sulfapyridine group fifteen patients manifested the symptom vomiting, but so did eleven patients in the control group. There was no definite time relationship of the vomiting to the administration of sulfapyridine. In none of the treated patients was vomiting so severe that it was necessary to discontinue the use of the drug, and in all cases vomiting soon ceased although administration of the drug was being continued.

Irritability was noted in sixteen patients in the sulfapyridine group, as compared with eleven in the control group.

In two of the patients in the sulfapyridine group generalized rubelliform maculopapular cutaneous eruptions developed, these eruptions disappearing when administration of the drug was discontinued.

Complications such as icterus, acute hemolytic anemia, granulocytopenia, acidosis, and fever which could unquestionably be attributed to sulfapyridine were not encountered.

In this study therefore the toxic effects of sulfapyridine were negligible or slight. This is at variance with certain other reports.

SUMMARY AND CONCLUSIONS

1. In a study to determine the value of sulfapyridine in the treatment of pneumonia in infants and children, no distinction was made between croupous pneumonia and bronchopneumonia. We believe that it is necessary to study a control group simultaneously with a "sulfapyridine group" and to compare such factors as age, severity of the pneumonia, and the time at which there is clinical improvement, a significant fall in the temperature and clinical recovery. An analysis of these factors is especially important in a study of pneumonia in early life, since the case fatality rate is so low that it cannot be employed as a criterion for comparison. For example, all the patients in both groups in this study recovered.

2. We observed seventy patients with pneumonia, half of whom received sulfapyridine. Analysis of the characteristics of the disease in the sulfapyridine group and in the control group demonstrated that the two groups were suitable for comparison.

3. The administration of sulfapyridine apparently shortened the course of the pneumonia by approximately three to four days. By statistical analysis it was demonstrated that the fall in temperature and the clinical recovery were significantly earlier in the sulfapyridine group than in the control group.

4. The series of cases was too small to allow evaluation of the effect of sulfapyridine in preventing complications of pneumonia.

5. Two of the patients in the sulfapyridine group manifested a course apparently uninfluenced by the drug; two other patients had a relapse, and one had a series of relapses whenever the use of the drug was discontinued. One patient in the control group had a relapse.

6. The optimum dosage of sulfapyridine needs further study. Our observations indicate that a dosage which secures a level of free sulfapyridine in the blood of approximately 4 mg. per hundred cubic centimeters is therapeutically adequate.

7. There were marked individual variations in the levels of sulfapyridine in the blood obtained with the doses we employed, namely from 1 to $1\frac{1}{2}$ grains (0.06 to 0.1 Gm.) per pound of body weight each twenty-four hours. To be sure that an adequate dosage is being maintained it is necessary to examine the blood frequently; that is, at least daily. The use of a photoelectric colorimeter makes it possible to perform determinations on 0.1 cc. of capillary blood.

8. Vomiting and cyanosis were present in about half the patients receiving sulfapyridine. The cyanosis was not sufficient to cause concern in any instance. A number of patients in the control group also manifested cyanosis and vomiting during the acute stage of their pneumonia. Two patients receiving sulfapyridine had cutaneous eruptions. None of the severer drug reactions were encountered.

9. These preliminary observations on the effect of sulfapyridine on the pneumonias of infancy and childhood and the apparent low toxicity of the drug in the doses we employed are sufficiently encouraging to warrant further study. It is our intention to continue to use the drug and to observe its effect in cases in which there are complications and, if possible, to evaluate its optimum dosage.

SUCCESSFUL TREATMENT OF DIABETIC GIRLS WITH PROTAMINE ZINC INSULIN

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AND

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Criticism adverse to the successful use of protamine zinc insulin in the treatment of diabetes led Dr. Joslin to request a brief summary of our experience with 128 diabetic girls at the Clara Barton Homestead Camp during the summer of 1938. The campers included children of all age groups, durations of diabetes and social classes. Their ages ranged from 5 to 20 years and the duration of diabetes from a few months to seventeen years. Ninety-eight were patients previously treated at the George F. Baker Clinic; thirty were referred from other sources. Of the number, eighty-

The reports unfavorable to protamine zinc insulin which we wish to refute here, claim that the disease is not well controlled, that fluctuations of glycosuria occur, that severe reactions are prevalent and that diets liberal in carbohydrate and calories cannot be employed. For purposes of this study we selected on the basis of an average two week period of observation data of the second, tenth and twelfth camp days and have summarized these in table 1. In the table the children are grouped by age and for each age the number of cases, the average duration of the disease, average weight and height, and average of all blood sugar values for fasting, 11 a. m. and 4 p. m. The diet in carbohydrate, protein and fat, regular insulin and protamine insulin with the corresponding total quantities of sugar excreted are recorded for the second, tenth and twelfth days. From this table we excluded the child who required no insulin and the four treated with regular insulin only.

Control of diabetes was measured by the amount of dextrose in grams excreted in the twenty-four hour

TABLE 1.—Summary of 123 Diabetic Girl Campers Treated at Camp in 1938

Age, Yrs	Case No	Duration of Diabetes, Yrs	Weight, Lbs	Height, In	Blood Sugar Average 5.0 Total Analyses			Record of Second Day					Record of Tenth Day					Record of Twelfth Day										
					Fasting, per Cent	11 A. M., per Cent	4 P. M., per Cent	Diet		Insulin		Diet		Insulin		Diet		Insulin										
								Carbohydrate, Gm.	Protein, Gm	Fat, Gm	Regular, Units	Protamine Zinc, Units	Sugar, Gm per 24 Hour Urine	Carbohydrate, Gm.	Protein, Gm	Fat, Gm.	Regular, Units	Protamine Zinc, Units	Sugar, Gm per 24 Hour Urine	Carbohydrate, Gm.	Protein, Gm.	Fat, Gm.	Regular, Units	Protamine Zinc, Units	Sugar, Gm per 24 Hour Urine			
5 6	6	0	47	45	0.14	0.17	0.17	164	69	77	9	+	20	124	168	67	89	11	+	23	6	169	67	78	12	+	24	12
6 3	3	3	50	47	0.15	0.13	0.17	161	71	79	10	+	21	127	151	71	75	10	+	24	10	145	73	78	12	+	25	12
8 5	5	3	60	50	0.12	0.15	0.18	172	74	79	10	+	26	147	177	74	75	9	+	27	9	158	70	82	12	+	26	12
9 5	5	4	63	51	0.16	0.20	0.22	186	84	89	12	+	25	160	204	87	89	8	+	40	4	204	91	98	12	+	26	12
10 6	6	7	68	51	0.13	0.15	0.23	195	89	96	10	+	29	131	196	87	97	9	+	38	70	196	89	97	12	+	40	12
11 12	0	0	73	51	0.12	0.14	0.20	202	92	96	11	+	34	23	201	93	96	11	+	37	11	205	93	96	12	+	31	11
12 10	4	4	87	58	0.13	0.14	0.19	195	90	92	17	+	35	26	204	93	93	15	+	37	9	208	94	93	16	+	36	11
13 17	0	0	87	60	0.14	0.17	0.19	205	94	97	15	+	35	30	215	99	97	14	+	41	11	216	100	95	15	+	34	10
14 13	4	10	101	61	0.13	0.10	0.14	196	96	98	19	+	40	25	200	97	96	14	+	39	11	201	97	97	13	+	39	10
15 16	0	0	111	62	0.15	0.17	0.17	200	93	94	19	+	43	25	208	95	92	16	+	45	12	212	97	96	14	+	46	10
16 4	0	0	117	63	0.16	0.16	0.16	208	98	99	25	+	45	26	220	98	91	18	+	49	18	214	98	94	16	+	50	12
17 12	7	120	62	0.14	0.12	0.14	208	91	89	24	+	39	26	219	97	92	18	+	44	12	211	97	92	17	+	45	12	
18 20	14	2	126	63	0.14	0.15	0.17	210	95	94	24	+	49	25	213	99	93	15	+	50	22	210	99	93	17	+	50	15

four paid nothing toward the maintenance of the camp, forty contributed something and four paid the full fee or more.

The rules governing the treatment of our own patients prior to camp had been calories per day prescribed for age, 1,000 in infancy and 100 calories added per year of age up to 2,200 for adolescent girls; for each 2 Gm. of carbohydrate, 0.9 Gm. of protein and 1 Gm. of fat had been administered in three meals and three small lunches. Protamine insulin had been used in nearly all cases. Similar diets were continued at camp. One child required no insulin, four who previously had been treated with protamine zinc insulin were treated with regular insulin at parental request, eleven were treated with protamine zinc insulin alone and 112 with regular insulin plus protamine zinc insulin. The results of previous treatment on the physical state of the child will be reported later in detail by White and Wagner but to cursory inspection and examination the average diabetic girl of this group, even after several years' duration of the disease, was taller than the Baldwin and Wood standard by 1.2 inches, weighed 3.6 pounds more than the average for height and age and was free from complications.

From the George F. Baker Clinic of the New England Deaconess Hospital, Elliot P. Joslin, medical director.

specimen of urine and the level of the blood sugar examined fasting, at 11 o'clock in the morning and at 4 in the afternoon. All three analyses were usually made on the same day. Control of diabetes based on the amount of dextrose excreted in twenty-four hours was classified as perfect if the patient was aglycosuric, excellent if the output in grams was 10 per cent or less than the carbohydrate intake, good if from 10 to 20 per cent and poor if more than 20 per cent. Thus in table 2 we record that only 4 and 6 per cent of the cases showed poorly controlled diabetes on the twelfth and tenth days respectively, and by our own definition 96 and 94 per cent, though not perfectly controlled, in the majority of instances were well controlled. It was also gratifying to note among children largely of the underprivileged class and many of whom were in the adolescent age group, that only 29 per cent had poorly controlled diabetes when they arrived at camp. This should be emphasized because some of these girls traveled long distances from other states. In fact, the homes of the patients were as follows: Massachusetts seventy-six, New York fourteen, Rhode Island twelve, Connecticut five, New Jersey five, Maine three, New Hampshire three, Vermont three, New Brunswick two, and Mississippi, Virginia, Georgia, Nebraska, Philippines, one each.

The average blood sugar was studied for age groups from 5 to 20 years and it showed an even more favorable state of control because it was nearly normal, whether analyzed fasting, at 11 o'clock or at 4 o'clock.

Fluctuations in the degree of glycosuria did occur. Thus, five of our thirteen groups divided according to present age showed more sugar in the urine on the twelfth than on the tenth day with almost exactly equal average diets and doses of insulin. This amounted to an excess of 3, 6, 7, 17 and 19 Gm. for each age period.

Severe hypoglycemic reactions occurred in 15 per cent, but 85 per cent showed none or very mild ones. Reactions were classified as severe if the patient lost consciousness or had convulsive seizures, or nausea and vomiting. None required treatment with dextrose intravenously; carbohydrate was administered by mouth or epinephrine by subcutaneous injection. The carbohydrate of the diet in the two week interval exceeded 200 Gm. in 80 per cent of the cases. The lowest prescribed diet was 133 Gm. to a 6 year old, the highest 264 to an 11 year old child. Desugarization was accomplished in all without undernutrition, with a slight increase of average carbohydrate and an almost unchanged average dose of insulin. Accuracy of regimen, because of the lack of opportunity for dietary indiscretions, and timed exercise were great aids in therapy. A few children required supplementary doses of regular insulin at noon or in the late afternoon. This was occasionally administered to twenty-two children, or 14 per cent, in the second week.

The purpose of the camp as an adjunct to the treatment of juvenile diabetes is only partly recreational but designed largely to serve the child by permitting a period of adjustment and training in an environment normal for the age, to give relaxation for worried and tired parents and to reduce the cost of medical care. The Clara Barton Homestead Camp ran ten weeks. It could have provided 180 different campers a two weeks period of treatment, but special health, economic and behavior problems reduced the number to 128 and prolonged their stay. The cost was approximately \$5,000, of which the Women's Missionary Association of the Universalist Church paid by far the greatest amount,

We believe that protamine zinc insulin was successful in the treatment of these 123 diabetic girls, controlling hyperglycemia and glycosuria even when diets liberal in calories and carbohydrates were prescribed. Reactions of moderate severity occurred in 15 per cent. Minor fluctuations of glycosuria occurred. In most instances protamine zinc insulin was supplemented by a simultaneous and smaller dose of regular insulin always before breakfast. In our opinion, camps provide a routine life normal for children and are desirable and almost necessary for the medical management of young diabetic patients in moderate circumstances.

THE MALE CLIMACTERIC

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It seems reasonable to believe that many if not all men pass through a climacteric period somewhat similar to that of women, usually in a less severe but perhaps more prolonged form. The cessation of menstruation in the female at the so-called change of life has been tangible evidence for ages that the woman is having a decline in her sex function and is approaching the end of her child-bearing period. This cessation of menstruation in the female, usually called the menopause, is not the climacteric but represents only visible evidence that the woman is having endocrine imbalance. The endocrine dysfunction, plus the imbalance of equilibrium between the two divisions of the autonomic nervous system, with evidence at times of disturbance in the psychic centers, is the climacteric. The true climacteric is due primarily to decline of function of the sex glands. Decline of sex function is not limited to women but is also a heritage of all men. With the decline of gonadal function in the male there is a decrease of potency and libido. However, since libido has more of a mental and psychic basis and is to a great extent volitional, this factor may be affected to a less extent. In many instances the loss of potency and the persistence of libido causes many men to consult the physician.

The onset of decline of sex function in men is usually later than in women. The average age of onset for women is about 40.8 years and for men approximately 48 to 52 years. Probably a greater number of men than women pass through the climacteric without evident disturbance. Again, because of the prevalent belief that men do not have a climacteric period (which has been based on cessation of menstruation in women) the condition has probably been overlooked or ignored in men. Cessation of menstruation does not necessarily imply complete loss of libido in all women; neither does decrease of gonadal activity or the climacteric in men eventuate in total loss of potency, and certainly not of libido. That some few men are capable of fertilization (production of viable spermatozoa) to the advanced age of 80 years and beyond is an accepted fact, but this does not militate against the evidence that many men show beginning decline of potency at about 50 years of age, and during this period in life they have the typical climacteric syndrome which is mitigated by treatment with male sex hormones.

To refresh the memory, the symptoms complained of by 197 women (fifty-three castrates, ninety-six meno-

TABLE 2.—Control of Diabetes in 123 Girl Campers on the Second, Tenth and Twelfth Camp Days, Measured by the Ratio of Dextrose Output to Carbohydrate Intake

Day of Observation	Number of Girls	Perfect, per Cent	Excellent, per Cent	Good, per Cent	Poor, per Cent
Second	123	14	32	25	29
Tenth.....	110	23	49	20	6
Twelfth.....	107	32	47	17	4

approximately \$2,500 in addition to providing the plant, which represents a valuation of perhaps \$20,000, the Fund for the Study and Care of Diabetes from the George F. Baker Clinic \$1,500, and the children \$1,000. This camp unit is one of six where some 250 of our children received treatment with similar results during the summer of 1938. The medical staff includes a head nurse, an assistant nurse, a dietitian, a laboratory technician, play supervisors, a housemother, but no physician on the grounds. Diets are weighed, charts of the hospital type are kept, the amount of sugar excreted in twenty-four hours is determined daily by the Sheftel method, and capillary blood sugars are done by the Folin method.

pause and forty-eight involutinal melancholia patients) having deficiency or absence of the ovarian follicular hormone are presented in tabular form.

The climacteric symptoms in men may be classified as in women as nervous, circulatory and general in distribution. Among the more prominent symptoms may be mentioned intense subjective nervousness, definite emotional instability characterized by irritability, sudden changes in mood, decreased memory and ability for mental concentration, decreased interest in the usual activities, a desire to be left alone, and depression and crying. They may have hot flushes, which may be accompanied by profuse perspiration or be followed by a chilly sensation. There may be tachycardia and palpitation even while lying in bed and tachycardia, palpitation and dyspnea on moderate effort, vertigo

Order of Frequency of Symptoms Complained of in 197 Cases

Order of Frequency of Symptoms	Per Cent
1. Menstrual disturbances.....	99.2
2. Nervousness, subjective.....	97.6
3. Hot flushes.....	89.0
4. Excitability.....	85.7
5. Fatigability and lassitude.....	83.7
6. Depression and crying.....	77.4
7. Constipation.....	76.2
8. Irritability.....	75.1
9. Tachycardia, palpitation and dyspnea.....	68.8
10. Vertigo.....	67.4
11. Decreased memory and concentration.....	66.8
12. Sleep disturbed.....	66.1
13. Amenorrhea.....	57.6
14. Headache.....	56.4
15. Psychosis.....	52.2
16. Occipitocervical aching.....	50.6
17. Scotomas.....	49.4
18. Numbness and tingling.....	48.3
19. Cold hands and feet.....	35.3
20. Formication.....	25.4
21. Vague pains (recorded for involutinal melancholia).....	77.1

with or without change of position, scotomas, tinnitus, numbness and tingling of the extremities, fatigability and disturbed sleep.

The neurocirculatory symptoms such as hot flushes and suddenly increased perspiration, chilly sensations, vertigo, scotomas, tachycardia and palpitation, and numbness and tingling occur irregularly; they may be of frequent occurrence for a few days and then there may be a short period of relative freedom, only to recur.

The symptoms which are mental and psychic, such as irritability, changes in mood, decreased memory and concentration, loss of interest, restlessness and depression and crying, are usually more constant.

The climacteric disturbance may be so severe in some men that they become despondent and develop a psychosis with thoughts of self destruction. It is very probable that many men have committed suicide and no one could understand the reason for their having done so. That men have involutinal melancholia can be confirmed by psychiatrists, for most institutions caring for mental cases have had these patients.

Recently Miller, Hubert and Hamilton¹ reported treatment of six male patients with testosterone propionate; two were adult castrates, two had hypogonadism and two apparently had psychic impotence. The doses varied from 20 mg. daily to three times weekly and were carefully controlled by injections of appropriate series of the oily solvent only. In addition to markedly diminished sexual libido and inadequate penile erec-

tions, these patients, prior to treatment with testosterone propionate were disturbed, anxious and broken in spirit. They ranged from moderate to severe states of mental depression. The four definitely organic cases displayed additional symptoms. These patients suffered from vasomotor disturbances (hot flushes), such as women may experience at the menopause, and manifested very definite emotional instability characterized by sudden uncontrollable shifts in mood, by tendencies to break down into tears, by periods of extreme irritability and sometimes by sullen anger. They also exhibited moderate to extreme degrees of both physical and mental fatigability. They complained of difficulties in concentration and of general apathy. Adequate treatment with testosterone propionate was causally associated with remarkable clinical improvement characterized by a marked increase in the erectile capacity and sensitivity of the penis, in the strength of the sex urge and in the capacity to respond with the proper emotions not only to intercourse but also to other acts such as kissing or embracing. During adequate treatment the two castrates appeared restored to normal in these respects. Also normal sex function and motivation were accompanied by great changes in the entire mental attitude of all patients. Their previous despondency gave way to definite elation, which in one psychogenic case (E) tended to wear off. All patients were less broken in spirit and were more spontaneous in their interests and activity. It is particularly interesting to note that additional changes occurred in the organic cases which were not observed in those without demonstrable hormonal abnormalities. The symptoms listed as peculiar to the organic cases were alleviated. They exhibited more rational aggressiveness and less irrational irritability and sullen brooding. Nervousness and emotional instability were replaced by greater stability and control. Abnormal physical and mental fatigability disappeared. Energy and stamina returned.

REPORT OF CASES

The following patient was in the male climacteric when he consulted me:

CASE 1.—*History*.—W. K., aged 50, married, whose weight had been stationary at 160 pounds (73 Kg.) for five years, had always had good health and been successful, and his social contact had been normal. He had been subjectively nervous for several years, which condition had become worse during the last three or four years. For seven or eight years he had been aware of being excitable and irritable and lately he had been mentally depressed and had cried many times for no good reason. He had noticed hot flushes occasionally for about eight years; these occurred two or three times a month and might last one hour. During the past three years he had had a numbness and tingling of the extremities even while lying in bed, tachycardia, palpitation and dyspnea more than usual on moderate effort, easy fatigability, frequent scotomas and vertigo occasionally with occipitocervical aching and frontal headaches six or seven times a month, which might last from twenty-four to thirty-six hours. During the past two years he had had decreased memory and ability for mental concentration, and when this was accompanied by the occipitocervical aching his mind seemed hazy and fogged. He was fatigued most of the time and had lost interest in things. He slept poorly and lay awake from one to three hours each night.

He had measles and pertussis in childhood. In 1930 his appendix was removed but he stated that it was normal and that he did not get relief from the operation. A hydrocele was operated on two years before.

He had been married three times and had no children. The family history was negative as regards the patient.

1. Miller, N. E.; Hubert, Gilbert, and Hamilton, J. B.: Mental and Behavior Changes Following Male Hormone Treatment of Adult Castration, Hypogonadism and Psychic Impotence, *Proc. Soc. Exper. Biol. & Med.* 38: 538-540 (May) 1938.

Examination.—His temperature was 98 F. at noon. His height was 67 inches (170 cm.) and his weight 153½ pounds (70 Kg.). His upper and lower measurements and one half span were equal at 36 inches. The genitals were normal. There were no abnormal physical signs. The pulse rate was 84 and the blood pressure 140 systolic, 100 diastolic.

The hemoglobin was 106 per cent (Sahli). The red cells numbered 5,380,000 and the white cells 8,700. There were no abnormal blood cells.

Urinalysis revealed neutral reaction, normal albumin and sugar tests and microscopically an occasional leukocyte but no casts.

The basal metabolic rate (two tests) was minus 2.5 per cent and minus 4.5 per cent.

The fluoroscopic examination of the chest, the heart, the stomach and the colon gave negative results.

The diagnosis was male climacteric.

Treatment and Results.—One cc. of testosterone propionate (perandren²) 10 mg. in oil was injected intramuscularly three times a week. After four weeks of treatment his subjective symptoms had markedly improved and he remarked that the depressed feeling was gone and he felt cheerful. He was treated for three months and his symptoms disappeared. After he had discontinued treatment for three months the symptoms began to return.

The following patient is a partial castrate with atrophy of the remaining testicle:

CASE 2.—History.—W. C. H., aged 42, married, stated that his sexual development was normal except for a left inguinal hernia, which was operated on in 1913. This was almost immediately followed by a hydrocele on that side. The hydrocele was then operated on and the left testicle atrophied. In 1927 a right herniotomy was done and the surgeon removed the left testicle because it was atrophied. The hernia on the right side recurred and he was again operated on for this. The day following the last operation the testicle was greatly swollen and painful, and since then he had lost the function of this gland.

For six weeks following the last operation he had decline of sexual potency to complete loss. He had sexual desire but had no erection for several months until he was treated, as will be described. With this loss of testicular function he became intensely nervous subjectively and had hot flushes almost every hour, which were accompanied by profuse perspiration. He was depressed and cried frequently for no reason. His memory and ability for mental concentration were decreased. He was restless and was ill at ease and worried. During the past three months he had had fatigability and a dull frontal headache each afternoon, which persisted until after he retired.

He was married and had a grown son and daughter.

Examination.—His height was 69 inches (175 cm.) and his weight 183 pounds (83 Kg.). His pulse rate was 76 per minute and the blood pressure was 130/80. The patient appeared to be ten years older than his age. There were no abnormal physical signs except the genital condition. The left testicle was absent; the right testicle was moderately decreased in size and its consistency was very hard. The epididymis was shrunken, hard and sclerosed.

The blood and urine were normal.

The diagnosis was castrate, left side; testicular atrophy, right side.

Treatment and Result.—The patient was given injections of testosterone propionate (perandren) 10 mg. in oil intramuscularly three times a week during the first month, twice a week the second month and once a week the third month. After the third injection he had an erection and coitus with an orgasm. He had not had an erection for nine months previous to this time. On a dosage of three injections a week during the first month he had three to four erections each week.

During the second month on a 10 mg. dose twice a week the erections occurred only once a week. During the third month on a 10 mg. dose once a week he had no more erections.

During the first month of treatment, on a dosage of 10 mg. three times a week, all his subjective symptoms disappeared. It

requires three injections weekly to maintain him at normal. After the third month he discontinued treatment and quickly reverted to his original condition, both physically and subjectively.

COMMENT

Patient 1 had the symptoms complained of by women in the climacteric. These symptoms were relieved by injections of testosterone propionate and his interest in normal activities returned.

Patient 2 is a unilateral castrate with atrophy of the remaining testicle following a herniotomy. He had the same symptoms that are complained of by female castrates, with loss of sex function. His subjective symptoms were relieved, a cheerful attitude returned and the function of the erectile tissue of the genitals was restored as long as he received adequate doses of testosterone propionate.

CONCLUSIONS

1. It is evident that (some) men develop a typical climacteric syndrome at about the age of 50. It is reasonable to believe that with decline of gonadal function this should occur in men.

2. Testosterone propionate relieved the subjective symptoms in two male patients and restored the function of erectile tissue in the male sex organs of a castrate.

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THE INFLUENCE OF MALARIAL INFECTIONS ON THE WASSERMANN AND KAHN REACTIONS

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Many contradictory opinions and results regarding the ability of malaria to provoke nonspecific, positive reactions with both the complement fixation and the flocculation test for syphilis have found their way into the literature. Lloyd and Mitra¹ summarized the reports on the question of falsely positive reactions which had been published up to the time they wrote, and they added data on eighty-five cases of their own. They believe that there is no evidence that malaria causes positive serologic reactions with modern techniques. In a subsequent publication the senior author² of the former paper expressed the opinion that "the occurrence of positive reactions in malaria is partly a question of technic and partly a question of concomitant syphilis . . . it is only with very sensitive technics that a positive Wassermann will be obtained in malaria and even then the reaction is weak . . ." Kolmer³

Drs. Mark F. Boyd and T. B. Turner gave helpful suggestions and criticism during the prosecution of this study.

From the Station for Malaria Research, Tallahassee, Fla. (Dr. Kitchen); the laboratory of the Georgia State Department of Health, Atlanta, Ga. (E. L. Webb) and the Florida State Hospital, Chattahoochee, Fla. (Dr. Kupper).

The studies and observations on which this paper is based were conducted with the support and under the auspices of the International Health Division of the Rockefeller Foundation, in cooperation with the Florida State Board of Health and the Florida State Hospital.

1. Lloyd, R. B., and Mitra, G. C.: The Wassermann Reaction in Malaria, *Indian J. M. Research* 14: 135 (July) 1926.

2. Lloyd, R. B.: Interpretation of Wassermann Results in India; Twelve Years' Experience in Calcutta, *Indian M. Gaz.* 67:1 (Jan.) 1932.

3. Kolmer, J. A.: Specificity, Sensitiveness and Practical Value of Kolmer-Wassermann Reaction, *Am. J. Syph.* 13:248 (April) 1929.

2. Mr. Robert C. Mautner and the Ciba Company, Summit, N. J., supplied the testosterone propionate used.

stated that in his experience malaria, among other infections, had no influence per se on the Wassermann reaction, although the serums in acute febrile diseases might become somewhat more anticomplementary than usual. In a subsequent paper he⁴ reported uniformly negative reactions in nonsyphilitic patients with tertian and estivo-autumnal malaria and stated "I am of the firm belief that the serums of nonsyphilitic malarial patients do not yield falsely positive reactions with my new method, even when the blood is drawn just before, during or after a paroxysm of chills and fever." Of interest in this connection are the results of an extensive study⁵ conducted under the sponsorship of the United States Public Health Service. Specimens of serums

TABLE 1.—Nonsyphilitic Patients with Malaria Examined for Reaction to Serologic Test for Syphilis

Case	Sex	Age	Type of Infection*	Days from Inoculation to First Paroxysm	Days from Inoculation to First Fever	Duration of Clinical Attack, Days	Termination of Attack, Active	First Positive Serologic Test, Days After Inoculation	Days from First Positive Test
Series 1									
268	♂	30	V	11	13	41	S	17	33
270	♂	31	V	12	11	39	S	24	24
273	♂	22	V	11	12	31	S	18	19
274	♂	30	V	11	11	46	S	21	18
276	♂	23	V	11	13	12	S	29	8
278	♂	47	V	16	18	53	S	12	57
280	♂	37	V	12	14	45	S	23	32
284	♂	21	V	16	17	37	S	22	11
286	♂	24	V	16	17	49	Q	21	29
271-			V and						
1126	♂	21	F	11	12	72	Q	17	66
277-			V and						
1128	♂	60	F	11	13	16	Q	35	11
1127	♂	24	F	11	12	17	Q	12	19
1129	♂	41	F	11	12	45	Q	16	27
1130	♂	23	F	10	12	62	Q	5	54
1132	♂	40	F	13	15	45	S	23	8
1137	♂	29	F	11	12	16	S	11	42
253	♂	14	(V) Malaria did not develop					0	0
257	♂	26	(V) Malaria did not develop					0	0
258	♂	20	(V) Malaria did not develop					11	32
1136	♂	30	(F) Malaria did not develop					30	9
Series 2									
304	♂	18	V	10	11	7	Q	24	43
306	♂	28	V	11	14	59	S	20	36
308	♂	28	V	11	30	11	S	20	10
313-		23	F	11	16	40	S	22	54
1151	♂		V	15	20	34	S	24	29
1147	♂	25	F	11	12	8	S	27	22
1148	♂	20	F	11	12	8	S	26	42
1149	♂	23	F	11	10	28	S	20	8
1150	♂	31	F	9	10	24	S	27	11
305	♂	23	(V) Malaria did not develop					0	0
307	♂	32	(V) Malaria did not develop					0	0
255	♂	14	(V) Uninoculated					0	0

* V = vivax † S = spontaneous
F = falciparum Q = quinine

from nonsyphilitic persons with malaria or other diseases were distributed to a number of serologists who performed Wassermann or Kahn tests. Kolmer's laboratory reported positive Wassermann reactions for 19.4 per cent of the specimens obtained from patients with malaria. In the four laboratories in which these complement fixation tests were done the percentage of positive results for the malaria patients ranged from 8.6 to 20.6. Hazen and his associates⁶ obtained positive results in 8 per cent of tests on 266 patients with malaria, presumably nonsyphilitic, and noted a higher

proportion of positive reactions among females, particularly among those under the age of 10 years and from 60 to 69 years of age.

Other authors, namely Taussig and Orgel,⁷ who cite the nonspecific results of a number of observers as varying from 4.9 to 80 per cent, Curth,⁸ and Wilson and Levin,⁹ who report one instance of a positive complement fixation on the cerebrospinal fluid in malaria, have also found various proportions of falsely positive reactions from malarial blood. On the other hand, Needles,¹⁰ Menk,¹¹ Greer¹² and Heinemann¹³ had the opposite experience. Saunders and Turner¹⁴ also concluded that malaria does not cause fixation of complement with the method they used but that it might act as a provocative agent to raise a low titer reaction to the complement fixation threshold.

The present study was undertaken in an attempt to clarify this confusing situation by a new approach utilizing the opportunity presented by a decision to administer malaria therapy to a group of nonsyphilitic patients with functional psychoses. This permitted the systematic observations to be described and provided a restricted, although small, population.

The patients included in the study were divided into two series, in both of which there were persons who had malaria and nonmalarial controls. Table 1 presents pertinent data on all the patients. In all but two instances the histories of the patients, when obtainable, were negative for previous syphilitic infection. Two patients (270 and 1147) stated that they had had genital lesions that had not been treated. Physical examination failed to reveal evidence of syphilis in any of the patients. Moreover, routine serologic examination of the blood and spinal fluid made on all of them on admission to the hospital had given negative results.

FIRST SERIES

The first study group was composed of twenty persons. Nine of these were inoculated with *Plasmodium vivax*, two with *Plasmodium falciparum* and the remaining nine with the two species simultaneously. All inoculations were made with infected mosquitoes between May 5 and June 21, 1937. Specimens of serum to serve as controls were withdrawn from each patient prior to the first recognition of parasites in the peripheral blood; from two to four samples of serum were secured from each before inoculation. Subsequent specimens were taken at semiweekly intervals throughout the course of the malarial attack and until the results were negative. The Wassermann tests and some of the Kahn tests were performed by Mr. R. E. Morgan in the laboratory of the Florida State Hospital; the remaining Kahn tests were done in the branch laboratory of the State Board of Health at Tallahassee through the cooperation of Miss Estelle Bryan. The antigen used in this series of Wassermann tests was an

7. Taussig, A. E., and Orgel, M. N.: Kahn Test in Malaria, *J. L. & Clin. Med.* 22: 614 (March) 1937.

8. Curth, H.: Syphilis in Highlands of Guatemala, *Am. J. Syph.* 17: 164 (April) 1933.

9. Wilson, R. J., and Levin, A. L.: Observations on Effect of Malaria on Wassermann Reaction, *Am. J. M. Sc.* 191: 696 (May) 1937.

10. Needles, R. J.: Effect of Endemic Malaria on Incidence of Neurosyphilis, *Arch. Neurol. & Psychiat.* 24: 618 (Sept.) 1935.

11. Menk, W.: A Comparison of the Complement Fixation Test (Wassermann Reaction) and Meinicke's Turbidity Reaction (M. T. R.) in Serodiagnosis in the Tropics, United Fruit Company, Medical Department, Annual Report, 1926.

12. Greer, A. E.: Routine Blood Wassermann Reaction in Private Practice, *Texas State J. Med.* 19: 485 (Jan.) 1924.

13. Heinemann, H.: Untersuchungen über den diagnostischen Wert der Methoden von Wassermann, Sachs-Georgi und Meinicke (D. M.) in Malarialändern (Das Verhalten des Bluteserums bei Malaria), *Münch. med. Wchschr.* 68: 1551 (Dec. 2) 1921.

14. Saunders, G. M., and Turner, T. B.: Wassermann Reaction in Malaria, *South. M. J.* 28: 542 (June) 1935.

4. Kolmer, J. A.: Truths About Serum Diagnosis of Syphilis, with Especial Reference to Kolmer and Kahn Reactions, *J. A. M. A.* 93: 1429 (Nov. 9) 1929.

5. Cumming, H. S.; Hazen, H. H.; Sanford, A. H.; Seneac, F. E.; Simpson, W. M., and Vonderlehr, R. A.: Evaluation of Serodiagnostic Tests for Syphilis in United States: Report of Results, *J. A. M. A.* 104: 2083 (June 8) 1935.

6. Hazen, H. H.; Seneac, F. E.; Parran, Thomas; Sanford, A. H.; Simpson, W. M., and Vonderlehr, R. A.: Serologic Evidence of Syphilis in Malarial Patients, *Arch. Dermat. & Syph.* 37: 431 (March) 1938; abstr. *J. A. M. A.* 110: 1629 (May 7) 1938.

alcoholic extract of beef heart fortified with 0.4 per cent cholesterol as furnished by Mulford Colloid Laboratories. The complement was titrated prior to performance of the test. A preliminary incubation period of thirty minutes at 37 C. before the addition of the hemolytic system was followed by one hour's incubation at 37 C. In the case of the Kahn tests the standard antigen was employed. In the tests performed at the hospital the standard Kahn antigen used was that supplied by the Digestive Ferments Company. The central laboratory of the Florida State Board of Health prepares its own antigen, which is standardized in Kahn's laboratory.

SECOND SERIES

The second group comprised ten inoculated persons and one uninoculated control. In the control (case 285 of the first series), clinical malaria had failed to develop following inoculation. Five of these patients were inoculated with *P. falciparum* and five with *P. vivax*. Two of the vivax inoculations were unsuccessful. One of the patients inoculated with *P. falciparum* (313-1151) was reinoculated with *P. vivax* while convalescing from a falciparum infection. This patient's clinical experience, therefore, has been classified statistically as two separate attacks, one of falciparum and one of vivax, making a total of nine infections in series 2. As in the previous series, these patients were all inoculated with infected mosquitoes, the inoculations taking place between Nov. 19 and Nov. 23, 1937. The serologic tests in this group were carried out in the laboratories of the Georgia State Board of Health, Atlanta, through the collaboration of Dr. T. F. Sellers, director, and differed from the previous run in that the presumptive Kahn test was done in addition to the Wassermann and standard Kahn tests. The Kahn tests in this series were performed as outlined by Dr. Kahn, and the antigens used were standardized in his laboratory. The complement fixation technic employed was a three tube Kolmer modification in which 10 units of the latter's cholesterolized antigen was used. Two full units of guinea pig complement was used, and both amboceptor and complement were titrated prior to use. Primary incubation was carried out for from fourteen to eighteen hours at 6 to 8 C. followed by from ten to fifteen minutes at 37 C. The hemolytic system was then added, and incubation at 37 C. was continued until ten minutes after the negative controls showed complete hemolysis.

Prior to inoculation, from five to eleven specimens of serum were obtained from each patient in this series. Following inoculation, specimens were collected at semiweekly intervals until three completely negative results were reported for each patient.

In addition to these tests a duplicate specimen of serum from each of two patients (304 and 1147) in series 2 was frozen and stored at about -7 C. in a freezing chamber each time blood was taken from these persons for current examination. The specimens were finally sent to the laboratory in the frozen state and tested simultaneously.

RESULTS

It will be noted in table 1 that double infections developed in only two (271-1126 and 277-1128) of the nine doubly inoculated patients in series 1. The nature of these infections has been described in another publication.¹⁵ Three of the nine experienced vivax attacks

TABLE 2.—Results of Serologic Tests for Syphilis in Relation to Malarial Activity

Case	Type of Test*	Stage of Attack When Specimen Secured														Results from All Stages	Total
		Before Inoculation		During Incubation Period		During Malarial Attack		After Malarial Attack				Pos.	Neg.				
								0-14 Days		Over 14 Days							
		No. Pos.	No. Neg.	No. Pos.	No. Neg.	No. Pos.	No. Neg.	No. Pos.	No. Neg.	Pos.	Neg.						
		Series 1															
268	W	0	1	0	1	8	2	4	0	1	2	13	6	19			
	K	0	2	0	4	9	9	1	5	0	5	10	25	35			
270	W	0	1	0	1	4	5	1	1	1	1	6	9	15			
	K	0	2	0	3	8	11	1	2	1	2	5	20	25			
273	W	0	1	0	2	3	3	0	3	..	..	3	9	12	
	K	0	2	0	4	6	8	0	5	..	..	6	19	25	
274	W	0	1	0	2	5	6	0	3	..	..	5	12	17	
	K	0	2	0	4	8	12	0	4	..	..	8	22	30	
276	W	0	1	0	1	0	2	3	1	..	..	3	5	8	
	K	0	1	0	4	0	6	2	4	..	..	2	15	17	
278	W	0	1	0	5	12	3	..	..	..	..	12	9	21
	K	0	2	1	6	12	10	..	..	..	..	13	18	31
280	W	0	1	0	3	5	9	0	1	..	..	5	14	19	
	K	0	2	0	4	4	17	0	1	..	..	4	24	28	
284	W	0	2	0	4	3	5	..	..	..	..	3	11	14
	K	0	2	0	6	1	13	..	..	..	..	1	21	22
286	W	0	2	0	4	7	2	..	..	..	..	7	8	15
	K	0	2	0	5	3	12	..	..	..	..	3	19	22
271-1126	W	0	1	0	1	16	3	0	1	..	..	16	6	22	
	K	0	2	0	4	12	21	0	2	..	..	12	29	41	
277-1128	W	0	1	0	1	0	5	1	2	1	3	2	12	14			
	K	0	1	0	4	0	10	0	0	0	5	0	26	26			
1127	W	0	1	0	1	3	0	1	0	..	..	4	2	6	
	K	0	2	0	4	0	8	0	1	..	..	0	15	15	
1129	W	0	1	0	1	3	15	0	1	..	..	3	18	21	
	K	0	2	0	4	2	24	0	1	..	..	2	31	33	
1130	W	0	1	1	0	7	12	1	0	4	9	17	26				
	K	0	2	0	4	2	26	0	1	0	4	2	37	39			
1133	W	0	1	0	4	2	10	0	2	..	..	2	17	19	
	K	0	2	0	5	1	18	0	2	..	..	1	27	28	
1137	W	0	1	0	2	2	3	3	0	3	2	8	8	16			
	K	0	1	0	4	2	5	5	1	1	7	8	18	26			
285	W	0	2	0	6	Malaria did not develop						0	8	8			
	K	0	2	0	10							0	12	12			
287	W	0	2	0	9	Malaria did not develop						0	11	11			
	K	0	2	0	14							0	16	16			
288	W	0	2	4	8	Malaria did not develop						4	10	14			
	K	0	2	0	17							0	19	19			
1136	W	0	1	2	12	Malaria did not develop						2	13	15			
	K	0	1	1	21							1	22	23			
Series 2																	
304	W	0	2	0	4	0	6	1	5	0	20	1	37	38			
	PK	0	2	0	4	0	6	6	2	10	9	16	23	39			
	SK	0	1	0	4	0	5	5	3	3	15	8	23	36			
306	W	0	3	0	3	8	7	0	3	0	1	8	17	25			
	PK	0	2	0	3	10	6	0	2	0	1	10	14	24			
	SK	0	1	0	3	8	8	0	4	0	1	8	17	25			
308	W	0	3	0	1	0	4	0	3	0	5	0	16	16			
	PK	0	2	0	2	1	3	4	0	1	3	6	10	16			
	SK	0	1	0	1	1	3	2	2	0	4	3	11	14			
1151	W	0	4	0	3	5	5	0	2	0	3	5	17	22			
	PK	0	3	0	3	9	3	4	0	2	1	15	10	25			
	SK	0	2	0	3	7	6	1	3	0	3	8	17	25			
313	W	..	..	..	..	5	2	0	3	0	1	5	6	11
	PK	..	..	..	..	9	1	0	2	0	1	9	4	13
	SK	..	..	..	..	3	7	0	4	0	1	3	12	15
1147	W	0	4	0	5	0	4	4	3	5	4	9	20	29			
	PK	0	3	0	6	0	4	2	5	7	3	9	22	31			
	SK	0	3	0	5	0	4	1	6	3	7	4	25	29			
1148	W	0	4	0	2	1	7	0	4	0	2	1	19	20			
	PK	0	3	0	2	5	6	1	1	0	2	6	14	20			
	SK	0	2	0	2	3	8	0	4	0	2	3	18	21			
1149	W	0	3	0	3	0	7	0	4	0	1	0	18	18			
	PK	0	3	0	3	3	3	0	4	0	1	3	14	17			
	SK	0	2	0	3	1	7	0	4	0	1	1	17	18			
1150	W	0	4	0	2	4	4	0	4	..	..	4	14	18	
	PK	0	3	0	2	4	6	0	4	..	..	4	15	19	
	SK	0	2	0	2	3	7	0	4	..	..	3	15	18	
305	W	0	3	0	17	Malaria did not develop						0	20	20			
	PK	0	2	0	17							0	19	19			
	SK	0	1	0	16							0	17	17			
307	W	0	3	0	17	Malaria did not develop						0	20	23			
	PK	0	2	0	17							0	19	19			
	SK	0	1	0	17							0	18	18			
285	W	0	1	0	22	Uninoculated						0	23	23			
	PK	0	1	0	22							0	23	23			
	SK	0	1	0	22							0	23	23			

15. Boyd, M. F., and Kitchen, S. F.: Vernal Vivax Activity in Persons Simultaneously Inoculated with *P. Vivax* and *P. falciparum*, Am. J. Trop. Med. 18: 505 (Sept.) 1938.

* W = Wassermann, K = Kahn, PK = Presumptive Kahn, SK = Standard Kahn.

alone, which together with the six other successful vivax inoculations in this series provided nine infections with that species. In the remaining four doubly inoculated persons the infections were predominantly falciparum, bringing the total of falciparum attacks up to five. In series 2, patient 313-1151 was inoculated successively with *P. falciparum* and *P. vivax*, and there were in addition three single vivax and four falciparum infections.

In four persons (285, 287, 288 and 1136) in the first series clinical malaria failed to develop, and no malarial parasites were observed in their blood at any time. Of these, one (288) showed four positive Wassermann reactions. Another (1136) exhibited two positive Wassermann reactions, one anticomplementary specimen and one positive Kahn reaction. In case 288, an elevation of the temperature to 38.3 C. (100.9 F.) was observed two days after the first positive serologic reaction. No possible explanation other than a hook-

plement fixation test was doubtful, but both of the Kahn reactions were strongly positive. These positive serologic reactions obtained from a person in whom malaria developed and who had had so many negative control reactions previously serve to corroborate our other observations.

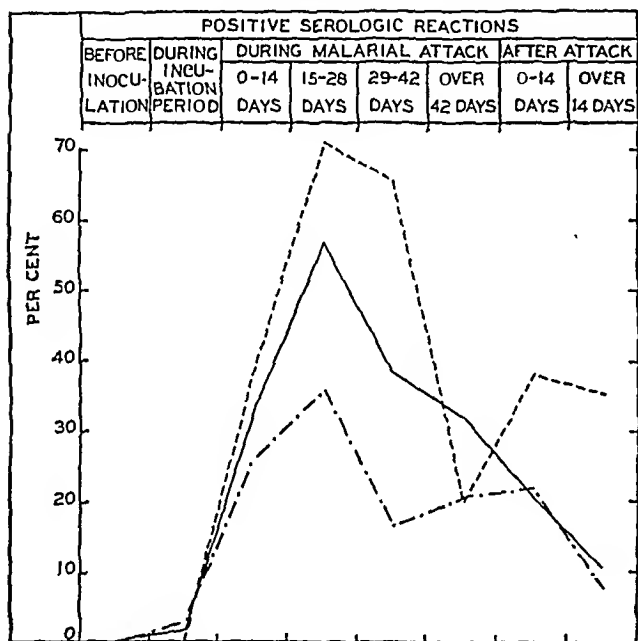
As may be further noted in table 1, the incubation periods (terminated by the first recognition of parasites in thick blood films) observed for the twenty-five malarial infections ranged from nine to sixteen days. In fifteen cases it was eleven days. In nine each of the vivax and falciparum cases it fell within the first twelve days. The initial fever was observed to occur on the tenth to the twentieth day after inoculation, with the greatest incidence on the twelfth day (eight cases).

In table 2 are presented the number of positive and negative serologic results observed in each case. These results are further classified according to the type of test and in relation to the stages of the malarial infection. The four divisions selected for the latter purpose are, as will be seen in the table, (1) before inoculation, (2) during the incubation period, (3) during the malarial attack (terminated by the final paroxysm or elevation of the temperature to at least 37.8 C. and (4) after the malarial attack. It should be remarked that the results in case 313-1151 in series 2 have been listed separately for each infection, namely those for the falciparum infection under case 1151 and those for the succeeding vivax attack under case 313. The second attack in this instance followed so closely on the first that it was not possible to present complete data for it in the table. The results obtained for the persons who were not inoculated or in whom malaria did not develop are placed for convenience under the column headings "before inoculation" or "during incubation period."

It will be observed that in each of the twenty-five attacks in both series positive serologic reactions were obtained on at least two occasions at some time during the course of the malarial infection.

It will also be noted that no specimen obtained prior to the time of inoculation yielded a positive result; thus the observations made on admission in all the cases were substantiated. During the incubation period, as table 2 further shows, each of two patients (278 and 1130) exhibited one positive reaction. In the former case the Kahn reaction was positive twelve days after inoculation, although it was not until four days later that parasites were first observed. Between the first and subsequent positive reactions, a period of fourteen days, three negative Wassermann and five negative Kahn reactions were obtained. In case 1130 the first positive Wassermann was noted five days after inoculation and five days prior to the first appearance of parasites. This result, however, was followed by five consecutive positive reactions to the complement fixation test. In addition to these two patients, one other (268) showed one doubtful Wassermann reaction ten days after inoculation and one day before the first detection of parasites. The four subsequent Wassermann reactions in this instance were positive.

It is apparent that considerable variation existed among these cases with reference to the incidence of positive reactions as well as in the distribution of the latter in relation to the stage of the malarial infection. In series 1 there were two patients (1127 and 277-1128) who at no time throughout the course of the infection gave a positive Kahn reaction. One of these (1127), however, did give 100 per cent positive Wassermann



Positive serologic reactions with each type of test. Solid line, Wassermann; broken line, presumptive Kahn; dots and dashes, standard Kahn.

worm infection was discoverable. The other person (1136) experienced no elevation of temperature, but a diagnosis of tubo-ovarian disease had been made. While these conditions may have had no significance, they were the only infections found in the two persons exhibiting positive serologic reactions.

In the second series were two persons (305 and 307) in whom malaria did not develop, and one uninoculated person (285 of the first series) was included to serve as a negative control. None of these three patients showed positive reactions or malarial parasites at any time during the period of observation. April 19, 1938, however, patient 285 experienced a rigor. Smears prepared from his peripheral blood on April 22, when he first came to the attention of the malaria therapy service, proved to contain *P. vivax*. The clinical course was pure tertian. It seems likely that this patient's infection resulted from his inoculation of June 21, 1937. This would mean an incubation period of more than ten lunar months, which is new in our experience. Wassermann, presumptive Kahn and standard Kahn tests were performed on his serum April 22. The com-

reactions during the attack. There was no instance of 100 per cent negative Wassermann reactions in this series. In series 2 there were two persons (308 and 1149) who failed to exhibit a single positive Wassermann reaction but none showing totally negative Kahn reactions.

As may be seen in table 2, there were in all four persons (276, 277-1128, 304 and 1147) who failed to show positive serologic reactions prior to the conclusions of the malarial attack. In two of these (277-1128 and 304) it had been necessary to terminate the attack because of the development of an intercurrent infection. The clinical duration of the plasmodial infection in the other two had been relatively short (twelve days in case 276 and eight days in case 1147).

In nineteen of the twenty-five attacks studied, the first positive reactions were encountered some time during the febrile phase of the disease. The first positive reactions varied, however, in their time of appearance from the day of onset to seventeen days after the initiation of clinical activity. It may be determined from table 1 that in seventeen of the nineteen, or 68

results from the first to the last positive reaction with one or more tests. Six patients of the first series exhibited consistency with the Wassermann reaction and one of these with the standard Kahn as well. In the second group, eight patients showed regularity in serologic positivity with the complement fixation (three cases), presumptive Kahn (six cases) and standard Kahn tests (four cases). The remaining patients of the two series presented doubtful and negative results interspersed among the positive reactions. In some of the latter cases the appearance of intervening negative or doubtful results appeared to be associated with a brief subsidence of the paroxysms, which frequently occurs in the course of the clinical attack, but in the majority of the serologic irregularities no such relationship was demonstrable. Alterations in the parasite density were considered as a potential factor, but here again the association was not constant. In many instances no possible cause, and certainly no constant factor, was apparent.

With further reference to the period from the first to the last positive serologic reaction there were observed

TABLE 3.—Results of Serologic Tests for Syphilis in Relation to Malarial Activity

Series 1	Type of Test*	Before Inoculation			During Incubation Period			During Period of Malarial Attack												After Termination of Clinical Activity					
								0-14 Days			15-28 Days			29-42 Days			Over 42 Days			0-28 Days			Over 28 Days		
		No. Tested	No. Pos.	Per Cent Positive	No. Tested	No. Pos.	Per Cent Positive	No. Tested	No. Pos.	Per Cent Positive	No. Tested	No. Pos.	Per Cent Positive	No. Tested	No. Pos.	Per Cent Positive	No. Tested	No. Pos.	Per Cent Positive	No. Tested	No. Pos.	Per Cent Positive	No. Tested	No. Pos.	Per Cent Positive
Patients tested		16	0	0	16	2	12.5	16	13	81.3	14	13	93	12	8	66.6	7	3	43	10	5	50	6	2	33.3
Blood specimens tested	W	18	0	0	33	1	3.3	50	22	44	53	33	62.2	39	16	41	23	9	39	22	9	41	23	4	17.4
	SK	29	0	0	69	1	1.5	96	21	25	77	23	32.5	56	7	12.5	38	9	23.7	33	8	24	27	1	3.7
Series 2																									
Patients tested		9	0	0	0	0	0	9	6	66.6	6	5	83.4	5	4	80	2	1	50	0	5	55.5	6	4	66.6
Blood specimens tested	W	27	0	0	23	0	0	24	6	17.6	24	11	45.8	15	5	33.3	5	0	0	44	5	11.4	57	5	8.8
	PK	22	0	0	25	0	0	24	13	58.2	24	17	71	15	10	66.6	5	1	20	44	17	38.7	57	20	35
	SK	14	0	0	23	0	0	35	10	28.5	24	11	46	15	5	33.3	5	0	0	44	9	20.4	55	6	10.5

* W = Wassermann, PK = Presumptive Kahn, SK = Standard Kahn.

per cent of all twenty-five infections, initial positive reactions were exhibited during the first two weeks of the paroxysmal stage.

Referring again to table 1, it is seen that there was considerable difference in the length of the interval between inoculation and the appearance of the first serologic reaction among the persons in the first series and less variation among those of the second series. Nevertheless the average duration of this "seronegative" period was twenty and 22.8 days, respectively, in the two groups. Seventy-two per cent of the positive reactions in the twenty-five persons experiencing attacks of malaria made their first appearance during the third and fourth weeks after inoculation. It is noticeable that our patients, having reached the "seropositive" state, marked by the appearance of the first positive test, showed a wide divergence in the duration of the interval from the first to the last positive serologic reaction. This period varied from eight to sixty-six days in duration, the average length being twenty-nine days. It was less than three weeks in 40 per cent of the attacks, more than three weeks in 60 per cent, more than four weeks in about half and more than five weeks in 32 per cent.

It may be remarked here that there was a considerable degree of irregularity in the serologic positivity among these infections during the "seropositive" period. In all, only fourteen persons showed consistently positive

during that time, in all, 320 positive and 307 negative reactions. These positive and negative reactions were considered in relation to the duration of clinical activity in the twenty-five cases, which was divided into that of twenty-eight days or less and that of more than twenty-eight days. In this way a four square table was constructed for each type of test. It was found that the positive results from the Wassermann test alone increased significantly (chi square, 9.9) with prolonged clinical activity.

In some instances the paroxysms terminated before the patient became seronegative, while in other instances the patients became seronegative before the termination of the paroxysms. These contradictory occurrences were divided about equally, although in a few cases the administration of quinine had apparently shortened the clinical course.

Table 3, which was prepared to supplement the data given in table 2, shows the total percentage of positive results obtained with each type of test during the different stages of the infection. The accompanying chart presents the same data in graphic form, combining the results obtained in the two groups. It is apparent that in both series the greatest proportion of positive reactions from each test occurred during the second two weeks of clinical activity. In the first series the second greatest proportion occurred during the first two weeks and in the second series during the third two weeks of

that stage of the infection. The increase in the percentage of positive reactions noted during the first two weeks following the active phase of the disease is no doubt due in part to the patients who did not exhibit positive serologic reactions until after the paroxysms ceased.

The chronologic relation of each positive serum reaction (all tests) to the nearest paroxysm has been determined and presented in table 5. Each serologic result was classified according to (1) the number of days by which it preceded the first paroxysm of the attack, (2) whether it occurred on the same day as a paroxysm or (3) the number of days by which it followed the immediately preceding paroxysm. The results of this classification were then divided into seven day intervals. The percentage of positive reactions for each group is recorded. It will be noted that during the week preceding the clinical onset the positive specimens formed only 5.1 per cent of those collected in that period, while in the case of the specimens obtained on the same day as a paroxysm the incidence of positive reactions rose to 35.5 per cent. During the days subsequent to

tions were exhibited by 20.4 per cent of all specimens secured from falciparum-infected patients.

It will also be noted in table 4 that the males contributed the greater proportion of positive Wassermann reactions during the attack but that the females exhibited relatively more positive Kahn reactions as well as total positive reactions. Following cessation of the attack, the males showed a greater percentage of positive Wassermann reactions and of total positive reactions. Of all specimens of serum secured from males, 227 per cent gave positive reactions whereas of those from females 28.7 gave positive reactions. It is apparent that the lower age group (those up to 35 years) consistently exhibited proportionately more positive results both during and after the attack. The same group showed 26.8 per cent positive reactions among the total tests on their serums, as against 18.3 per cent of positive reactions for the group whose ages exceeded 35.

All positive serologic reactions obtained with each of the three tests were considered in relation to the duration of the clinical attack of malaria. For this purpose the latter were divided into two groups, namely

TABLE 4.—Percentage of Positive Serologic Reactions by Stage of Infection in Relation to Plasmodial Species, Sex and Age of Patients

Class	No of Cases	Before Attack Type of Test*				During Attack Type of Test				After Attack Type of Test				Total: All Tests		
		W	PK	SK	All	W	PK	SK	All	W	PK	SK	All	No Tested	No Positive	Per Cent Positive
Vivax. . .	13	0	0	13	0.7	51.7	55.6	52.4	41.7	10.2	37.5	11	15.5	775	157	21.1
Falciparum . .	10	2.1	0	0	0.7	28.7	48.8	15.7	23.5	17	23.2	6.1	15.3	704	114	16.2
Male . . .	14	1.7	0	0	0.6	45.4	35	20.1	29.2	29.1	45.6	17	28	752	171	22.7
Female . . .	11	0	0	2.3	0.9	42.8	69	31.4	40.2	15.4	52.4	17.3	23.2	537	160	29.7
Up to 35 years .	20	1.2	0	0	0.4	47.6	51.9	22.9	38.3	24.5	47.4	19	27.7	1,069	286	26.8
Over 35 years .	5	0	0	5.3	1.9	34.4	0	19.1	25.3	18.2	0	0	7.7	240	44	18.3

* W = Wassermann, PK = Presumptive Kahn, SK = Standard Kahn

the last previous paroxysm this proportion continued to rise until a maximum of 52 per cent positive specimens were collected during the third week. After the third week the positive results fell rather rapidly to the low point of 8.3 per cent, observed during the sixth and seventh weeks.

The proportion of positive serologic reactions in these persons was studied for possible correlation with the species of plasmodium involved and the sex and age

TABLE 5.—Positive and Negative Serologic Results in Relation to Individual Paroxysms

Type of Result	Preceding: Weeks	Simultaneous with Paroxysms	Interval in Weeks Following Last Previous Paroxysm						
			1	2	3	4	5	6	7
Positive	2	162	65	35	27	8	3	1	1
Negative	37	295	98	46	25	24	16	11	11
Total	39	457	163	81	52	32	19	12	12
Per cent positive . .	5.1	35.5	39.8	43.2	51.9	25	15.8	8.3	8.3

of the patients; the results are shown in table 4. This revealed that during the attack the cases of vivax infections exhibited the greater percentage of positive reactions with the Wassermann and standard Kahn tests; but with the presumptive Kahn test the greater proportion of positive reactions was found in the falciparum cases. Following the malarial attack, the falciparum infections contributed the larger percentage of positive Wassermann reactions, whereas the positive reactions with the two Kahn tests were found in relatively greater numbers among the attacks due to P. vivax. Of all specimens obtained from persons with vivax infections, 28.1 per cent gave positive reactions, while such reac-

tions lasting twenty-eight days or less and those lasting more than twenty-eight days. It was found that only in the case of the Wassermann test did the incidence of positive reactions vary directly to a significant degree (chi square, 13) with the clinical duration of the attack.

The cerebrospinal fluid was examined in four cases during the active phase of the malarial attack. One of these (271-1126, on the fifteenth day of the disease) showed a strongly positive Wassermann reaction, a normal colloidal gold reaction and a leukocyte count of 28 per cubic millimeter. Prior to the induction of malarial therapy the serologic reaction of this patient's cerebrospinal fluid had been completely negative (5 leukocytes per cubic millimeter). Unfortunately a specimen was not obtained following recovery because of the patient's unexpectedly early parole from the institution.

In comparing the results obtained on the frozen duplicate serums simultaneously examined from patients 304 and 1147 with those on the unfrozen specimens currently examined, some differences were noted. In case 304 the unfrozen specimens showed positive presumptive Kahn reactions considerably longer than the frozen ones, but one of the latter provided the only positive Wassermann reaction obtained from that individual. The serum of the other patient (1147) yielded fewer positive presumptive Kahn reactions in the case of the frozen specimens, but otherwise the difference was not marked.

COMMENT

That malarial infections may influence, even profoundly, the reaction of the serologic tests for syphilis can scarcely be doubted. The systematic observations

on the Kalm and Wassermann tests as carried out on our series of nonsyphilitic patients showed that all in whom a clinical attack of malaria developed exhibited positive results at some time during the course of the infection. That such results ought to be attributed to coincident syphilis, as suggested by some authors, does not appear to be reasonable. The negative results obtained in our cases both prior and subsequent to the positive results, together with the absence of any clinical evidence of syphilis, would support our contention, and the range in sensitivity of the serologic reactions which obtained in this study appears to add weight to our positive results. It is realized that a positive reaction with the presumptive Kahn test does not necessarily mean the presence of a syphilitic infection; it is more sensitive than the standard test and serves as a check on the latter as well as to establish the absence of syphilis in the case of a negative result. Nevertheless it was felt that it would be of interest to include in this paper the results obtained with the presumptive test. One might have expected the Wassermann test as performed on specimens in series 2 to be more sensitive than as carried out in series 1. The results, however, did not indicate this.

In view of the results observed in the present study it seems quite probable that one factor contributing toward the conflicting results recorded in the literature may well be the stage of the infections at which the samples of serums were collected by various workers. Noteworthy in this connection is the irregularity in the time of appearance of the first positive serologic reaction observed in our cases and the interspersing of negative reactions among the positive.

It is possible that the maximum frequency of positive results noted during the third week following paroxysms (table 5) may have some significance with regard to the mechanism of falsely positive reactions. Similarly, the partial duplication of a paretic serologic reaction in a spinal fluid may have some significance in view of the therapeutic value of malaria in dementia paralytica. Our data do not offer any explanation of these obscure observations.

Perhaps the most important question brought out by these results is that of how much reliance to place on positive serologic reactions obtained in an endemically malarious area. In our opinion it is of greatest importance that malaria be ruled out before such positive results are accepted. Emphasis is lent to this by reason of the positive reactions observed for variable periods in a number of cases after the cessation of clinical activity. In all but one instance in which this occurred parasites were still detectable in the blood smears. In this one case an intercurrent nephritis had developed, and it cannot be determined from our data just how much influence this condition may have exerted even for some time after the termination of the malarial infection by means of quinine. It is not unlikely that a certain number of patients in malarious areas have been treated for syphilis on the basis of positive serologic reactions alone, when the latter were in fact due to malarial infection.

SUMMARY

A systematic study of the Wassermann and Kahn reactions was made before, during and after twenty-five naturally induced attacks of malaria in nonsyphilitic patients. Positive reactions were obtained in every case in which malaria developed clinically. Two cases

showed no positive results from the complement fixation tests and two others showed no positive Kahn reactions.

There was an instance of malaria provoking positive serologic reactions and a considerably increased cell count in the cerebrospinal fluid.

Seventy-two per cent of the positive reactions made their first appearance during the third and fourth weeks following inoculation. The first positive reactions were observed both before and after the period of clinical activity in a few instances, but in 68 per cent of the attacks they occurred within the first two weeks of the febrile period. The duration of the "seropositive" period exceeded three weeks in 60 per cent of the cases and extended beyond four weeks in 48 per cent. During this time 320 positive and 307 negative serologic reactions were obtained.

When the results from all tests were totaled, there was observed a tendency for vivax infections to induce a greater proportion of positive serologic results than falciparum infections. Likewise the relative number of positive reactions was higher among females with malaria than among males, and among persons up to 35 years of age than among those over that age.

The percentage of positive reactions was highest during the period from fifteen to twenty-one days after the last previous paroxysm.

COMPLEMENT AND ASCORBIC ACID IN HUMAN SCURVY

AN EXPERIMENTAL STUDY

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Ecker, Pillemer, Wertheimer and Gradis¹ showed that a correlation exists between the concentration of ascorbic acid in the blood serum of guinea pigs and the complementary activity of the serum. These authors further demonstrated that, in vivo, the relationship holds true until a definite level of ascorbic acid is reached at about 1 mg. per hundred cubic centimeters of serum. It was also found that serums treated in vitro with optimal quantities of ascorbic acid improved in their complementary powers and showed greater stability.

From these observations the suggestion was finally made that the complementing activity of the serums of scorbutic guinea pigs and of men may be used as a biologic index of vitamin C deficiency.

Since these studies have appeared, Chu and Chow² independently also noted that a qualitative relationship exists between vitamin C intake and complement titer in human plasma. The authors stated that an adequate explanation of the phenomenon is not clear at present.

Chu and Chow studied two groups of subjects. The first group consisted of two children and one woman.

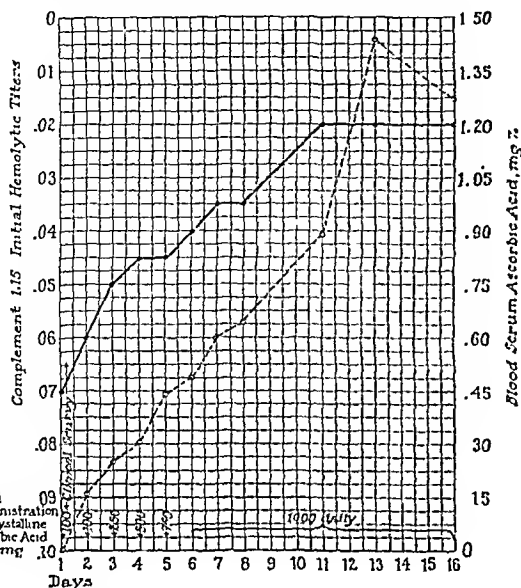
From the Institute of Pathology, Western Reserve University and University Hospitals, and Cleveland City Hospital.
1. Ecker, E. E.; Pillemer, L.; Wertheimer, D., and Gradis, H.: *J. Immunol.* 34: 19 (Jan.) 1938.
2. Chu, Fu-T'ang, and Chow, B. F.: *Proc. Soc. Exper. Biol. & Med.* 38: 674, 1938.

In this group simultaneous determinations of reduced vitamin C and complement were made over extended periods in which the vitamin C intake was raised or lowered by the addition of ascorbic acid to, or its withdrawal from, a constant basal diet. They noticed in all three cases that the use of ascorbic acid or of vege-

became so marked that she had no bowel movement without an enema. A year later a barium sulfate enema showed no abnormality of the colon, but even then the gums were dirty and of foul odor. Amenorrhea began a year later and continued until two months before admission. For the last seven months she had placed herself on a diet totally deficient in vegetables and fresh fruits. She noted that her gums were swollen and that they bled easily. One month before admission she noted a brownish vaginal discharge and red spots on her legs. About one week prior to her admission she had muscular soreness in the left thigh.

Examination.—The temperature was 37.4 C. (99.3 F.), pulse rate 100, respiratory rate 20 and blood pressure 102 systolic 80 diastolic. The patient was thin, pale, underdeveloped and poorly nourished. There were no abnormalities of the eyes, ears, nose or throat. Her breath was foul and her gums were swollen, hanging down over the molars like thick curtains. They were a deep purplish red and bled readily on pressure. The chest was clear and the heart was normal as to size and rhythm. No murmurs were heard. There was some tenderness over the fourth, fifth and sixth ribs on the left. The abdomen was normal, as were the rectal and pelvic areas, except for a small amount of blood-stained discharge from the vagina. On the anterior portion of the legs there were many small pinhead sized red lesions (macular), each of which appeared to be grouped about the hair follicles. The reflexes were normal. There was no evidence of subperiosteal hemorrhages.

Laboratory Results: Red blood cells numbered 3.85 million hemoglobin content 74 per cent; white blood cells 8,000; differential count was normal. Kline's exclusion test gave negative results. Blood urea nitrogen was 8.3 mg. per hundred cubic centimeters; nonprotein nitrogen 25.7 mg., creatinine 1



of crystalline ascorbic acid by mouth. The same dose was given on the second day. On the following four days she received respectively 250, 500, 750 and 1,000 mg. for a period of one week. Three days after the therapy was initiated the Rumpel-Leede test became negative. On the fifth day of the regimen her gums began to shrink and there was no bleeding on pressure. The vaginal discharge disappeared and the patient continued to improve.

During her hospital course the blood was examined daily. The ascorbic acid content of her serum was

TABLE 1.—*The Daily Reactivations of the Serum in Case 1**

Days	Comple- ment 1:15 in Ce.	1 Ce. of 1:10 Comple- ment plus Ascorbic Acid, Ce.	1 Ce. of 1:10 Comple- ment plus Gluta- thione SH, Ce.	1 Ce. of 1:10 Comple- ment plus Potassium Cyanide, Ce.	1 Ce. of 1:10 Comple- ment plus Hydrogen Sulfide, Ce.
1	0.07	0.03	0.01	0.03	0.035
2	0.06	0.03	0.01	0.04	0.04
3	0.05	0.03	0.01	0.04	0.04
4	0.045	0.03	0.01	0.04	0.04
5	0.045	0.03	0.01	0.04	0.04
6	0.04	0.02	0.03	0.03	0.03
7	0.035	0.03	0.03	0.03	0.03
8	0.015	0.03	0.04	0.01	0.03
9	0.02	0.025	0.025	0.025	0.025
10	0.02	0.02	0.02	0.03	0.04
11	0.02	0.025	0.03	0.03	0.03

* Solutions employed: 0.5 cc. of 0.002 normal solution of potassium cyanide in 7.2 buffer solution M/15; 0.5 cc. of hydrogen sulfide water (saturated) 20 per cent in buffer solution M/15; 0.15 mg. ascorbic acid in 0.5 cc. of 7.2 phosphate buffer M/15, and the same of glutathione SH.

immediately titrated with dichlor-phenolindophenol. At the same time the initial complement titer of the serum was estimated. On admission her initial complement titer was 0.07 cc. of a 1:15 dilution, a rather low figure. The strength of human complement is about one half of that of the guinea pig. The patient's weakened complement was also daily reactivated with ascorbic acid, glutathione SH, hydrogen sulfide and potassium cyanide. The method described by Ecker, Pillemer, Martiensen and Wertheimer³ was followed. It has been shown by these workers that the weakened complement obtained from scorbutic guinea pigs can be reactivated by various reductants, such as hydrogen sulfide, ascorbic acid and sodium hydrosulfite. Normal complement was also reversibly inactivated by a variety of oxidizing agents, provided the inactivation was strictly controlled. The oxidizing agents employed were iodine, hydrogen peroxide, quinone and oxygen. The same also held true for cuprous oxide and phenylmercuric chloride. Complement inactivated by these agents was regenerated by the various reductants mentioned and by heat-inactivated complement and by complement lacking the third or the fourth component.

Chart 1 shows the results obtained following the gradual administration of crystalline ascorbic acid.

The curves clearly demonstrate the parallel rise of ascorbic acid and of complement. This rise continued until a concentration of about 1 mg. of ascorbic acid per hundred cubic centimeters of serum was reached. At this point the complement titer reached its maximum, while the concentration of ascorbic acid increased to a maximum of 1.44 mg. per hundred cubic centimeters. This finding corresponds to the phenomenon observed by Ecker and his associates in the case of the guinea pig.

Table 1 shows the figures obtained after the daily reactivations.

3. Ecker, E. E.; Pillemer, L.; Martiensen, E. W., and Wertheimer, D.: J. Biol. Chem. 123: 351 (March) 1938.

This table shows conclusively that the weakened complement can be reactivated and that ascorbic acid showed the best reactivating qualities. However, glutathione SH, potassium cyanide and hydrogen sulfide all brought about reactivations. As the titer of the complement improved under the treatment with ascorbic acid, the reactivations became less marked until no further reactivation was possible.

These observations clearly indicate that the complement of the guinea pig and of man is controlled by oxidation and reduction and that the complement in cases of vitamin C deficiency occurs in a greatly oxidized state.

CASE 2.—*History*.—J. G., a man aged 59, a Hungarian, was well until July 5, 1938, one week before admission to the City Hospital, at which time he noticed swelling and bluish discoloration of his feet, ankles and legs. His diet had consisted chiefly of black coffee and cookies and an occasional "hamburger" during the past four months. The patient suffered from muscular tenderness and found walking painful.

Examination.—Physical examination showed emaciation, dryness of the skin and ill defined, confluent patches of subcutaneous hemorrhages over the dorsum of both feet, legs and lower thighs (posteriorly). Numerous perifollicular hemorrhages were observed on the lower part of the thighs and legs. There was definite tenderness of the muscles and tendons. About the nine carious teeth the gums appeared to be spongy and bled readily. No pus appeared about the margins of the gums. The patient did not complain of tenderness of the bones and joints. The Rumpel-Leede test gave a negative reaction, as well as the cupping test.

Laboratory Results: Bleeding time was 1.5 minutes and clotting time 6 minutes. Clot retraction occurred in thirteen hours. There was increased fragility of the erythrocytes. Red blood cells numbered 3.2 millions and the white blood cell count was normal. Examination of the urine was negative for blood but the stools gave a positive reaction.

Course.—The patient was placed on a vitamin C deficient diet and after two control bleedings were made he was given crystalline vitamin C by mouth. The doses given were the same as in the first case. The patient was bled daily and his serum ascorbic acid content and complement titer were determined. On July 19 his general condition was definitely

TABLE 2.—*The Daily Reactivations of the Serums in Case 2**

Days	Comple- ment 1:15 in Ce.	1 Ce. Comple- ment plus Ascorbic Acid, Ce.	1 Ce. Comple- ment plus Gluta- thione SH, Ce.	1 Ce. Comple- ment plus Potassium Cyanide, Ce.	1 Ce. Comple- ment plus Hydrogen Sulfide, Ce.
1	0.08	0.06	0.05	0.06	0.06
2	0.07	0.05	0.05	0.06	0.06
3	0.06	0.04	0.04	0.05	0.05
4	0.06	0.04	0.04	0.04	0.04
5	0.04	0.03	0.03	0.03	0.01
6	0.03	0.02	0.03	0.03	0.03
7	0.02	0.02	0.025	0.03	0.03
8	0.02	0.02	0.025	0.03	0.03

* The amounts of the reductants, etc., were given in the first table.

improved. July 21 he showed no muscular tenderness and his gait was practically normal. July 26 the hemorrhages on his lower extremities showed great improvement. The gums were still edematous but less red and bled only after considerable manipulation. The patient continued to improve.

The parallelism between his serum ascorbic acid content and complementary titers is given on chart 2. His initial complement titer on admission was 0.08 cc. of a 1:15 serum dilution and his ascorbic acid content about 0.06 mg. per hundred cubic centimeters. Following the oral administration of the vitamin a gradual rise of both factors occurred. When the ascorbic acid content reached a concentration of about 1 mg. per

hundred cubic centimeters of serum the initial complement titer reached its maximum at about 0.02 cc. of a 1:15 serum dilution. A further increase of the ascorbic acid content to 1.9 mg. per hundred cubic centimeters of serum did not increase the complementing power.

The curves in both cases are fundamentally identical except that in the second case the curves are steeper, indicating a more rapid response to the treatment.

Again, the serums secured from the daily bleedings were reactivated by the reductants already mentioned (table 2).

Ascorbic acid and glutathione SH showed the most marked reactivating effects.

COMMENT

These two cases conclusively demonstrate the relationship between complementary activity and the ascorbic acid content of the serums of scorbutic persons during the course of treatments.

Since the complementary activity can be carefully determined, it is proposed that this factor be studied in all cases of suspected vitamin C deficiencies, including the infections.

A low complementary titer will probably lower the general immunity of the patient. Experimentally, Moore⁴ has shown this to be the case in a strain of complement-deficient guinea pigs. These animals were more highly susceptible to infections than comparable animals with a normal complement titer.

In the case of vitamin C deficiency, complementary activity has been conclusively shown to be important. Complement titration, therefore, becomes of value in all cases of clinical or subclinical scurvy and will also indicate the point of saturation in the course of treatments. According to Wright and Lilienfeld,⁵ Harris and Ray⁶ and Archer and Graham,⁷ subclinical scurvy is very common. In a recent report Sloan⁸ stated that the assay of a single sample of urine is a rough and frequently false measure of vitamin saturation. The Rumpel-Leede test is also not too reliable. This test was negative in the second case described in this paper. So far, the most dependable method is the determination of the rate of absorption of a dose of the vitamin injected into the blood stream. The determination of the complementary activity of the blood furnishes a biologic index of the amount of ascorbic acid present. It may well replace the quantitative chemical estimation of the ascorbic acid in those instances in which both methods cannot be utilized.

SUMMARY

Two patients with typical human scurvy were kept on a vitamin C free diet and treated orally with graded doses of crystalline vitamin C. The initial complement titers as well as the ascorbic acid content of the blood serums of the patients were determined daily. The original complement titers were very low, namely 0.07 and 0.08 cc. of a 1:15 serum dilution. The ascorbic acid contents of the serums were practically nontitrable. After the daily oral administration of crystalline vitamin C in graded doses the curves of vitamin C concentrations and complementary titers ran a practically parallel course until the weakened complement was

completely restored by the ascorbic acid at a concentration of a little over 1 mg. per hundred cubic centimeters of serum. Additional doses of the ascorbic acid failed to raise the final initial complement titers, namely 0.02 cc. of a 1:15 serum dilution.

These observations conclusively confirm the original observations made by Ecker, Pillemer, Wertheimer and Gradis¹ in the guinea pig and the later observations of Chu and Chow² in man.

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END RESULT OF A TUBERCULOSIS CASE FINDING PROJECT

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To call this paper or any other paper the end result of a case finding project is really a mistake. The nature of the disease tuberculosis is such that no end result can be determined within the space of five, ten or even fifteen years. Hence our presentation, which is a three to five year follow-up, can hardly be termed an end result. There are, however, certain important facts that have been determined by this work and these we wish to present.

Prior to the advent of the x-ray and tuberculin test, physicians depended on contact history, subjective symptoms and physical examination for the diagnosis of tuberculosis. The objection to these methods was that the cases uncovered were almost invariably in an advanced stage and treatment was either prolonged or unsuccessful. With the perfection of the x-rays, suspected cases could be checked. This led to earlier diagnosis but it was still not conducive to group work. With the tuberculin test and increased knowledge of tuberculosis, physicians turned to group testing. The true purpose of this work is to discover disease in the incipient stage, when treatment is more successful.

In any case finding project, one can determine (using two or three tests) almost 100 per cent of those infected with tuberculosis. Large scale testing can be done at a relatively low cost. The positive reactors could be roentgenographed and tuberculous disease determined long before the patient shows subjective signs.

Lay education has progressed apace. Each year larger numbers accept these examinations. People are more and more beginning to understand the "apparent outward" significance of a positive reaction and the value of early diagnosis.

There is no question that these improved methods of case finding and progressing education have lowered the infection rate in tuberculosis and certainly the death rate has shown a steady drop. However, in our zeal to uncover new cases of this disease is it possible we have neglected those already discovered? This question is born of an investigation conducted by the Tuberculosis Institute of Chicago and Cook County.

From 1933 to 1936 we discovered some sixty-five cases of tuberculosis in the high school students of Chicago and its suburbs. Forty-five of these were diagnosed either suspected or incipient disease, nineteen as moderately advanced and one as far advanced. Each case

4. Moore, H. D.: *J. Immunol.* 4: 425 (Nov.) 1919.

5. Wright, T. S., and Lilienfeld, Alfred: *Pharmacologic and Therapeutic Properties of Crystalline Vitamin C (Cevitamic Acid)*, *Arch. Int. Med.* 57: 241 (Feb.) 1936.

6. Harris, L. J., and Ray, S. N.: *Lancet* 1: 71 (Jan. 12) 1935.

7. Archer, H. E., and Graham, George: *Lancet* 1: 710 (March 28) 1936.

8. Sloan, R. A.: *J. Lab. & Clin. Med.* 23: 1015 (July) 1938.

was reported and referred for treatment. Late in 1937 and early in 1938 a follow-up study was conducted to learn the status of these individuals. To say that the results were disappointing would be a gross understatement. They were astonishing. It was difficult to believe that for all our success in early diagnosis, improved methods and facilities for treatment, and progressive education the death rate and morbidity were so high, our control of these cases so poor, and the number of deaths greater in the incipient than in the advanced group.

Of the sixty-five patients seven had died (10.85 per cent) within three to five years. What is so paradoxically striking is that of the twenty patients with advanced tuberculosis one (5 per cent) has died, while of the forty-five patients in an early stage six (13.33 per cent) have died. Further, the remaining nineteen patients with advanced tuberculosis are holding their own but of the incipient group eight are now in an advanced stage, a total mortality or morbidity increase of fourteen cases, almost 33 per cent (table 1).

In the search for the reason for these disproportionate observations let us consider table 2.

Let us analyze these figures. Of the forty-five patients with the disease in the incipient stage twenty-two (49.11 per cent) had active treatment. The other twenty-three were put under observation. In the twenty advanced cases active treatment was given in nineteen (95 per cent). In the type of treatment it will be noted that in the incipient group the largest percentage of the twenty-two actively treated fall into the bed rest class, twelve or 54.54 per cent, and seven (31.81 per cent) into the pneumothorax class, while only three (13.63 per cent) had both. In the advanced group almost the opposite is noted; eight (42.10 per cent) fall into the class who had both bed rest and pneumothorax, six (31.57 per cent) had pneumothorax alone and four 21.05 per cent) had only bed rest. Complete bed rest was employed in the one phrenic case. We are not presenting these figures as an index of the relative values of different treatment but merely to show the more active measures used in the advanced cases.

Let us review briefly the seven deaths. One was a case diagnosed far advanced tuberculosis. Of the six in the incipient group one patient was in the pneu-

results are peculiar to this region. We feel that a thorough follow-up of tuberculosis observation cases in any group would disclose similar results. At the St. Louis meeting of the Mississippi Valley Conference in 1938 Dr. Chadwick in a striking paper showed that over a ten year period of follow-up in Massachusetts the death rate from these early cases in school children was up to 73 per cent. These figures demonstrate quite well the inadequacy of treatment and follow-up.

For all this we, the physicians, must accept the blame, for if the patient is negligent it is because we have failed to teach and impress him. What usually obtains

TABLE 2.—Treatment

	Number	Active Treatment	Type of Treatment	Discontinued Observation
Advanced tuberculosis	20	19 (95%)	Bed rest..... 4 (21.05%) Pneumothorax 6 (31.57%) Both..... 8 (42.10%) Phrenic..... 1	0
Incipient tuberculosis	45	22 (49.11%)	Bed rest..... 12 (54.54%) Pneumothorax 7 (31.81%) Both..... 3 (13.63%)	12
		Observation 23		

is as follows (table 2): In the twenty-two incipient cases actively treated the results are good, as in the advanced cases actively treated. Most of our grief comes from the observation group. It would seem then that the latter group should be abolished. This would no doubt solve our problem. This, however, is often impossible. The story of those in this observation class is usually as follows:

A patient outwardly in good health and oftentimes obese will be found to have a suggestive or minimal lesion. Attempts at confining such a person to bed or using pneumothorax are often rebelled against. His knowledge of tuberculosis is at best rudimentary. His appetite is good, he has lost no weight, he is not tired, he has no cough and no fever. Suddenly he is told by a physician that he has tuberculosis or a suspicious case of tuberculosis. He is advised bed rest but refuses to submit. In this he is often unwittingly aided by his physician. The doctor, well meaning but not versed in tuberculosis, failed to read a minimal lesion into the x-ray examination. So as a compromise the patient is advised to lead a normal life, avoid fatigue, take a high caloric, high vitamin diet, and avail himself of fresh air and sunshine and return for observation. Let us say he does this; he is seen every month or two by the tuberculosis clinic, where he is not given any additional treatment or advice but told to keep coming back. Soon he falls into disbelief and fails to return and resumes a strenuous life. The next time he is seen he may have an advanced case.

Also the tendency is to minimize the observations. This is done because we do not wish to frighten the patient and because often we, as physicians, cannot reconcile tuberculosis to a minimal, seeming harmless lesion on the roentgenogram in a robust physical specimen. Again, two seemingly identical patients may be treated alike, both put on observation and controlled work, and one will get along well while the other breaks down. There is no method of determining which of these lesions will progress to far advanced tuberculosis.

The answer lies probably in active treatment more frequently and in closer surveillance of the observa-

TABLE 1.—Mortality

	Number	Deaths	Increased Involvement
Incipient tuberculosis.....	45	6 (13.33%)	8 (17.77%)
Advanced tuberculosis.....	20	1 (5%)	0

mothorax class but was very irregular in attendance. The other five were in the observation group. Of the eight cases which had increased disease in the incipient group, all were in the observation class.

It would seem then that the chief reasons for the discrepancy in our results was either lack of active treatment for the early cases, inadequate observation or both.

A review of the literature was disappointing. While there were many follow-ups on positive reactors which disclosed numerous cases of tuberculosis and numerous articles showing results of various types of treatment and occasional reports on rechecks of arrested cases, no reports such as ours could be found. For some time we have wondered whether these poor

tion cases so any tendency to increased involvement may be noted and treated with active measures.

There is yet another group of patients who are being neglected. This group is made up of patients who have a positive tuberculin test with a negative chest roentgenogram. The tendency is to say that they are healthy and that no special care is needed.

In our work we have many such cases; just recently we have had two fatalities in this group. Both of these students had a positive tuberculin reaction and were diagnosed as having healthy chests. They were dead of tuberculosis within two and one-half years.

Not only must the medical profession continue its progress in this disease against known cases but must extend its efforts to include routine roentgenograms of all positive reactors and annual retesting for all negative reactors. Then and only then shall we be completely successful in our campaign against tuberculosis.

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A CEREBELLAR SIGN

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The pendular movement of the arm in walking is frequently found to be reduced or absent in patients with pyramidal or extrapyramidal disease. My purpose in this article is to point out that unilateral decrease or cessation of the arm-swinging movement in walking may be due also to disease of the cerebellum. This finding may constitute a fine and early sign of the involvement of the homolateral cerebellar hemisphere. When in 1930 I reported this clinical observation to my former teacher, the late Dr. Kinnier Wilson, he said that he considered it of great interest and worthy of further study. In the same year I read a short paper¹ on this cerebellar sign at the Congress of the German Neurologists in Dresden. In an article in 1931 Mann² concluded from his own experience that this sign deserves "marked attention." Marburg³ referred to my first observation as extremely interesting and as standing alone in the literature and stated in his monograph on the cerebellum⁴ that these changes of the swinging movement of the arm in walking "appear to be an extraordinarily important sign of an affection of the lateral lobes of the cerebellum." Bing⁵ gave the same opinion.

These comments, together with later confirmatory observations, warrant a short review of the subject.

My attention was drawn to this sign during observation, some years ago, of a girl aged 12 who complained of headache and vomiting of three months' duration. Examination showed the following signs: pressure pulse; choked disks; nystagmus, of larger amplitude to the right, a very slight adiadokokinesis of the right hand, a fine intention tremor of the right arm and a slight uncertainty in walking in the position of a rope dancer, with a tendency to deviate

more to the right. However, the most striking sign the patient presented was a complete loss of the pendular movement of the right arm in walking. The arm, hanging down, was completely flaccid. This was still more conspicuous because this arm did not show any pyramidal or extrapyramidal sign and only slight cerebellar signs. It was remarkable that the patient was not particularly handicapped in the use of her right hand and arm. The clinical diagnosis was: "tumor of the posterior fossa, in all probability within the right cerebellar hemisphere and more likely in the upper than in the lower part." At the operation performed by Dr. Sauerbruch in Berlin a sharply defined tumor (a fibrosarcoma the size of a hazelnut) was removed from the middle of the right cerebellar hemisphere.

Four months afterward the child had no complaints. The disks were not choked but there were slight nystagmus, questionable adiadokokinesis of the right hand and a trace of intention tremor of the right arm. The pendular movements of the right arm in walking had become normal.

The condition had progressed thus far at the time of my first communication in 1930. Annual examinations were made during the following three years and the results remained the same. In the fourth year the child complained of dizziness and double vision. Neurologic and ophthalmic examinations did not reveal any new sign except that the pendular movements of the right arm had again become distinctly diminished. A month later the patient was admitted to the surgical clinic of Dr. Sauerbruch in Berlin complaining of dizziness, double vision and strabismus. The clinic reported to me that the patient had palsy of the right rectus lateralis and rectus superior muscles and nystagmus to the right. A diagnosis was made of cyst or recurrence of tumor. Incision was made over the formerly treated area; a cyst in the right cerebellar hemisphere was punctured, and under this cyst a solid tumor the size of a hen's egg was found and extirpated. One branch of the tumor extended into the depths as far as the worm and projected into the fourth ventricle. When discharged from the clinic, the patient had fully recovered.

These operations had to some extent the value of a crucial experiment on the problem of the influence of the cerebellum on the swinging movement of the arm in walking. First, after removal of a tumor from the right cerebellar hemisphere the lost pendular movement of the right arm reappeared. Second, the renewed loss of the pendular movement of the homolateral arm was the first sign that indicated recurrence of the lesion.

Because of the observations made in this case, swinging of the arm in walking was studied in other cases of cerebellar disease. This movement was found to be definitely decreased or even lost in unilateral cerebellar diseases, such as tumor of the cerebellum or of the cerebellopontile angle, and in other conditions difficult to classify involving one cerebellar hemisphere. Particularly remarkable among the cases observed was one in which⁶ the syndrome indicated the presence of a tumor on the lower surface of the right cerebellar hemisphere. In this instance the pendular movement in walking was markedly reduced on the right side. After large doses of iodine had been given and roentgen

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1. Wartenberg, Robert: Ein Kleinhirnsymptom, *Deutsche Ztschr. f. Nervenh.* 116:145, 1930.

2. Mann, L.: Ueber ein häufig zu beobachtendes Syndrom bei Comotio bzw. Contusio cerebri, *Deutsche med. Wchnschr.* 2:2172 (Dec. 25) 1931.

3. Marburg, O.: Personal communication to the author.

4. Marburg, O., in Bumke, Oswald, and Foerster, Otfried: *Handbuch der Neurologie*, Berlin, Julius Springer, 1936, vol. 5, p. 565.

5. Bing, Robert: *Lehrbuch der Nervenkrankheiten*, ed. 5, Berlin, Urban & Schwarzenberg, 1937.

6. This case was described in a doctor's thesis by a pupil of mine (Lumburg, H.): *Ueber Rückbildung von Hirntumorsymptomen*, Freiburg i. B., 1935.

treatment had been applied, all the signs of the tumor subsided markedly and the pendular movement of the right arm became nearly normal. The condition may have been arachnoiditis scrota cystica of the posterior fossa. In most cases of unilateral acoustic tumor with cerebellar involvement the loss of the arm-swinging movement on the homolateral side was found to be complete; this sign appeared early and constituted a conspicuous part of the clinical picture. At the beginning of involvement of the cerebellum during the development of a tumor at the cerebellopontile angle, sometimes only two signs of this involvement were detectable. These were a slight deviation to the affected side in walking and decrease of pendular movement of the arm on the same side.

In two cases of olivopontocerebellar atrophy a diminution of the arm-swinging movement was found, more pronounced on the predominantly affected side. In some neurologic cases difficult to diagnose, special attention to this sign was helpful and led finally to the correct diagnosis.

A remarkable syndrome was found in cases of injury to the brain that affected chiefly one side of the posterior fossa. This consisted of the following unilateral signs: (1) palsy or weakness of the conjugate movement of the eyes in one direction, (2) loss of the vestibular reactions on the side affected, and (3) loss or decrease of pendular movement of the arm on the same side. A similar syndrome has been described by Mann.² He found in cases of concussion and of contusion of the brain the following signs, all of which appeared unilaterally on the side affected: (1) impairment of movement of the eye to one side; (2) a positive Romberg sign; (3) past pointing in Bárány's test; (4) loss of the swinging movement of the arm in walking (called by Mann the "Wartenberg sign") and (5) diminution of the corneal reflex. The unilateral loss of the pendular movement of the arm was in these cases part of a syndrome which pointed definitely to a unilateral disease of the posterior fossa. Mann assumed that this syndrome indicated a unilateral traumatic involvement of the corpus restiforme or neighboring structures.

In cerebellar disease, chiefly disturbance of synergy in the legs is seen, because, generally speaking, in man the arms are subject in a lesser degree to the coordinating influence of the cerebellum than are the legs. In the cases just described a disturbance of synergy in an arm resulted in a loss or decrease of its pendular movement in walking, and in our cases this sign has been found in combination with other signs and symptoms that point definitely to disorders of the cerebellum or at least of the posterior fossa.

My justification for relating this disorder of the pendular movement of the arm to involvement of the cerebellum lies in the fact that this sign was found in strictly unilateral injuries of the cerebellum. In 1918 Thomas⁷ described the gait of two of his patients (Ghi. and Hy) who had unilateral injuries of the cerebellum, stating that in the first week of their stay in the hospital the arm on the affected side swung in walking, but "later on the arm appeared to become immobilized intentionally and constantly in the same position, as if to avoid swinging." In another work⁸ the same author, describing signs of impairment of

function of the cerebellum, wrote "The upper extremity swings or else it is held motionless and no longer accompanies the movements of the lower extremity." In describing the clinical signs of unilateral cerebellar injury, Holmes⁹ stated: "Another example of asynergia is furnished by the fact as the patient walks the affected arm hangs inertly by his side and does not swing synchronously with the movements of the opposite leg." In his Croonian lectures on the clinical symptoms of cerebellar disease,¹⁰ the same author described the gait of a patient with a unilateral cerebellar lesion as follows: "In walking, the homolateral arm usually hangs inertly by his side and is not swung actively forward as he advances the opposite foot; sometimes, however, it is held against the thorax or abducted from it with the elbow partially flexed." Babonneix and Sigwald¹¹ noted the loss of pendular movement of one arm in a case of cerebellar tumor, and Folly¹² reported the same finding in a case of meningeal hemorrhage over one cerebellar hemisphere. Dusser de Barenne¹³ mentioned that in cerebellar lesions "the normal pendular movement of the arm as a movement coordinated with the heterolateral leg is disturbed." Henner¹⁴ said the same thing. Marburg,⁴ who observed this phenomenon years ago, mentioned in his monograph on the cerebellum a case of strictly unilateral involvement of the cerebellum in which the pendular movements of the arm were absent on the affected side.

In the light of my own experience and from data gathered from the literature, there is little doubt that the unilateral decrease or loss of the pendular movement of the arm constitutes a sign which can be produced by a lesion of the cerebellar hemisphere. However, it should be pointed out that, aside from the references I have cited, there is little mention of this subject in the literature. Alteration of the pendular movement of the arm in unilateral cerebellar disease is mentioned in hardly any textbook of neurology in English, German or French. Numerous personal communications indicate that this sign is but little known. It is not, for example, even referred to in the Proceedings of the Association for Research in Nervous and Mental Diseases of 1926 devoted to discussion of the cerebellum, in the report of the Symposium on the Cerebellum held at the combined meeting of the Section of Neurology of the Royal Society of Medicine and the American Neurological Association in London in 1927 or in the review of cerebellar symptoms and signs by Mills and Weisenburg.¹⁵ It is not mentioned in Cushing's monograph on "Tumors of the Nervus Acusticus,"¹⁶ a disease in which I have found this sign pronounced and of diagnostic importance.

From the physiologic standpoint this disturbance of the normal swinging movement of the arm in walking in a disease of the cerebellar hemisphere is easily understandable. The fundamental sign of a cerebellar lesion is asynergia, which has been defined by Babinski as "the inability to accomplish simultaneously the various

9. Holmes, Gordon: The Symptoms of Acute Cerebellar Injuries Due to Gunshot Injuries, *Brain* 40:461 (Dec.) 1917.

10. Holmes, Gordon: Croonian Lectures on the Clinical Symptoms of Cerebellar Disease, *Lancet* 2:59 (July 8) 1922.

11. Babonneix, L., and Sigwald, J.: Tumeur du cervelet, *Rev. neurol.* 1:76 (Jan.) 1930.

12. Folly, E.: Hémisindrome cérébelleux droit d'origine traumatique, *Rev. neurol.* 1:1155 (June) 1930.

13. Dusser de Barenne, J. G.: *Handbuch der Neurologie des Ohres* 1:646.

14. Henner, in Bericht über den I. Internationalen Neurologen Kongress, Bern, 1931, p. 332.

15. Mills, C. K., and Weisenburg, T. H.: Cerebellar Symptoms and Cerebellar Localization, *J. A. M. A.* 63:1813 (Nov. 21) 1914.

16. Cushing, Harvey: *Tumors of the Nervus Acusticus*, Philadelphia, W. B. Saunders Company, 1917.

7. Thomas, André: *Etudes sur les blessures du cervelet*, Paris, Vigot Frères, 1918, p. 83.

8. Thomas, André: *Pathologie du cervelet*, Roger-Widal-Teissier Nouveau traité de médecine, Paris, Masson & Cie, 1925, vol. 19, p. 807.

movements that constitute an act." The normal coordination of the various contracting muscles is disturbed. This may be noted, for instance, in the dissociation of the ordinarily synergic movements of finger and wrist and in the failure of synchronism in the movements of the head and eyes in looking toward one side. The loss of synergic movement in walking—i. e. the simultaneous bringing forward of one arm and the contralateral leg—belongs in the same group of disturbances. Here the synergic movement of the trunk with that of the muscles of the extremity is disturbed.

Thus it is certainly justifiable from both a clinical and a physiologic standpoint to attribute the unilateral reduction or cessation of pendular movement of the arm in walking to an involvement of the homolateral cerebellar hemisphere.

This sign may be produced by extrapyramidal and pyramidal disease, but it is my object in this article simply to point out that it may also be a sign of exclusively cerebellar disease. It is my definite impression that a cerebellar disease influences the pendular movement earlier and more pronouncedly than does a cerebral disorder.

The clinical importance of this sign lies in the fact that it is easily detectable, can hardly be simulated and constitutes an early sign of cerebellar involvement, as is shown especially in the first case described in this paper. In 1930 Holmes¹⁷ stated "Only today I saw what I believe is an early tumour of the right side of the cerebellum, and in this case the only signs were a little nystagmus to the right and absence of the normal swinging movements in the right arm."

The whole problem of the clinical significance of the pendular movement of the arm deserves more attention and study. It raises intricate problems which still await solution. I have observed a few cases with signs of increased intracranial pressure, in which no explanation could be found for the unilateral loss of swinging movement of the arm in walking. Also puzzling was a case reported by Fischer and Pözl¹⁸ in which resection of one cerebellar hemisphere had been followed by return of the pendular movements to normal. Concerning the question of exact localization of this sign, it may be of interest that in a case of tumor of the cerebellar worm, verified post mortem, the swinging movement of both arms had been normal. This has also been true in cases of multiple sclerosis with marked cerebellar gait.

In the light of knowledge of the relation of the cerebrum to the cerebellum, and especially in view of recent experiments by Aring and Fulton,¹⁹ it would be of interest to study the swinging movement of the arm in unilateral frontal disease.

17. Holmes, Gordon: Personal communication to the author.

18. Fischer, M. H., and Pözl, O.: Physiologische Untersuchungen nach Resektion der rechten Kleinhirnhemisphäre am Menschen, *Ztschr. f. d. ges. Neurol. u. Psychiat.* 119:163 (March 20) 1929.

19. Aring, C. D., and Fulton, J. F.: Relation of Cerebrum to Cerebellum, *Arch. Neurol. & Psychiat.* 35:439 (March) 1936.

Fertility.—Among all those producing children in the United States in 1934 there were forty-four women past their forty-seventh birthday, and therefore practically at the end of their fecund life, who brought forth in that year their first and only live births. In the same year there were two women of an extremely different order of proven breeding capacity. Each one of them, apparently quite in her stride, produced her twenty-seventh child.—Pearl, Raymond: *The Natural History of Population*, New York, Oxford University Press, 1939.

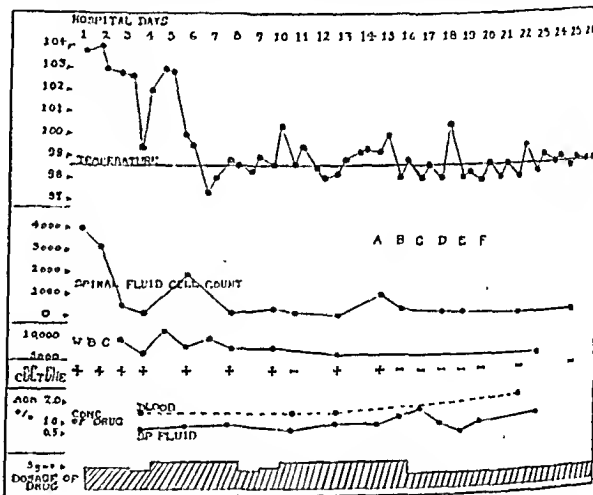
Clinical Notes, Suggestions and New Instruments

PNEUMOCOCCIC MENINGITIS SUCCESSFULLY TREATED WITH SULFAPYRIDINE

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Two reports¹ of the successful treatment of pneumococcal meningitis with 2-(*p*-aminobenzenesulfonamido) pyridine (sulfapyridine) have recently appeared from England. In view of the rarity of recovery from this disease and the apparent effectiveness of this new drug² in the condition, the following case is presented:

B. A., a white girl aged 14 years, admitted to the Charles V. Chapin Hospital Nov. 16, 1938, had had a nonproductive cough for two weeks but did not feel sick until three days before admission. At this time headache, projectile vomiting, increasing restlessness and a rise in temperature suddenly developed. She was delirious on admission. The temperature was 103.6 F., the pulse 104, the respiratory rate 26. The blood pressure was 98 systolic, 62 diastolic. Her neck was stiff and the Kernig sign



Course of treatment in the case of pneumococcal meningitis here presented. A indicates the intraspinal injection of 10 cc. of complement; B, 6 cc. of complement and 6 cc. of type XX rabbit serum; C, 5 cc. of type XX rabbit serum; D, 10 cc. of complement and 10 cc. of type XX rabbit serum; E, 9 cc. of complement and 9 cc. of type XX rabbit serum; F, 6 cc. of complement and 6 cc. of type XX rabbit serum.

was present. Physical examination showed no other abnormalities. In particular the lungs were clear, and no origin of the infection was found in the ears, nose or throat. A lumbar puncture revealed cloudy fluid, under increased pressure, which on culture yielded pneumococcus type XX. Two blood cultures yielded negative results.

The day after admission the oral administration of the drug was begun. The daily dose was approximately that recommended by Evans and Gaisford.³ The clinical improvement, as shown in the accompanying chart, was prompt and striking. One week after admission her temperature had returned to normal, the spinal fluid had cleared markedly and she was alert and asymptomatic. Cultures of the spinal fluid, however, continued to yield positive results, so intraspinal treatment with complement (from the patient's own serum) and specific anti-pneumococcus rabbit serum was begun on the fifteenth hospital day. Following this the cultures became negative and remained

From the Charles V. Chapin Hospital.

The drug used in this case was supplied by Merck & Co., Rahway, N. J., under the trade name of "Dagcan." The type XX antipneumococcus rabbit serum was supplied by Lederle, New York.

1. Reid, G. C. K., and Dyke, S. C.: Pneumococcal Meningitis, *Lancet* 2:619 (Sept. 10) 1938. Robertson, K.: Case of Pneumococcal Meningitis Treated with M & B 693, *Lancet* 2:728 (Sept. 24) 1938.

2. Whitby, Lionel: Chemotherapy of Bacterial Infections, *Lancet* 2:1095 (Nov. 12) 1938.

3. Evans, G. M., and Gaisford, W. F.: Treatment of Pneumonia with 2-(*p*-Aminobenzenesulfonamido) Pyridine, *Lancet* 2:14 (July 2) 1938.

so. The patient was discharged well six weeks after admission and ten days after all treatment was discontinued.

No toxic symptoms of any importance were noted that could be ascribed to the drug. There was some headache and nausea early in the treatment, but these may well have been due to the infection. The carbon dioxide combining power of the blood remained normal and there was only a slight drop in the hemoglobin content to 79 per cent. Sugar determinations of the spinal fluid showed a lowering to 28 mg. per hundred cubic centimeters and a return toward normal that lagged somewhat behind the other laboratory observations.

The concentrations of the drug as shown on the chart seem remarkably low, never exceeding 2.2 mg. per hundred cubic centimeters in the blood and 1.7 mg. in the spinal fluid. This can be only partly explained by the method used, that of Schmidt,⁴ which, as shown by parallel determinations by us, gives results for this drug about 25 per cent lower than that of Marshall.⁵

Capsular degeneration of pneumococci and their failure to type after exposure to this drug was first mentioned by Whitby.⁶ In this case capsule stains were inconclusive, but the organisms showed capsular swelling in specific typing serums as long as they were obtained from the spinal fluid. No significant change in their high virulence for mice was noted during the course of treatment. At no time were agglutinins for this organism present in the patient's serum.

Apparently in this case drug therapy, while producing marked clinical improvement, was not alone effective in eradicating the meningelial infection. The final cure was brought about by a combination of drug and serum therapy.

203 Thayer Street.

DERMATITIS FROM ORTHODICHLOROBENZENE

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Orthodichlorobenzene has become industrially important in the past few years. In addition to its other uses it serves as an effective solvent in lacquers, varnishes and waxes. It is used extensively for the preservation of wood because of its destructive effect on termites. Orthochlorophenol is also used as a wood preserver.

Orthodichlorobenzene consists of benzene with two of its hydrogen atoms replaced by chlorine; the prefix "ortho" means that the two chlorine atoms are on adjacent carbon atoms. Orthochlorophenol consists of phenol in which the hydrogen atom on one of the carbon atoms has been replaced by chlorine.

The toxicity of these materials will bear observation. Little is known of the chlorobenzenes or chlorophenols, but of the chloronaphthalenes, which are related products, some are apparently nontoxic to the liver when inhaled while those that are toxic when inhaled are severe irritants of the skin. It is therefore considered of value to report the following case:

S. B., a glazier aged 47, examined Oct. 5, 1937, had been handling window sashes which had been dipped in a mixture containing various chemicals. He inserted window glass in the sash with a putty which he himself had prepared with linseed oil. Near the end of July he noticed an itchy eruption, consisting of water blisters, on his face, hands and arms. He was treated at three local hospitals without relief; he used various local applications which enabled him to continue work, although on three occasions he had to stop for several days. While he was away from work his eruption was relieved, only to break out again when he returned.

Physical examination October 5 showed an eczematoid dermatitis of the hands, arms and face. The patient was to be tested with the various substances with which he came in contact at his work, but while preparing them I applied a small amount of the window sash solution to the skin and within a few minutes there was a marked positive reaction. Later I tested the patient by dropping on the skin the various ingredients contained in the dipping solution, namely mineral spirits, chlor-

orthophenyphenol and orthodichlorobenzene. The tests were negative except for that with orthodichlorobenzene. Two minutes after this was dropped on one arm intense erythema and edema developed at the site of the application and for one-half inch surrounding it. Later a large bullous lesion formed in the center of this area.

This case demonstrates the irritative properties of orthodichlorobenzene and shows that chemicals of unknown property should not be applied to the skin in the usual patch test manner, namely in an occlusive dressing, but should be dropped or painted on the skin and observed carefully for at least an hour.

520 Commonwealth Avenue.

Council on Pharmacy and Chemistry

PRELIMINARY REPORT OF THE COUNCIL

"VITAMIN K" A PRINCIPLE USEFUL IN CERTAIN HEMORRHAGIC CONDITIONS

THE COOPERATIVE COMMITTEE ON VITAMINS, REPRESENTING A COMBINED COMMITTEE OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND THE COUNCIL ON FOODS, CONSIDERED THE EVIDENCE FOR A PRINCIPLE CALLED "VITAMIN K," REPORTED TO BE USEFUL IN THE TREATMENT OF CERTAIN HEMORRHAGIC CONDITIONS. THE COMMITTEE RECOMMENDED THAT A PRELIMINARY REPORT BE ISSUED ON THIS PRINCIPLE AND THE RECOMMENDATION WAS ADOPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY. DR. SNELL OF THE MAYO FOUNDATION, WHO HAS BEEN WORKING WITH THIS PRINCIPLE, PREPARED THE APPENDED REPORT WHICH HAS BEEN ADOPTED BY THE COUNCIL FOR PUBLICATION AS A PRELIMINARY REPORT. THE COUNCIL AGREES WITH THE AUTHOR THAT THE PRINCIPLE KNOWN AS VITAMIN K APPEARS TO HAVE THERAPEUTIC USEFULNESS IN THE HEMORRHAGIC MANIFESTATIONS OF HEPATIC AND BILIARY DISEASE. THE COUNCIL HAS AUTHORIZED ITS COMMITTEE ON NOMENCLATURE TO STUDY THE QUESTION OF A SUITABLE NONPROPRIETARY NAME WHICH SHALL NOT BE THERAPEUTICALLY SUGGESTIVE. THE COUNCIL VOTED ALSO TO CONSIDER WITH VIEW OF ACCEPTANCE BRANDS OF "VITAMIN K" UNDER STRICTLY LIMITED CLAIMS FOR USEFULNESS IN THE HEMORRHAGIC DIATHESIS OF HEPATIC AND BILIARY DISEASE; THE COUNCIL AUTHORIZED PUBLICATION OF THE APPENDED REPORT.

PAUL NICHOLAS LEECH, Secretary.

VITAMIN K: ITS PROPERTIES, DISTRIBUTION AND CLINICAL IMPORTANCE

A PRELIMINARY REPORT

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In 1935 Dam¹ of Copenhagen observed that newly hatched chicks maintained on a diet which was deficient in certain fat-soluble materials, but otherwise adequate in respect to protein, minerals and all known vitamins, suffered from a fatal hemorrhagic diathesis characterized by bleeding from the pinfeathers, hemorrhages into the subcutaneous tissues and muscles and gizzard erosions. The hemorrhagic tendency in these chicks was associated with, and apparently due to, a fall in the concentration of prothrombin in the blood. The condition could be controlled or prevented by administration of the nonsaponifiable, nonsterol fraction of hog liver fat or by feeding alfalfa.² The protective, antihemorrhagic factor present in these last mentioned materials was tentatively named by Dam the "koagulations vitamin," or vitamin K.

DISTRIBUTION, PHYSICAL AND CHEMICAL PROPERTIES

Vitamin K, or at least substances possessing similar biological properties, are widely distributed in nature. In the plant kingdom the distribution appears to be con-

4. Schmidt, E. G.: The Determination of Sulfanilamide, *J. Biol. Chem.* 122: 757 (Feb.) 1938.

5. Marshall, E. K., Jr.: Determination of Sulfanilamide in Blood and Urine, *J. Biol. Chem.* 122: 263 (Dec.) 1937.

6. Whitby, L. E. H.: Chemotherapy of Pneumococcal and Other Infections, *Lancet* 1: 1210 (May 28) 1938.

1. Dam, Henrik: The Antihemorrhagic Vitamin of the Chick, *Biochem. J.* 29: 1273-1285 (June) 1935.

2. Almquist, H. J., and Stokstad, E. L. R.: Dietary Hemorrhagic Disease in Chicks, *Nature* 136: 31 (July 6) 1935.

fined almost entirely to the photosynthetic portion of the plant, considerable amounts having been found in alfalfa, kale, spinach, dried carrot tops, chestnut leaves, tomatoes and oat sprouts. In addition, vitamin K is found in soy bean oil and some other vegetable oils but is not present in significant amounts in fish liver oils.

The vitamin can also be prepared from fish meal, rice bran or casein after the extracted material has been allowed to putrefy, bacteria apparently effecting the synthesis of the vitamin under such conditions. Almquist and his associates³ have isolated a "fish meal organism" which closely resembles *Bacillus cereus* and which contains, and is capable of producing in fish meal, considerable amounts of vitamin K. The vitamin is also present in dried *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus* and many other micro-organisms, presumably being contained in the lipid fraction of these bacteria. Vitamin K may also be produced by bacterial activity in the intestinal tract and is present in the droppings of chicks and in both normal and acholic feces of man.

The physical and chemical properties of the vitamin are now being investigated, but little exact information is available at present. Almquist⁴ has prepared a colorless, crystalline, fat-soluble material which is heat stable but which is rapidly destroyed by alkalis or sunlight. This substance is probably a complex, unsaturated hydrocarbon of high molecular weight;⁵ it contains a small amount of nitrogen but no sulfur or phosphorus. Thayer, Doisy and their collaborators⁶ also have isolated a crystalline compound of high potency from alfalfa leaves. The crystals have a melting point of 69 C. and appear as small, transparent plates. These investigators pointed out that the vitamin may be adsorbed on these crystals and that there is evidence of more than one substance with antihemorrhagic activity in their extracts. Almquist⁷ has shown that the factor preventing gizzard erosions in chicks is not identical with vitamin K, and Lichtman and Chambers⁸ have recently prepared a sterol, an alkali stable material with vitamin K activity, from liver fat. Possibly several closely related substances having some antihemorrhagic properties are present in crude extracts of alfalfa or putrefied fish meal. Present methods of assay are hardly sufficiently specific to identify such compounds, depending as they do on biologic methods alone. The antihemorrhagic properties of any given material can be determined only by its activity on K-avitaminous chicks. Some attempts have been made to establish a unit of measurement for the vitamin on this basis. Dann⁹ has defined a unit as the least amount per gram of a chick's body weight daily which is necessary to prevent prolongation of clotting time beyond normal limits. Dann's unit is defined as the amount of antihemorrhagic material contained in 1 Gm. of dried spinach. Until more information is available with

regard to the chemical and biologic properties of the vitamin, any attempts to establish a "unit" are necessarily somewhat arbitrary and of limited value.

CLINICAL USE OF VITAMIN K

The use of the antihemorrhagic vitamin in clinical medicine depends on the following facts: (1) that in obstructive jaundice and in disease of the parenchyma of the liver there is a deficiency of prothrombin in the plasma, and (2) that this deficiency represents one manifestation of K-avitaminosis, although the stools of such patients can be shown to contain the vitamin. The deficient formation of prothrombin in such patients depends in part on a failure of absorption of fat soluble substances when bile is excluded from the intestinal tract, or when the secretion of bile salts by the liver is reduced. There is also another and perhaps a more important factor, namely the ability of the liver to utilize vitamin K in the formation of prothrombin. To discuss all the clinical and experimental data bearing on this subject is beyond the scope of this report, but certain studies may be cited.

Quick¹⁰ was apparently the first to call attention to a deficiency of prothrombin in the blood of jaundiced patients; he established this point by the method of adding optimal amounts of thromboplastin to recalcified plasma, leaving prothrombin as the only variable and then recording the coagulation time of this mixture. Smith and his associates¹¹ have amply confirmed this observation by a quantitative study of prothrombin in cases of jaundice. Hawkins and Brinkhous¹² have demonstrated by the last-mentioned method a similar deficiency of prothrombin in dogs with complete biliary fistula and have shown that the feeding of bile to these animals will produce a rise in the concentration of prothrombin and cessation of bleeding, if present. Bile feeding has been shown to produce a comparable effect in cases of obstructive jaundice. The role of hepatic injury in the synthesis of prothrombin has been studied by Smith, Warner and Brinkhous,¹³ who found that in experimental chloroform intoxication a marked deficiency in prothrombin could be produced. An earlier observation bearing on this point was made by Roderick,¹⁴ who noted a deficiency of prothrombin in cattle with toxic sweet clover disease, a condition which is associated with necrosis of the liver.

Reports on the treatment of the hemorrhagic diathesis in obstructive jaundice have recently appeared from the University of Iowa¹⁵ and from the Mayo Clinic.¹⁶

3. Almquist, H. J.; Pentler, C. F., and Mecchi, E.: Synthesis of the Antihemorrhagic Vitamin by Bacteria, *Proc. Soc. Exper. Biol. & Med.* **35**: 336-338 (April) 1938.

4. Almquist, H. J.: Further Studies on the Antihemorrhagic Vitamin, *J. Biol. Chem.* **120**: 635-646 (Sept.) 1937.

5. Klose, A. A.; Almquist, H. J., and Mecchi, E.: Properties of the Antihemorrhagic Vitamin (Vitamin K), *J. Biol. Chem.* **125**: 681-686 (Oct.) 1938.

6. Thayer, S. A.; MacCorquodale, D. W.; Binkley, S. B., and Doisy, E. A.: The Isolation of a Crystalline Compound with Vitamin K Activity, *Science* **88**: 243 (Sept. 9) 1938.

7. Almquist, H. J., and Stokstad, E. L. R.: A Nutritional Deficiency Causing Gizzard Erosions in Chicks, *Nature* **137**: 581-582 (April 4) 1936.

8. Lichtman, A. L., and Chambers, W. H.: Reduced Blood Coagulation Time by Injection of Sterol Extract of Liver, *Science* **88**: 358-359 (Oct. 14) 1938.

9. Dann, Clementine P.: Personal communication to the author.

10. Quick, A. J.; Stanley-Brown, Margaret, and Bancroft, F. W.: A Study of the Coagulation Defect in Hemophilia and in Jaundice, *Am. J. M. Sc.* **190**: 501-511 (Oct.) 1935.

11. Warner, E. D., Smith, H. P., and Brinkhous, K. M.: Quantitative Study of Blood Coagulation in Normal and Jaundiced Dogs, *Am. J. Physiol.* **124**: 111-115 (June) 1936.

12. Hawkins, E. D., and Brinkhous, K. M.: Deficiency of Prothrombin in Dogs with Bile Fistula, *J. Exper. Med.* **63**: 795-801 (June) 1936.

13. Smith, H. P.; Warner, E. D., and Brinkhous, K. M.: Prothrombin Deficiency and the Bleeding Tendency in Liver Injury (Chloroform Intoxication), *J. Exper. Med.* **66**: 801-811 (Dec.) 1937.

14. Roderick, L. M.: The Pathology of Sweet Clover Disease in Cattle, *J. Am. Vet. M. A.* **74**: 314-326 (Feb.) 1929; A Problem in the Coagulation of the Blood: "Sweet Clover Disease of Cattle," *Am. J. Physiol.* **96**: 413-425 (Feb.) 1931.

15. Warner, E. D.; Brinkhous, K. M., and Smith, H. P.: Bleeding Tendency of Obstructive Jaundice: Prothrombin Deficiency and Dietary Factors, *Proc. Soc. Exper. Biol. & Med.* **37**: 628-630 (Jan.) 1938.

16. Brinkhous, K. M.; Smith, H. P., and Warner, E. D.: Prothrombin Deficiency and the Bleeding Tendency in Obstructive Jaundice and in Biliary Fistula: Effect of Feeding Bile and Alfalfa (Vitamin K), *Am. J. M. Sc.* **196**: 50-57 (July) 1938.

17. Snell, A. M.; Magath, T. B.; Boland, E. W.; Osterberg, A. E.; Butt, H. R.; Bollman, J. L., and Walters, W. M.: Symposium: The Hemorrhagic Diathesis in Cases of Jaundice: Its Relation to Vitamin K, *A Preliminary Report, Proc. Staff Meet., Mayo Clin.* **13**: 65-89 (Feb. 2) 1938.

18. Snell, A. M.; Butt, H. R., and Osterberg, A. E.: Treatment of the Hemorrhagic Tendency in Jaundice, with Special Reference to Vitamin K, *Am. J. Digest. Dis. & Nutrition* **5**: 590-596 (Nov.) 1938.

19. Snell, A. M.; Butt, H. R., and Osterberg, A. E.: Treatment of the Hemorrhagic Tendency in Jaundice, with Special Reference to Vitamin K, *Am. J. Digest. Dis. & Nutrition* **5**: 590-596 (Nov.) 1938.

These studies, which were made independently, show that a definite reduction in the prothrombin clotting time (Quick), an increase in the quantitative level of prothrombin in the blood, and even control of actual hemorrhagic states can be accomplished by the oral administration of extracts of alfalfa or of putrefied fish meal, together with bile or bile salts. It has been emphasized that adequate preoperative treatment with these materials will greatly reduce the hemorrhagic tendency commonly observed in cases of jaundice. However, such treatment may not ensure normal blood coagulation in the postoperative state, since a marked fall in the concentration of prothrombin may occur in many cases following operation. The large excess of prothrombin in mammalian blood may be sufficient to protect such patients, but in others serious bleeding may take place. Even in patients presenting marked depletion of prothrombin the control of the hemorrhagic state is possible by the use of large doses of vitamin K concentrates and bile salts. Rapid correction of the coagulation defect has been observed even in the presence of complete biliary obstruction and hepatic injury; the rate of prothrombin formation seems to follow the chemical laws of mass action.

In view of the fact that standard methods of determining the coagulation time of blood give little warning of the possibilities of hemorrhage in cases of jaundice, it is advisable either to use vitamin K concentrates and bile salts as a routine part of preoperative and postoperative treatment or to be guided by some of the various indirect methods now in use for the detection of a deficiency in prothrombin. Of these the Quick prothrombin time is perhaps the most satisfactory for general use; the quantitative determination of prothrombin by the method of Smith and his collaborators¹¹ is technically difficult but very reliable. Dam and his associates¹⁷ in their investigations have used a modification of the Fisher method for determining the clotting time of avian blood. The earlier one is able to detect by laboratory means the first signs of impending prothrombin deficiency, the less vitamin concentrate is required for its control and the less the danger of serious loss of blood.

The amounts of material required for prophylactic or curative treatment are still under investigation. For the former, the daily use of from 400 to 800 mg. of an alfalfa concentrate (2,000 to 4,000 Dann units) with 1 to 2 Gm. of bile salts has been advised; for the latter from 1 to 3 Gm. (5,000 to 15,000 Dann units) plus fistula bile, lyophilized bile or from 2 to 4 Gm. of animal bile salts may be administered by duodenal tube at appropriate intervals. One or two such doses are usually sufficient to raise the concentration of prothrombin to a safe level. Dam and Glavind¹⁸ have advocated the parenteral use of vitamin K concentrate in oil and have shown a gradual reduction in clotting time following such treatment. The Mayo Clinic investigators,¹⁹ however, have found that doses of 1 Gm. or more of the

material, administered parenterally, are decidedly less effective and much more slowly utilized by the body than are similar amounts given directly into the intestinal tract.

Up to the present, little is known of the effect of vitamin K in other hemorrhagic diseases. In the light of present knowledge there is no reason to expect a favorable effect if the prothrombin content of blood is normal. In cases of sprue and in cases of extensive regional ileitis, deficiency in prothrombin because of an insufficient intestinal absorption of vitamin K has been noted, and in such circumstances there are theoretical reasons for administration of the vitamin. Purpuric states, hemophilia and essential hematuria are not affected by vitamin K therapy; on the other hand, recurrent hemorrhagic retinitis and certain forms of functional menorrhagia are said to have shown some response.

Indiscriminate use of vitamin K in hemorrhagic diseases of all types should be discouraged, although to date there has been no evidence of any toxic effects even with very large doses. Work is in progress at present on the chemical structure of the vitamin and related compounds, on the relation of the vitamin to prothrombin and on the metabolism of the latter substance in other diseases. Until these studies are completed, therapeutic efforts with vitamin K are best confined to the hemorrhagic diathesis of hepatic and biliary disease, in which the results appear to be almost specific.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

CINCHOPHEN (See New and Nonofficial Remedies, 1938, p. 177).

CINCHOPHEN-THE UPJOHN COMPANY.—A brand of cinchophen-N. F.

Manufactured by The Upjohn Company, Kalamazoo, Mich.

Tablets Cinchophen-The Upjohn Co., 5 grains.

Tablets Cinchophen-The Upjohn Co., 1½ grains.

EPHEDRINE SULFATE (See New and Nonofficial Remedies, 1939, p. 228).

EPHEDRINE SULFATE-MERRELL.—A brand of ephedrine sulfate-U. S. P.

Manufactured by Wm. S. Merrell Co., Cincinnati, Ohio. No U. S. patent or trademark.

Ampule Solution Ephedrine Sulfate-Merrell, 0.05 Gm. (¼ grain), 1 cc.

MERCURIC SUCCINIMIDE (See New and Nonofficial Remedies, 1938, p. 299).

Ampule Solution Mercury Succinimide-Merrell, 0.01 Gm. (⅒ grain), 1 cc.

Prepared by the Wm. S. Merrell Co., Cincinnati, Ohio. No U. S. patent or trademark.

NICOTINIC ACID (See THE JOURNAL, July 2, 1938, p. 27, and the Revised Supplement to N. N. R., 1938, p. 22).

Nicotinic Acid-Merck.—A brand of nicotinic acid-N. N. R.

Manufactured by Merck & Co., Rahway, New Jersey. No U. S. patent or trademark.

SODIUM THIOSULFATE (See New and Nonofficial Remedies, 1938, p. 450).

Ampuls Solution Sodium Thiosulfate-Maltbie, 1 Gm. (15½ grains), 10 cc.

Prepared by The Maltbie Chemical Company, Newark, N. J.

17. Dam, Henrik, and Glavind, Johannes: The Clotting Power of Human and Mammalian Blood in Relation to Vitamin K, *Acta med. Scandinav.* 96: 108-128, 1938.

18. Dam, Henrik; Glavind, Johannes; Lewis, Liese, and Tage-Hansen, Erik: Studies on the Mode of Action of Vitamin K, *Scandinav. Arch. f. Physiol.* 79: 121-133 (Aug.) 1938.

19. Butt, H. R.; Snell, A. M., and Osterberg, A. E.: Further Observations on the Use of Vitamin K in the Prevention and Control of the Hemorrhagic Diathesis in Cases of Jaundice, *Proc. Staff Meet., Mayo Clin.* 13: 753-764 (Nov. 30) 1938.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, APRIL 15, 1939

CANINE ABORTION AND HUMAN PARATYPHOID

Veterinarians have long suggested that dogs are susceptible to human paratyphoid B infections and that under certain conditions they may be the sole source of transmission of this disease to man. Two years ago a local epidemic of paratyphoid was noted in an isolated Swedish village. Two weeks before the beginning of the epidemic a pregnant setter of the village had suffered a severe gastro-enteritis and had aborted. After the development of the epidemic the local physician¹ took samples of stools, urine and blood from the convalescent dog. The blood sample gave a positive Widal reaction with a standard laboratory strain of *Salmonella paratyphi B* (schottnülleri). Both convalescent urine and stools, however, were negative at the time of the examination.

A year later a second local paratyphoid epidemic was noted in another isolated Swedish village. This epidemic also was accompanied with one or more cases of canine abortion. An atypical paratyphoid bacillus was isolated in the human cases. The dogs were not examined. As a precautionary measure, however, a valuable pregnant dog was sent from this village to an isolated farm about 4 kilometers distant. Two days after arrival the dog became desperately ill with enteritis and aborted. Following this abortion, four members of the rural family caring for the dog became ill with typical paratyphoid infection. Blood and stools were collected by the attending physician² from the four patients and from the dog and sent to the National Laboratory at Stockholm for bacteriologic examination. An atypical paratyphoid strain was isolated from each of the five stools. All five blood samples gave positive agglutinin reactions with this strain, the canine serum agglutinating it in a dilution of 1:250.

Fractional antigens were isolated from this bacillus and compared with similar fractions from standard laboratory strains. At least four heterophile antigenic factors were demonstrated or deduced from cross

agglutination tests, together with one fairly specific factor, which was tentatively assumed to be diagnostic of the canine bacillus. The name *Salmonella abortus canis* was suggested for this canine paratyphoid B bacillus.

Theoretically the new micro-organism may be pictured as a relatively primitive, less highly specialized type of the paratyphoid bacillus, a possible ancestor of more highly specialized strains isolated in strictly human cases. The cultural stability of this canine variant has not yet been tested.

BAKER AND KOCH "CANCER CURES" TRY NEW ZEALAND

According to a report in the *British Medical Journal* the American "cancer cures" promoted by William F. Koch and Norman Baker have been investigated by a committee of qualified medical experts in New Zealand.¹ On Aug. 31, 1938, fifteen patients who had been treated by the Koch and Baker fluids were carefully examined by members of the committee. It was decided that six of the patients had cancer and six were probably cancerous, while three definitely did not have cancer. The examiners were especially interested in four cases of cancer of the breast which had been treated with local injections of the Baker² fluid around the periphery of the breast ten days prior to examination and also with intravenous injection of Koch's³ fluid the day before. In each case the whole of the breast and a varying but extensive surrounding area were completely gangrenous, black and malodorous.

Dr. Williams, who administered the treatments, gave the committee the impression that Baker's fluid destroyed all cancerous tissue exclusively and selectively and that the Koch fluid searched out all cancerous cells throughout the body, wherever they might be, and destroyed them.

The patients were seen again on September 14, and two of them were decidedly worse. In all cases the cancerous breast had sloughed away, together with surrounding tissue extending in one instance from the center of the breast bone to the posterior margin of the armpit. With one exception there had been no signs of healing, and it was noted that it would require a long time for healing of such large areas to occur. There was a great amount of mutilation.

1. The committee which investigated these remedies consisted of Sir James Elliott, M.D., chairman, Mr. H. Hardwick-Smith, F.R.C.S., Dr. J. O. Mercer and Dr. T. R. Ritchie. Sir James Elliott is president of the New Zealand Branch of the British Empire Cancer Campaign, Dr. Mercer is a recognized pathologist (M.R.C.P.), and Dr. Ritchie is director of the Division of Public Hygiene of the Department of Health. This committee was acceptable to a Dr. Williams, who apparently is the one who requested the test.

2. Previous references to Norman Baker and his treatment of cancer appeared in *THE JOURNAL* 94:1146, 1241, 1340 (April 12, 19 and 26) 1930; 95:285 (July 26) 1930; 96:43, 1167, 2042 (Jan. 3, April 4 and June 13) 1931; 98:890, 1012 (March 12 and 19) 1932; 99:1355 (Oct. 15) 1932; 104:929 (March 16) 1935; 105:375 (Aug. 3) 1935; 109:375, 616, 798 (July 31, Aug. 21 and Sept. 4) 1937; 110:749 (March 5) 1938; 111:566 (Aug. 6) 1938; 112:435 (Feb. 4) 1939.

3. Previous references to William F. Koch and his treatment of cancer appeared in *THE JOURNAL* 76:466 and 537 (Feb. 12 and 19) 1921; 82:2054 (June 21) 1924; 86:1469 (May 8) 1926; 88:928 (March 19) 1927; 103:116 (July 14) 1934; 106:929 and 2189 (March 14 and June 20) 1936; 107:519 (Aug. 15) 1936.

1. Caspersen, J.: *Ztschr. f. Hyg. u. Infektionskr.* 120:611, 1938.
2. Magnusson, K. E.: *Ztschr. f. Hyg. u. Infektionskr.* 121:136 (Oct.) 1938.

About this time the investigations were ordered ceased by Dr. Williams, apparently for the reason outlined in a letter in which he said:

"Since both Baker and Koch have written to me in the strongest terms, declining to submit their products to test in their absence, I have no alternative to breaking up negotiations with your committee."

The committee, although thwarted in carrying its investigations to their indicated conclusion, stated:

"We have no doubt that Baker's fluid is a powerful sclerotic agent and can cause great local destruction. Compared with surgical treatment, destruction by a sclerosing or caustic fluid seems like a reversal to the treatment of the Middle Ages, causing unnecessary mental distress, delayed healing, and increased risk of septic infection. We have had no evidence whatever to show that Baker's fluid has any selective powers in the destruction of cancer cells. There is no real difficulty in removing the breast surgically or by crude destruction, but this is very far from a cure of the breast cancer and may delude the public mind. . . . From our general knowledge⁴ and from the observations we were permitted to make in investigating the cases at Wanganui, we have no reason whatever to suppose that Koch's fluid has any effect in curing a generalized cancer. . . . This claim that a cure has been found for cancer should never be made and promulgated until prolonged tests have shown that the claim is a reasonable one. . . .

"Your committee considers that it is in the public interest that a statement should be made that our hope of finding anything useful in the treatment recommended by Dr. Williams and his colleagues has proved illusory."

The story speaks for itself. Nevertheless, it should be emphasized that the use of these treatments was permitted without any evidence in the scientific literature to support the use of either fluid. The committee's reference to the dark ages is particularly apt. In a day when medical science progresses on the basis of established fact, as determined by careful experimentation and even more careful clinical trial, with frequent reports in the literature covering the various steps, there is absolutely no excuse for the employment of methods of treatment completely devoid of scientific support.

THE NUTRITIVE VALUE OF WHEAT FLOUR AND BREAD

Bread, throughout the ages, has been the symbol for food. The annual per capita consumption of wheat bread alone in the United States is over 80 pounds, and the yearly consumption of all types of bread is almost 90 pounds. Bread is a concentrated food and is one of the cheapest sources of energy. During the past three decades a large number of investigations have thrown light on the nutritive quality of bread. A recent report of Copping¹ reviews the present status of our knowledge of the problem.

Although bread is an important food, it is by no means a complete foodstuff. It consists essentially of flour and water, charged with carbon dioxide as a result of action of leavening agents, and baked. Its nutritive

value depends principally on the flour used in its preparation. There is considerable variation in the nutritive value of flour. The process of milling wheat does not seriously affect the protein or the carbohydrate content of the flour, but it does appreciably reduce the amount of fat and ash present. Only about 70 per cent of the screened wheat is recovered in the preparation of standard grade white flour. By further milling finer flours are obtained and in these cases the extraction is even less.

The question of the extent to which various degrees of milling affect the nutritive value of the flour obtained from wheat is of particular importance. Although the preparation of flour from wheat by milling does not greatly alter the proportion of protein, experience indicates that the nutritive value of the protein of whole wheat is superior to that of the protein of various flours milled from it. In other words, in the modern process of milling the biologic value of wheat protein is lowered for nitrogen repair as well as for growth of the animal organism. The process of milling seriously affects the ash content of flour. The removal of wheat bran and wheat germ in the preparation of white flour effects a reduction in mineral content to about one half for calcium, one fourth for potassium, one fifth for phosphorus and one fifth for iron. The loss of calcium and phosphorus is probably not of great importance, as wheat, like most other cereals, shows an ill proportioned ratio of calcium to phosphorus. In this connection it has long been suspected that in the absence of vitamin D many cereals exert an anticalcifying effect and, as a consequence, an anticalcifying factor was alleged to be present in cereals. Recently, however, Mottram and Palmer² have shown that the rachitogenic effect of a pure cereal diet can be counteracted by merely adding sufficient calcium to produce a favorable calcium:phosphorus ratio. The loss of iron in the process of milling wheat is, however, of importance, since Rose and her co-workers³ have shown that iron present in whole wheat meal is well absorbed and is efficiently used in the regeneration of hemoglobin.

Although wheat flour is practically devoid of vitamin D and vitamin C and ordinarily possesses but an insignificant amount of provitamin A, its content of the B group of water-soluble vitamins is not inconsiderable. An examination of white wheat bread, however, reveals that it contains only about one fourth to one sixth as much thiamin (vitamin B₁) as whole wheat bread. Investigation has also shown that bread prepared from whole wheat flour contains a larger percentage of the vitamin B complex than that prepared from white flour. Whole wheat grain contains an appreciable amount of provitamin A, carotene, but since this constituent imparts to the flour a yellow color which is considered undesirable, bleaching agents are often

4. The committee stated that it was influenced by investigations made of both the Baker and the Koch treatment in the United States of America under more favorable conditions, which had been uniformly condemnatory.

1. Copping, A. M.: *Nutrition Abstr. & Rev.* 8:555 (Jan.) 1939.

2. Mottram, J. C., and Palmer, N.: *Cereal Chemistry* 14:682, 1937.

3. Rose, Mary S.; Valitich, Ella M., and Bloomfield, Emily L.: *Proc. Soc. Exper. Biol. & Med.* 26:322 (Jan.) 1929.

used which destroy the color as well as a large percentage of the carotene. The germ of wheat has important nutritive properties. Rejection of wheat germ in the process of milling involves loss of an important source of these factors. Although little is known of the human requirement for these accessory food factors found in wheat germ, it seems probable, in the light of animal experimentation, that they are important for the nutrition of man.

Although it seems unfortunate that so much of the nutritive value of wheat grain is sacrificed by the modern process of milling, the predominant position of the cereals in the dietary justifies the position occupied by bread. By suitable supplementation with other foods, the essential economy of bread can be enjoyed without sacrificing the nutritional excellence of the dietary as a whole.

Current Comment

AMERICAN OPHTHALMOLOGICAL SOCIETY

In June of this year the American Ophthalmological Society will celebrate its seventy-fifth anniversary. On June 7, 1864, this society, the first in the United States devoted exclusively to ophthalmology, was formed. That first meeting was held at the New York Eye Infirmary with eighteen in attendance from New York, Boston, Philadelphia and Poughkeepsie. The society has always stood for the highest ideals in practice of medicine. Its imminent anniversary celebration serves to emphasize the increasing maturity of American scientific medicine.

EFFECTS OF VITAMIN B COMPLEX ON EXPERIMENTAL HYPERTHYROIDISM

The effect of crystalline thiamin chloride (vitamin B₁ hydrochloride) and the vitamin B complex (yeast) on experimental hyperthyroidism was studied by Drill and Sherwood¹ on rats fed various diets. The study was designed (1) to feed rats a synthetic diet containing sufficient amounts of yeast for growth, (2) to feed thyroid gland to rats receiving the same diet and produce a loss of weight, and (3) to administer crystalline thiamin chloride and additional yeast to the hyperthyroid rats while they were still receiving thyroid gland, in an effort to enable them to regain their lost weight. As a result of their carefully balanced and controlled experiments on rats, these investigators found that thiamin chloride and yeast will enable hyperthyroid rats which have lost weight to regain their lost weight while still receiving thyroid gland. One important factor in this result is the fact that thiamin chloride and yeast concentrate greatly stimulated the food intake of hyperthyroid rats. It is not, however, the only factor; although thiamin chloride will stimulate the food intake, the rats will not gain weight under the conditions employed until a rich source of the vitamin B

complex is added to the diet. Furthermore, hyperthyroid rats limited to 13 Gm. of food will not stop losing weight even when thiamin chloride and yeast are administered, nor will thiamin chloride and yeast enable hyperthyroid rats that are entering into the diestrus to maintain a normal estrous cycle. In fact, the estrual cycle of normal rats is not influenced by the daily injection of 500 micrograms of thiamin chloride for as long as forty-four days. These interesting experiments shed additional light on the function of these vitamin complexes in relation to the action of the thyroid gland, at least in the experimental animal used.

SYNERGIC ALLERGY IN TUBERCULOSIS

The demonstration by Sabin and Joyner¹ of the Rockefeller Institute that a mixture of tuberculoproteins and phosphatides causes a degree of sensitivity in laboratory animals comparable to that occurring in natural infections is important as a contribution to the newer theories of synergic immunity. The result renews hope of the ultimate development of a nonviable tuberculosis vaccine. Earlier work with antigenic fraction from the tubercle bacillus has been uniformly disappointing. Forty years of intensive research with these antigens led to the generally accepted conclusion that a nonviable tuberculosis vaccine cannot be clinically effective. While this conclusion has been recently challenged by Opie, it is still the accepted belief of most immunologists. The studies by Sabin and her co-workers seemed to confirm this belief. Different chemical fractions of tubercle bacilli were found to produce widely different local and humoral reactions in experimental animals, none of which could be regarded as a complete immunity. Following Burky's² demonstration of synergic effects with mixed antigens, the Rockefeller Institute immunologists began a study of the possibility of sensitizing or immunizing animals with mixtures of two or more of their earlier antigenic fractions. Their initial success is from a mixture of ordinary tuberculoproteins and tuberculophosphatides. Confirming the work of other investigators they found that guinea pigs can be sensitized by repeated intradermal injections with tuberculoprotein but that animals so sensitized will not react to the routine tuberculin test. Guinea pigs sensitized by multiple intradermal injections with tuberculophosphate also show atypical sensitivity, since they do not exhibit the Koch phenomenon. The phosphatide and tuberculoproteins, however, apparently supplement each other in antituberculosis immunity. Following intradermal injections with a mixture of these two antigenic fractions, routine diagnostic reactions are given by the sensitized guinea pigs that are qualitatively and quantitatively identical with those of tuberculous animals. Whether or not this synergic sensitivity is accompanied by an equally effective synergic immunity has not yet been determined. Even though a full immunity is not obtained with the present antigenic mixture, this work represents a distinct advance in the basic theory of immunity in tuberculosis.

1. Drill, V. A., and Sherwood, C. R.: The Effect of Vitamin B₁ and the Vitamin B₂ Complex on the Weight, Food Intake, and Estrual Cycle of Hyperthyroid Rats, *Am. J. Physiol.* 124: 683 (Dec. 1) 1938.

1. Sabin, Florence R., and Joyner, Austin L.: *J. Exper. Med.* 68: 559 (Nov.) 1938.

2. Burky, E. L.: *J. Allergy* 5: 466 (July) 1934.

ORGANIZATION SECTION

THE ST. LOUIS SESSION

AMERICAN MEDICAL ASSOCIATION, NINETIETH ANNUAL SESSION

ST. LOUIS, MO., MAY 15-19, 1939

OFFICIAL CALL

TO THE OFFICERS, FELLOWS AND MEMBERS OF THE AMERICAN MEDICAL ASSOCIATION

The ninetieth annual session of the American Medical Association will be held in St. Louis, May 15-19, 1939.

The House of Delegates will convene at 10 a. m., Monday, May 15. In the House the representation of the various constituent associations for 1938, 1939 and 1940 is as follows:

Alabama	2	New Hampshire	1
Arizona	1	New Jersey	4
Arkansas	2	New Mexico	1
California	7	New York	19
Colorado	2	North Carolina	2
Connecticut	2	North Dakota	1
Delaware	1	Ohio	7
District of Columbia	1	Oklahoma	2
Florida	2	Oregon	1
Georgia	3	Pennsylvania	11
Idaho	1	Rhode Island	1
Illinois	9	South Carolina	2
Indiana	4	South Dakota	1
Iowa	3	Tennessee	3
Kansas	3	Texas	6
Kentucky	3	Utah	1
Louisiana	2	Vermont	1
Maine	1	Virginia	2
Maryland	2	Washington	2
Massachusetts	7	West Virginia	3
Michigan	5	Wisconsin	1
Minnesota	3	Wyoming	1
Mississippi	2	Alaska	1
Missouri	4	Hawaii	1
Montana	1	Isthmian Canal Zone	1
Nebraska	2	Philippine Islands	2
Nevada	1	Puerto Rico	1

The fifteen scientific sections of the American Medical Association, the Medical Corps of the Army, the Medical Corps of the Navy and the Public Health Service are entitled to one delegate each.

The Scientific Assembly of the Association will open with the general meeting, to be held at 8 p. m., Tuesday, May 16. The sections will meet Wednesday, Thursday and Friday, May 17, 18 and 19, as follows:

CONVENING AT 9 A. M., THE SECTIONS ON

Practice of Medicine.	Preventive and Industrial
Obstetrics and Gynecology.	Medicine and Public Health.
Laryngology, Otology and	Urology.
Rhinology.	Orthopedic Surgery.
Pathology and Physiology.	Miscellaneous Topics: Ses-
	sion on Anesthesia.

CONVENING AT 2 P. M., THE SECTIONS ON

Surgery, General and Abdom-	Nervous and Mental Diseases.
inal.	Dermatology and Syphilology.
Ophthalmology.	Gastro-Enterology and Proc-
Pediatrics.	tology.
Pharmacology and Therapeu-	Radiology.
tics.	

The Registration Department will be open from 8:30 a. m. until 5:30 p. m., Monday, Tuesday, Wednesday and Thursday, May 15, 16, 17 and 18, and from 8:30 a. m. to 12 noon, Friday, May 19.

IRVIN ABELL, President.

H. H. SHOULDERS, Speaker, House of Delegates.

OLIN WEST, Secretary.

MEMBERS OF THE HOUSE OF DELEGATES

A Preliminary Roster of the Legislative Body of the American Medical Association

The list of members of the House of Delegates for the session is incomplete, as a number of the state associations are yet to hold their meetings at which delegates will be elected. The following is a list of the holdover members of the House of Delegates and of the newly elected members who have been reported to the Secretary in time to be included:

STATE DELEGATES

ALABAMA	John J. Pfock, Chicago. E. S. Hamilton, Kankakee.
ARIZONA	Don F. Cameron, Fort Wayne. F. S. Crockett, LaFayette. George R. Dillinger, French Lick. H. G. Hamer, Indianapolis.
ARKANSAS	Edward E. Barlow, Dermott. William R. Brooksher, Fort Smith.
CALIFORNIA	Elbridge J. Best, San Francisco. Lyell C. Kinney, San Diego. J. P. Nuttall, Santa Monica. Edward M. Palette, Los Angeles. George G. Reinle, Oakland. Robert A. Peers, Colfax. William R. Molony Sr., Los Angeles.
COLORADO	John Andrew, Longmont. Walter W. King, Denver.
CONNECTICUT	George Blumer, New Haven. Walter R. Steiner, Hartford.
DELAWARE	William H. Speer, Wilmington.
DISTRICT OF COLUMBIA	Henry Cook Macatee, Washington.
FLORIDA	Herbert L. Bryans, Pensacola.
GEORGIA	Olin H. Weaver, Macon. William H. Myers, Savannah. Charles W. Roberts, Atlanta.
IDAHO	E. N. Roberts, Pocatello.
ILLINOIS	G. Henry Mundt, Chicago. R. K. Packard, Chicago. Charles J. Whalen, Chicago.
INDIANA	John J. Pfock, Chicago. E. S. Hamilton, Kankakee.
IOWA	Thomas F. Thornton, Waterloo. V. L. Treyner, Council Bluffs.
KANSAS	Howard L. Snyder, Winfield.
KENTUCKY	Virgil E. Simpson, Louisville. Elmer L. Henderson, Louisville. Arthur T. McCormack, Louisville.
LOUISIANA	James O. Graves, Monroe. A. A. Herold, Shreveport.
MAINE	William A. Ellingwood, Rockland.
MARYLAND	Alfred T. Gundry, Catonsville. Harvey B. Stone, Baltimore.
MASSACHUSETTS	David D. Seannell, Boston. Dwight O'Hara, Waltham. Charles E. Mongan, Somerville. Walter G. Phippen, Salem. Richard H. Miller, Boston. Edmond F. Cody, New Bedford. John M. Birnie, Springfield.
MICHIGAN	L. G. Christian, Lansing. Henry A. Luce, Detroit. T. K. Gruber, Eloise. Frank E. Reeder, Flint. Claude R. Keyport, Grayling.
MINNESOTA	E. A. Meyerding, St. Paul. W. F. Braasch, Rochester. W. A. Coventry, Duluth.

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DERMATOLOGY AND SYPHILOLOGY

Clyde L. Cummer, Cleveland.

PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH

Stanley H. Osborn, Hartford, Conn.

UROLOGY

H. C. Bumpus, Pasadena, Calif.

ORTHOPEDIC SURGERY

Willis C. Campbell, Memphis, Tenn.

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ST. LOUIS, THE HUB OF THE NATION, WELCOMES YOU!

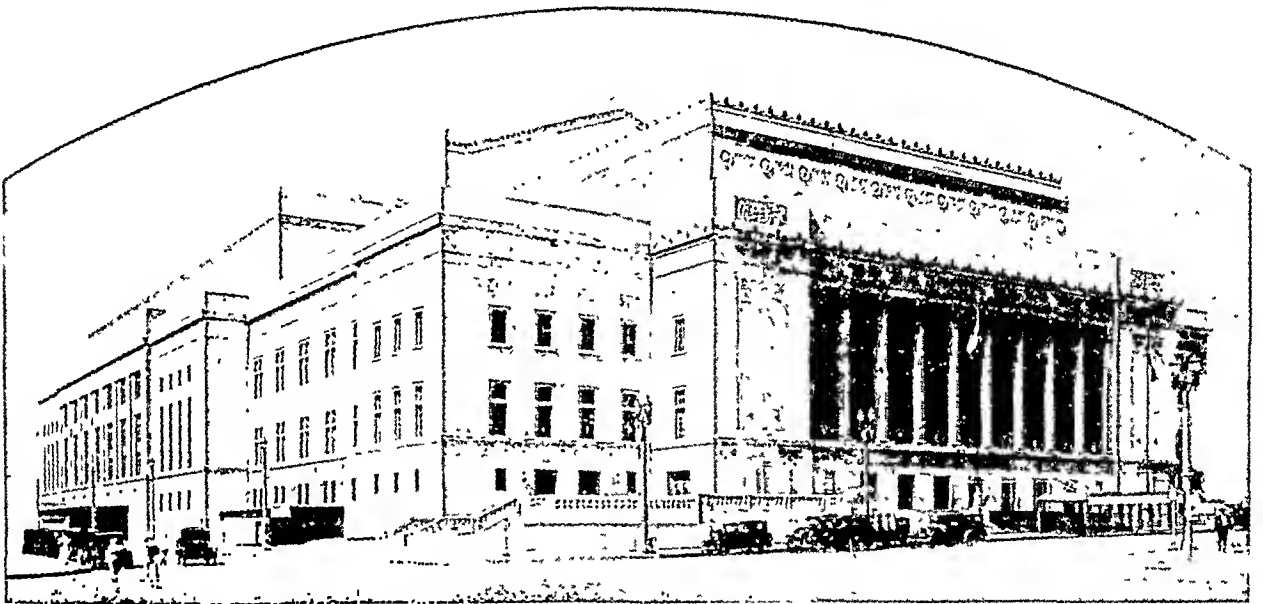
Famous for its magnificent buildings, parks and boulevards, St. Louis has steadily advanced into metropolitan areas since the French pioneers landed in 1764, at what is now the foot of Walnut Street. Like the landing of the Pilgrim Fathers, the coming of the "First Thirty," as this band became known, marked the beginning of a great empire. On the morning of February 16, August Chouteau led his men to the plateau overlooking the river. The blows of axes sounded through the woods and the building of St. Louis began.

Within three years the colonists had established fur trading monopolies with the twenty-eight principal Indian nations. Each year saw the city's influence widen. St. Louis became the starting point of expeditions in all directions, some military, to establish forts; some scientific, to explore, and others to establish communities to open commercial avenues. One of these was the Lewis and Clark expedition in 1804, opening the Northwest

ing, while nearby are the Public Library, the new post office and the new police headquarters. St. Louis has become architecturally renowned also through its thirty-one story telephone building, the huge railway exchange building, the majestic new cathedral and the Scottish Rite Cathedral. It was among the first large American cities to adopt city planning and has not only its plaza but widened boulevards, sunken gardens and other examples of serene beauty in the downtown section.

THE MUNICIPAL AUDITORIUM

The new \$6,000,000 St. Louis auditorium, where the sessions will be held, makes an impression of massive dignity and power as one approaches across the expansive plaza of this great temple dedicated to the people. Within its walls softly padded avenues lead into three large assembly units: the great opera house, the stupendous arena and the expansive exposition hall. Here is



MUNICIPAL AUDITORIUM WHERE THE ANNUAL SESSION WILL BE HELD

The Frenchmen of St. Louis also paved the way for the American occupation of Louisiana. A branch of the Chouteau family founded Kansas City. Robidoux of St. Louis established St. Joseph. One of the Menards founded Galveston.

Fully a hundred western cities and towns owe their beginning to St. Louisans.

The year 1811 marked the appearance of the Mississippi steamboat. Five years later the first steamboat came up the river, and for fifty years river trade grew by leaps and bounds.

St. Louis today is one of the most modern cities in America. Geographically it meets you half way, and in hospitality it goes the whole way. Visitors will enjoy seeing the Art Museum, the Cahokia Mounds, Chain of Rocks Park, the Confederate Memorial, the Dent House, Eads Bridge, Forest Park, Grant's Log Cabin, Jefferson Memorial, the Lindbergh Trophies, the Old Court House, "Ol' Man River," Shaw's Garden, the St. Louis Municipal Airport, the Zoological Gardens and many other attractions.

THE PLAZA

Some of the principal public buildings in St. Louis are grouped about a fine plaza, developed after long term planning and made possible by bond issues exceeding \$100,000,000. This most unusual group of new buildings comprises the Municipal Auditorium, the Civil Courts Building, the federal court and custom house, and the \$1,000,000 Soldier Memorial Building; facing the Plaza also are the City Hall and Municipal Courts Build-

ing, the most complete convention building in the world. From the opera house stage, a loud speaker system casts even the weakest voice throughout the building. When the 30 ton fireproof steel curtain between the opera house and the arena is raised, the two enormous areas become one large amphitheater, seating 16,000 people.

No necessary detail for the large assembly was overlooked in the planning of this auditorium. Conveniently woven into the larger pattern are smaller assembly halls with stages, committee rooms, offices, a cafeteria, a refreshment bar, a ticket lobby and a foyer. The entire building is air conditioned. A million cubic feet of fresh air a minute comes into fourteen fan rooms and is conveyed to every part of the building at the rate of 30 cubic feet a minute per person. The opera house seats are richly upholstered over box springs. Audiences and speakers alike enjoy the restfulness that pure air, diffused lighting and dignified furnishings provide.

The Municipal Auditorium is on Market Street between Twelfth Boulevard and Eighteenth Street, three blocks from the Union Depot and within walking distance of many of the best hotels. Ample parking facilities are adjacent. The entrance itself is spacious, with its ticket windows and space for registration booths. A broad stairway leads from both ends to the Grand Lobby, as elegant as a king's palace, with marble columns, gilded ceiling, opal flashed chandeliers, velvet drapes and deep carpets, a restful place indeed to visit with old friends. Four

doors open from the Grand Lobby into a balcony which affords a view of the enormous combined assembly halls.

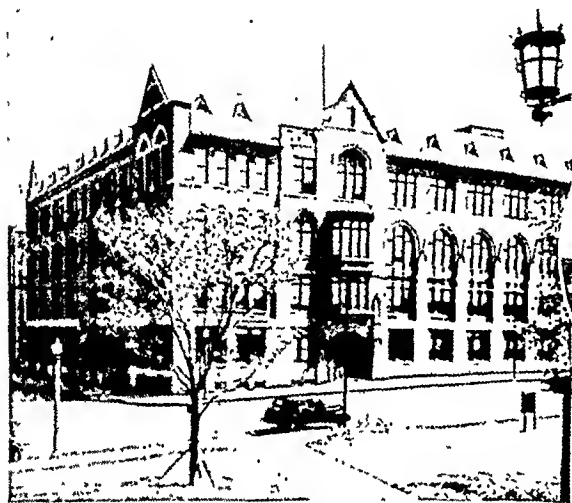
Two of the four smaller assembly rooms are on the third floor, each with a capacity for 800 people. Stairways, elevators and ramps make it easy to reach any of the four floors and the numerous halls and committee rooms. On the ground floor below the convention hall is the Exposition Hall, a spacious area adaptable to almost any type of exhibit.

THE ZOO

Internationally famous is the St. Louis Zoo. Experts come to St. Louis from elsewhere in this country and from abroad to study the unusual arrangements by which animal dens have been transformed into near-to-nature haunts.

Within the zoo's 77 acres in Forest Park are more than 1,964 mammals, birds, fish, reptiles and amphibians. Here are the "eagleless" bear pits, the new monkey house, the largest steel-enclosed bird cage in the world, the swan lakes, which also serve as a sanctuary for wild ducks and geese on their migrations, the new reptile house, and Peacock Valley, with its chain of thirteen lakes teeming with aquatic life.

Steel and concrete structures house lions, tigers, leopards, elephants, hippopotamuses and other creatures.



ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE

THE BOTANICAL GARDEN

The Missouri Botanical Garden (Shaw's Garden), which ranks second only to the famous Kew Gardens of England, contains the largest collection of plant life in the Western Hemisphere. It comprises a city garden of about 75 acres, an out of town extension of more than 1,600 acres, and a tropical extension at Balboa, Panama. More than 11,000 species of plants from all parts of the globe may be seen there.

One of the best botanical libraries in the country, one of the largest herbariums in the United States, laboratories for scientific work and a school for gardening combine the features of a pleasure ground with the facilities of an institution of research. The garden was established by the will of Henry Shaw and is maintained entirely by his endowment. The orchid collection is said to be the finest on the American continent. The garden is open daily to the public, and admission is free.

ST. LOUIS AS A MEDICAL CENTER

While attaining success in industry, St. Louis at the same time has developed into one of the medical centers of the United States, having unusual facilities for the care of the sick, for medical research and for the instruction of medical students at two great medical schools.

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

By the union in 1899 of two medical schools, Washington University School of Medicine was founded. Fifteen years later it moved from Eighteenth and Locust streets to new buildings

at Euclid Avenue and Kingshighway Boulevard, facing Forest Park. Affiliated with it are the Barnes Hospital, St. Louis Children's Hospital, McMillan Eye, Ear, Nose and Throat Hospital, and Osear Johnson Institute. Further teaching facilities are afforded by the St. Louis City Hospital, including the City Isolation Hospital and the City Sanitarium. The Washington University Dispensary serves as an outpatient clinic. Washington University School of Medicine has also museums in the various departments. Recently a collection of anatomic specimens prepared with unusual skill was purchased. Adjoining the main reading room of the excellent library is the famous Beaumont collection of manuscripts, letters and other material of the pioneer American physiologist, presented by his granddaughter, the late Lilly Beaumont Irwin.

ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE

Established in 1837 in a small hospital on Washington Avenue, the St. Louis University School of Medicine ten years later moved to its own building at Seventh and Clark avenues. Eight years later the affiliation between the medical school and the university was severed. The medical school, then independent, was known as the St. Louis Medical College. Beaumont Medical College, organized in 1886, and the Marion Sims School of



WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

Medicine, organized in 1890, combined in 1901 into the Marion Sims-Beaumont Medical College. These medical schools merged in 1901, and in 1903 St. Louis University assumed control of them. The reorganization provided not only full time department heads for the fundamental departments but in 1927 the present group of medical buildings on Compton Hill, at Grand Boulevard and Caroline Street. Here the University Hospital embraces the Firmin Desloge Hospital, St. Mary's Hospital and Mount St. Rose Sanitarium. The educational and medical activities of the Sisters of St. Mary have been placed under the control of the university. Teaching facilities are furnished also by the Alexian Brothers', St. Anthony's and St. John's hospitals, the staffs of which are appointed by the university; associated also are St. Ann's Maternity Hospital, St. Ann's Foundling Society and the St. Louis Obstetric Dispensary. Additional teaching facilities are afforded by the St. Louis City Hospital.

OTHER ST. LOUIS HOSPITALS

In addition to the hospitals connected with the two medical schools, there are the Bethesda General Hospital, Barnard Free Skin and Cancer Hospital, Christian Hospital, De Paul Hospital, Jewish Hospital, Lutheran Hospital, Missouri Baptist Hospital, Missouri Pacific Hospital, St. Louis City Hospital, No. 1, St. Luke's Hospital, St. Ann's Maternity Hospital, Evangelical Deaconess Home and Hospital, Frisco Employees' Hospital, Shriners' Hospital for Crippled Children and the United States Marine Hospital.

THE ST. LOUIS MEDICAL SOCIETY

The St. Louis Medical Society, founded in 1836, now occupies a new, beautiful \$400,000 home at 3839 Lindell Boulevard, constructed especially for the society after months of ceaseless effort by committees and other members to obtain the funds. Here a large lounge offers relaxation from the cares of practice and a congenial spirit for informal conferences. On the walls are tablets for Bernard Farrar, the first president of the society, William Beaumont, president in 1841, and John T. Hodgen, president in 1876. The Bartscher room, a memorial to Dr. Hugh Bartscher from his mother, who left \$41,000 for this purpose, contains historical collections, rare books, medals and art exhibits. The Glasgow reading room is named in honor of Drs. William C. Glasgow and Frank A. Glasgow, whose sister, Mrs. Newton R. Wilson, gave \$50,000 to the building fund. About 300 persons visit this reading room each month. Two librarians are in constant attendance. The library on the second floor contains more than 30,000 volumes and receives 325 current journals. A collection of about 800 rare medical books and pictures, given by the late James M. Ball, is on exhibit. The auditorium will accommodate 700 persons, and there are smaller meeting rooms, a large dining room and rooms for entertainment. The St. Louis Medical Society has 1,000 active members. It publishes a weekly bulletin and has numerous committees studying problems of public welfare and public health as well as economic and scientific problems. It sponsors weekly broadcasts on public health on time allotted through the courtesy of a local broadcasting station.

FOREST PARK

In Forest Park St. Louis has one of the largest fully developed parks in the United States, comprising nearly 1,381 acres, so spacious that natural features may be combined with formal landscaping, artificial lagoons and lakes, fountains and aquatic plants. In addition to the features already briefly described there are three golf courses, twenty-five baseball diamonds, thirty-eight tennis courts and soccer fields, 200 Japanese cherry trees and the city art museum, which was a feature of the Louisiana Purchase Exposition in 1904, at the close of which the \$1,000,000 building was presented to the city.

The Jewel Box, operated in conjunction with the eighteen greenhouses maintained by the park department, is internationally famous for its exhibits of plants and flowers and reproductions of foreign gardens. Last year three new rosariums were created, one in front of the Jewel Box, which when lighted at night shows the splendor of thousands of roses.

The general offices of the Division of Parks and Recreation are in room 330, Municipal Courts Building, Fourteenth and Market streets.

SUMMER OPERA OUTDOORS

St. Louis is known the world over for its summer opera, conducted by the Municipal Theater Association in an open air amphitheater in Forest Park a short distance from the municipal auditorium. This summer will see the twenty-first season. Since 1919 nearly 10,000,000 people have enjoyed 1,374 performances, including five world premiers and four American premiers. Ten thousand seats are available at reasonable prices and there are 1,700 free seats. About 30,000 reserved seats are distributed annually to the underprivileged through more than 100 welfare agencies.

The stage is flanked by two oak trees 70 feet high, beside which are illuminated towers. Almost 1,000 guarantors have invested a total of \$100,000 to insure each season against loss, but never has a guarantor lost a penny. This opera is fully divorced from the old idea that opera must be supported by gifts from the rich or from the state; it is a triumph of democratic ideals. Nature designed the open auditorium and man arranged it so that every one has an unobstructed view. There is parking space for 5,000 automobiles within two minutes' walking distance of the entrance.

JEFFERSON MEMORIAL

Erected as a memorial to Thomas Jefferson by the federal government, the city and the Louisiana Purchase Exposition and standing on the site of the main entrance to the exposition,



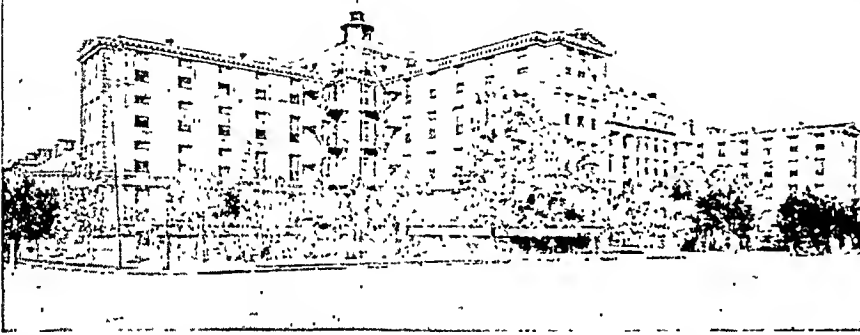
HOME OF ST. LOUIS MEDICAL SOCIETY BUILDING ON LINDELL NEAR VANDEVENTER

Jefferson Memorial is a combination of a museum, library, statue, archway and community center and thus is a fitting monument to one of the most democratic citizens in American history. Of supreme interest is the famous Lindbergh collection. Colonel Lindbergh chose the Jefferson Memorial, with the Missouri Historical Society as custodian, as the permanent resting place of the trophies and mementos which came to him in connection with his flight in the *Spirit of St. Louis* across the Atlantic and his tour of Mexico, Central America and South America. In the memorial also are relics of the Mound Builders, curios of Indian tribes, original manuscripts of the French and Spanish days in Missouri, relics of the pioneers and of the Revolutionary, Mexican, Spanish-American and World wars, ancient records of Missouri courts, the third largest collection of Jefferson manuscripts in the country, a large portion of the manuscripts of the Hamilton-Burr controversy, and records of the Lewis and Clark Expedition.

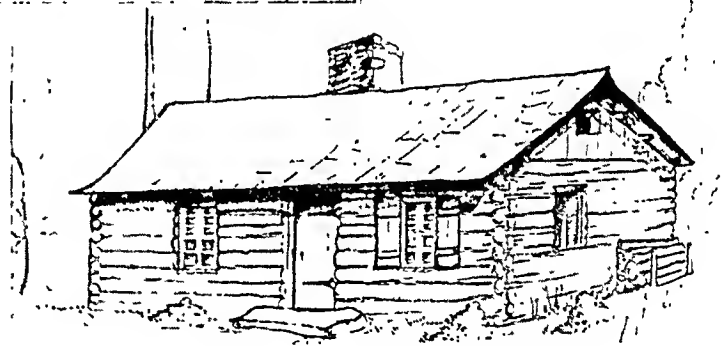
St. Louis Hospitals



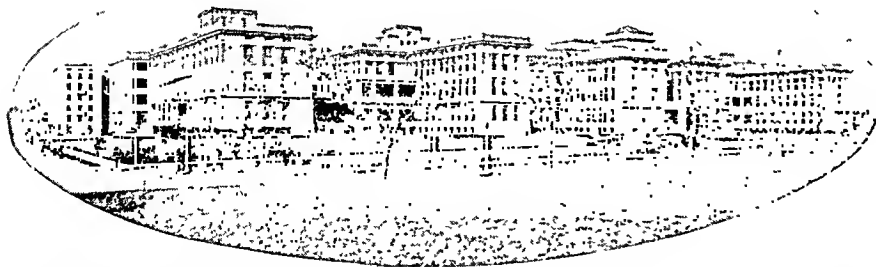
NEW DEACONESS HOSPITAL
AT 6150 OAKLAND AVE., FAC-
ING FOREST PARK



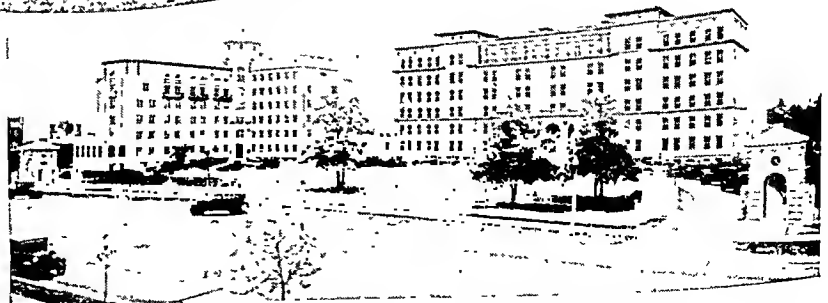
THE CITY HOSPITAL
1515 LAFAYETTE AVE.



ORIGINAL LOG CABIN HOSPITAL,
THE FIRST WEST OF MISSISSIPPI
RIVER

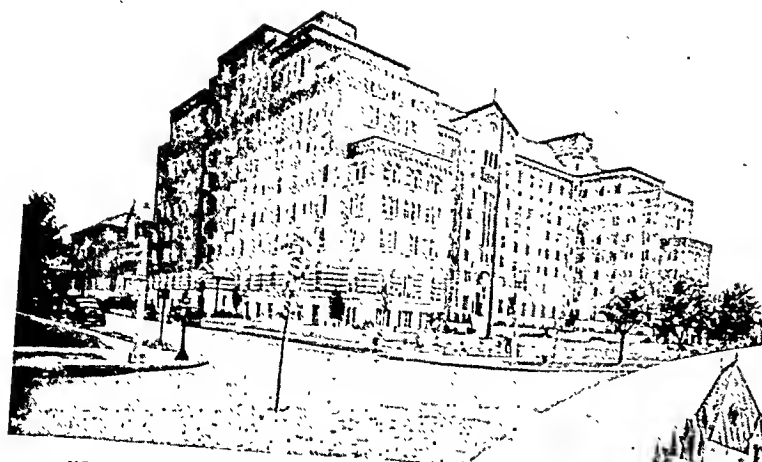


BARNES HOSPITAL GROUP,
KINGSHIGHWAY BLVD. AND
EUCLID AVE., FACING FOR-
EST PARK



ST. MARY'S HOSPITAL AND NURSES' HOME
AT CLAYTON AND BELLEVUE AVE.

THE ST. LOUIS SESSION

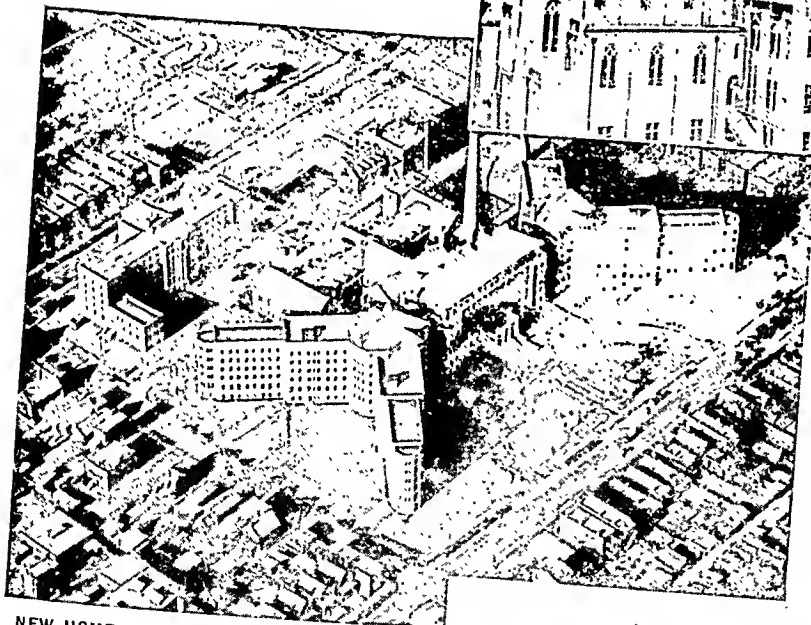


NEW DE PAUL HOSPITAL
2415 KINGSHIGHWAY BLVD.

St. Louis Hospitals



FIRMIN OESLOGE HOSPITAL
1325 S. GRAND BLVD.



NEW HOMER PHILLIPS COLORED HOSPITAL.
ST. LOUIS CITY HOSPITAL FOR COLORED
2601 N. WHITTIER STREET



ST. JOHN'S HOSPITAL, 307 S. EUCLIO AVE.

HISTORICAL LANDMARKS

St. Louis is rich in history, traditions and landmarks of dauntless men. In the Lucas Market Place Ulysses S. Grant once sold cord wood. Here is the home in which he married Julia Dent. At the door of the Old Court House, the scene of the Dread Scott trial, there still stands the auction block on

which slaves were sold. The oldest building in the city is Rock House, on the river front at Chestnut Street, near where the "first thirty" landed in 1764; a few blocks away is the cathedral on the site of which mass was first celebrated in St. Louis. There is the site of the old Government House, where Louisiana territory was transferred from France to the United States, and the home of William Clark, the explorer.

TRANSPORTATION

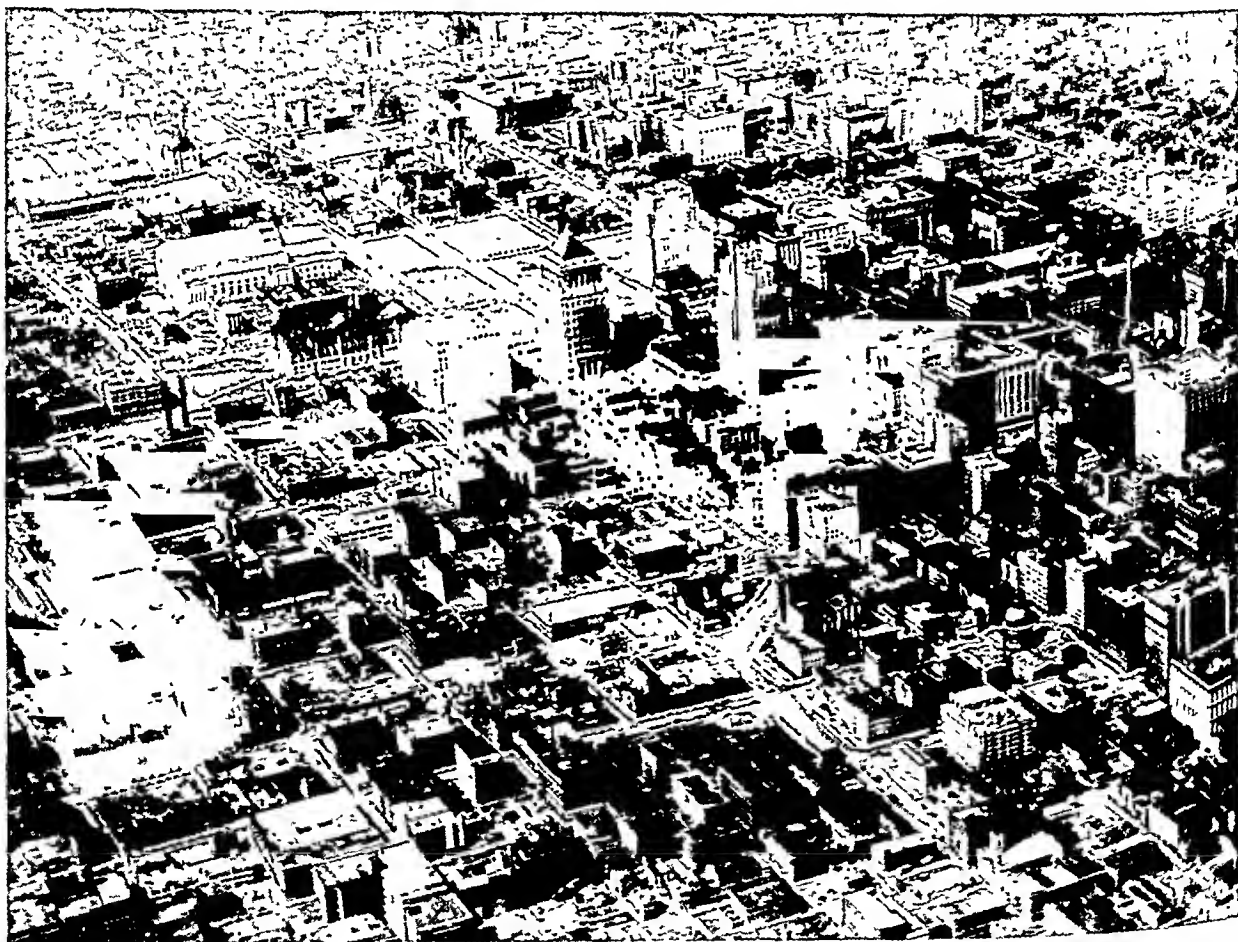
Railroad Rates to St. Louis

Because of the reduction in one way fares effective June 1, 1936, for travel in sleeping and parlor cars, which closely approximates the former convention fare basis, the use of convention fares has been discontinued in the territories of the Central Passenger, Trunk Line, New England, Southern and Southwestern Passenger Associations.

In the territory of the Southern Passenger Association, daily round trip fares are in effect to St. Louis on the basis of 2½

round trip tickets good for transportation in coaches only may be obtained at a fare of 5 per cent less than double the one way 2 cents a mile coach fare, and these tickets have a limit of thirty days in addition to date of sale. These tickets may be obtained without the presentation of credentials.

In the territory of the Trans-Continental and Western Passenger Associations, low round trip fares, for which no certificates of any kind will be necessary, will be in effect daily for travel in sleeping and parlor cars, on payment of the



AIR VIEW OF DOWNTOWN ST. LOUIS

cents a mile in each direction with limit of six months in addition to date of sale going and returning the same route, also via diverse routes, tickets being honored in sleeping or parlor cars on payment of charges for space occupied. In addition, reduced fares are in effect on a slightly lower basis from certain points in the extreme western part of the territory to St. Louis for tickets bearing limit of thirty days in addition to date of sale. These fares are subject to change but in all probability these or comparable fares will be available.

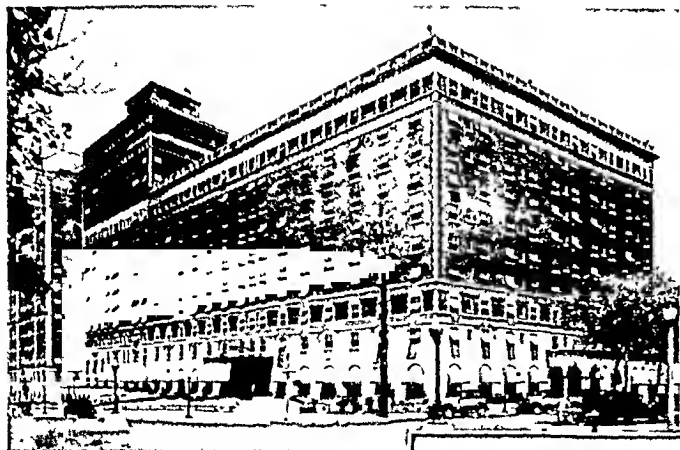
In the territory of the Southwestern Passenger Association, for travel in sleeping or parlor cars, thirty day limit fares are on the basis of fare and one half or 2¼ cents a mile in each direction. In case a longer limit than thirty days is desired, tickets at slightly higher fares are available. In addition,

usual charges for space occupied. Low intermediate class fares, good for transportation in tourist sleeping cars, will also be available on payment of charges for space occupied.

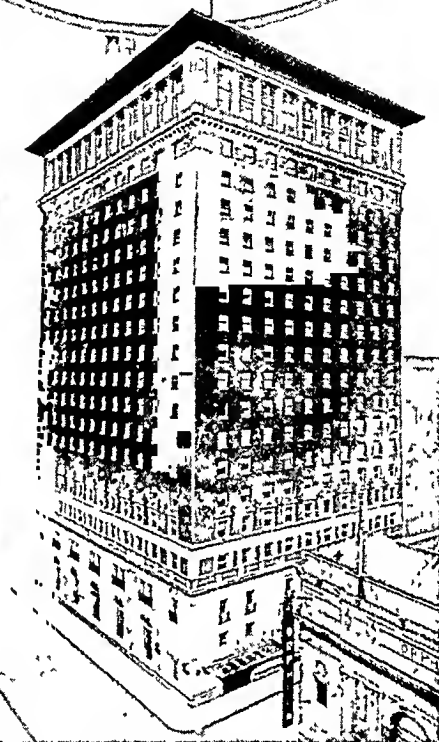
All members who expect to attend the session are urged to confer with their home ticket agents, who will be able to give them more specific information regarding fares and routes.

Air Travel

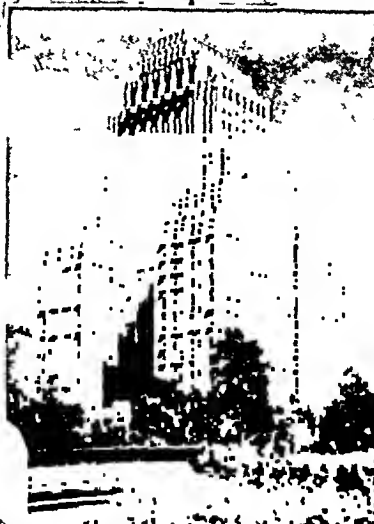
By air, St. Louis is just a few hours from most important cities in the United States, Canada and Mexico, and no more than overnight from the most distant. Sleeper accommodations are available on overnight journeys on most of the transcontinental services. Your nearest Airline Ticket Office, Travel Bureau, Hotel Transportation Desk or Western Union or Postal Telegraph Office will gladly arrange your itinerary.



CORONADO HOTEL



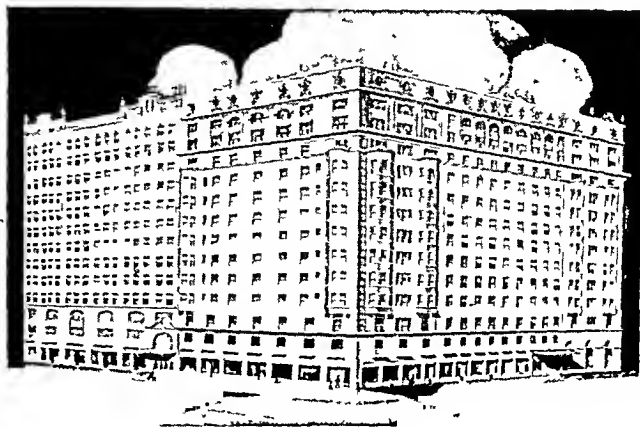
HOTEL STATLER



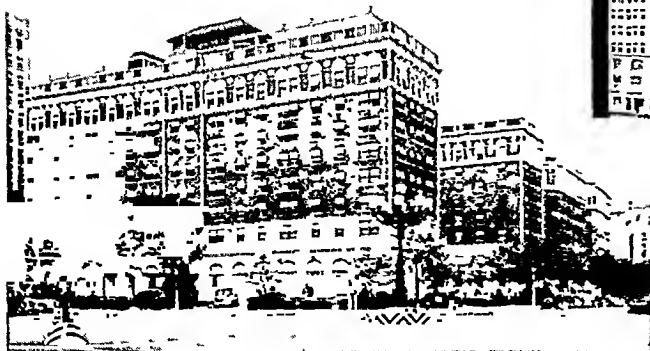
PARK PLAZA HOTEL



HOTEL MARQUETTE



JEFFERSON HOTEL



HOTEL CHASE

REGISTRATION

The Bureau of Registration will be located in the Municipal Auditorium, Market Street, between Fourteenth and Fifteenth streets. Members of the Subcommittee on Registration of the Local Committee on Arrangements will be on hand to assist those who desire to register. A branch postoffice in charge of government postoffice officials will be available for visitors, and an information bureau will be operated in connection with the Bureau of Registration.

Who May Register

Only Fellows, Affiliate, Associate and Honorary Fellows and Invited Guests may register and take part in the work of the sections. Fellows of the Scientific Assembly are those who have, on the prescribed form, applied for Fellowship, subscribed to *THE JOURNAL* and paid their Fellowship dues for the current year. The annual Fellowship dues provide a subscription to *THE JOURNAL* for one year. Fellowship cards are sent to all Fellows after payment of annual dues, and these cards should be presented at the registration window. Any

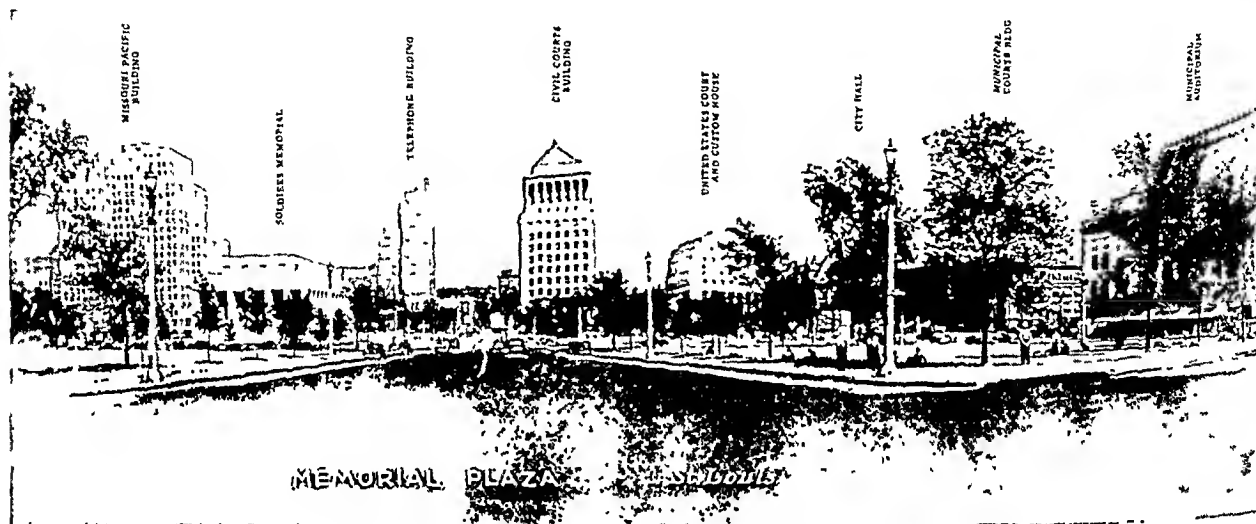
Suggestions That Will Facilitate Registration

Fellows should fill out completely the spaces on both sections of the front of the *white* registration card, which will be found on the tables in front of the Registration Bureau.

Physicians who desire to qualify as Fellows should fill out completely the spaces on both sections of the front of the *blue* registration card and sign the application on the back. These cards will be found on the tables.

Entries on the registration cards should be written plainly or printed, as the cards are given to the printer to use as "copy" for the *Daily Bulletin*, published on Tuesday, Wednesday, Thursday and Friday of the week of the session.

Fellows who have their pocket cards with them can be registered with little or no delay. They should present the filled out *white* registration card, together with their pocket cards, at one of the windows marked "Registration by Pocket Card." There the clerk will compare the two cards, stamp the pocket card and return it, and supply the Fellow with a badge, a copy of the official program and other printed matter of interest to those attending the annual session.



THE MUNICIPAL AUDITORIUM IS ON THE RIGHT

who have not received cards for 1939 should secure them at once by writing to the American Medical Association, 535 North Dearborn Street, Chicago.

Members in Good Standing Eligible to Apply for Fellowship in the Association

Members in good standing in component county medical societies are members of constituent state associations and of the American Medical Association. All members in good standing may apply for Fellowship in the Scientific Assembly and are urged to qualify as Fellows before leaving home in order that pocket cards may be secured and brought to St. Louis so that registration can be more easily and more promptly effected.

Application forms may be had on request.

Those subscribers to *THE JOURNAL* who have not received pocket cards for 1939 should write to the American Medical Association in order to obtain application blanks and information as to further requirements.

Register Early

Fellows living in St. Louis, as well as all other Fellows who are in St. Louis on Monday and Tuesday, should register as early as possible. The names of those who register will be included in the issue of the *Daily Bulletin* appearing the next day, and this will enable visiting physicians to find friends if they have registered.

As previously stated, it will assist in registering if those who desire to qualify as Fellows will file their applications and qualify as Fellows by writing directly to the American Medical Association, 535 North Dearborn Street, Chicago, so that their Fellowship may be entered not later than April 24. Any applications that are received later than April 24 will be given prompt attention, but the Fellowship pocket card may not reach the applicant in time for him to register at the St. Louis session.

It will be possible for members of the organization to qualify as Fellows at St. Louis. In order to do this, applicants for Fellowship will be required to fill out both sections of the front of the *blue* registration card and to sign the formal application that is printed on the reverse side of the card. It is suggested that those members who apply for Fellowship at St. Louis bring with them their state membership cards for 1939. The state membership card should be presented along with the filled in *blue* registration card at the window in the booth marked "Applicants for Fellowship and Invited Guests."

As already stated, registration can be effected more easily and more promptly if members will qualify as Fellows before leaving home.

Registration for General Officers and Delegates at the Hotel Statler

General Officers of the American Medical Association and members of the House of Delegates may register for the Scientific Assembly in Section III of the Assembly Room, adjacent to the Ball Room of the Hotel Statler. This arrangement is

made for the convenience of the members of the House of Delegates, which will convene on Monday morning at 10 o'clock in the Ball Room of the Hotel Statler. Delegates are requested to register for the Scientific Assembly before presenting credentials to the Reference Committee on Credentials of the

House of Delegates. Registration of delegates for the Scientific Assembly will begin at 8 o'clock, Monday morning, May 15, and delegates are urged to register early so that all members of the House of Delegates may be seated in time for the opening session of the House.

ST. LOUIS HOTELS

A list of St. Louis hotels is presented for the benefit of those who expect to attend the annual session of the American Medical Association, May 15-19. Dr. Neil S. Moore is chairman of the Subcommittee on Hotels of the Local Committee

be accepted by some of the hotels named in the list, but the chairman of the subcommittee on hotels will use his utmost endeavor to secure satisfactory accommodations for all who may apply. Since all reservations are cleared through the

Schedule of Rates

Hotels	For 1 Person	For 2 Persons		Suites	Hotels	For 1 Person	For 2 Persons		Suites
		Double Bed	Twin Beds				Double Bed	Twin Beds	
AMERICAN 6 N. 7th St.....	\$2.00	\$3.00	\$4.00		LINDELL PLAZA 4300 Lindell....		2.50- 3.00	3.00- 3.50	
AUDITORIUM 1803 Pine St.....		3.50	4.50		MAJESTIC 200 N. 11th St...	2.00- 3.00	3.00- 4.50	4.00- 5.00	
BELCHER BATH 407 Lucas St.....		2.50	3.00		MARK TWAIN 116 N. 8th St.....		4.00- 5.00	4.50- 6.00	
BILTMORE 3648 Washington Ave...		3.00	3.50		MARQUETTE 18th and Washington.....		2.50- 3.50	3.00- 4.00	
CHASE 212 N. Kingshighway...	3.00- 5.00	4.50- 6.00	5.00- 8.00		MARYLAND 205 N. 9th St.....		3.00- 5.00		
CLARIDGE 18th and Loenst.....		3.00- 6.00	4.00- 7.00		MAYFAIR 8th and St. Charles St.....	3.00	5.00- 6.00	5.50- 8.00	
CONGRESS 275 N. Union Blvd.....			6.00	\$11.00-\$13.00	MELBOURNE 3601 Lindell Blvd...	2.50- 4.00	4.00- 6.00	4.50- 7.00	
CORONADO 3701 Lindell Blvd.....	2.00- 5.00	4.50- 6.00	5.00- 7.00	7.00- 12.00	PARKEDGE 4907 West Pine...		2.00- 2.50		
DESOTO 1014 Locust St.....	2.50- 4.00	4.00- 6.00	5.00- 7.00		PARK MANOR 3560 Pershing.....		2.00- 2.50		
FAIRGROUNDS 3644 Natural Bridge...		4.00- 5.00			PARK PLAZA 220 N. Kingshighway.....	3.50- 4.00	6.00- 7.00	8.00-10.00	
FOREST PARK 4910 West Pine.....			5.00	5.00- 10.00	ROOSEVELT 4601 Delmar.....		3.00		
GATESWORTH 245 Union Blvd.....		4.00	4.00- 5.00	10.00- 15.00	STATLER 9th and Washington.....	2.50	4.50- 7.00	5.00- 9.00	12.00
JEFFERSON 415 N. 12th Blvd.....	2.50- 6.00	3.50- 8.00	5.00- 8.00	6.00- 19.50	WARWICK 1428 Loenst.....	2.00- 3.00	3.00- 4.00	4.00- 5.00	
KINGS-WAY 108 N. Kingshighway...	1.50- 4.00	2.50- 6.00	4.00- 7.00		WASHINGTON 610 N. Kingshighway.....		2.00- 3.00	2.50- 3.50	
LENNOX 825 Washington Ave.....	3.50- 6.00	5.00- 8.00	5.50- 8.00		YORK 8 S. 6th St.....	2.00- 2.50	4.00	4.70	

on Arrangements and may be addressed at 910 Syndicate Trust Building, St. Louis, Mo. The advertising announcement and coupon for reservations appear on advertising page 107 of this issue. It is quite probable that no further reservations can

subcommittee on hotels, it will greatly expedite matters if requests for reservations are addressed directly to Dr. Moore, who, as stated, may be reached at 910 Syndicate Trust Building, St. Louis, Mo.

MEETING PLACES

HOUSE OF DELEGATES: Ball Room of the Hotel Statler, Washington Avenue at Ninth and St. Charles streets.

OPENING GENERAL MEETING: Opera House of Municipal Auditorium.

GENERAL SCIENTIFIC MEETINGS: Opera House of Municipal Auditorium and Gold Room of Hotel Jefferson.

SECTIONS OF SCIENTIFIC ASSEMBLY

PRACTICE OF MEDICINE: Gold Room of Hotel Jefferson.

SURGERY, GENERAL AND ABDOMINAL: Opera House of Municipal Auditorium.

OBSTETRICS AND GYNECOLOGY: Opera House of Municipal Auditorium.

OPHTHALMOLOGY: Assembly Room 1 of Municipal Auditorium.

LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY: Assembly Room 1 of Municipal Auditorium.

PEDIATRICS: Gold Room of Hotel Jefferson.

PHARMACOLOGY AND THERAPEUTICS: Assembly Room 2 of Municipal Auditorium.

PATHOLOGY AND PHYSIOLOGY: Assembly Room 2 of Municipal Auditorium.

NERVOUS AND MENTAL DISEASES: Assembly Room 4 of Municipal Auditorium.

DERMATOLOGY AND SYPHILOLOGY: Assembly Room 3 of Municipal Auditorium.

PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH: Ivory Room of Hotel Jefferson.

UROLOGY: Assembly Room 3 of Municipal Auditorium.

ORTHOPEDIC SURGERY: Assembly Room 4 of Municipal Auditorium.

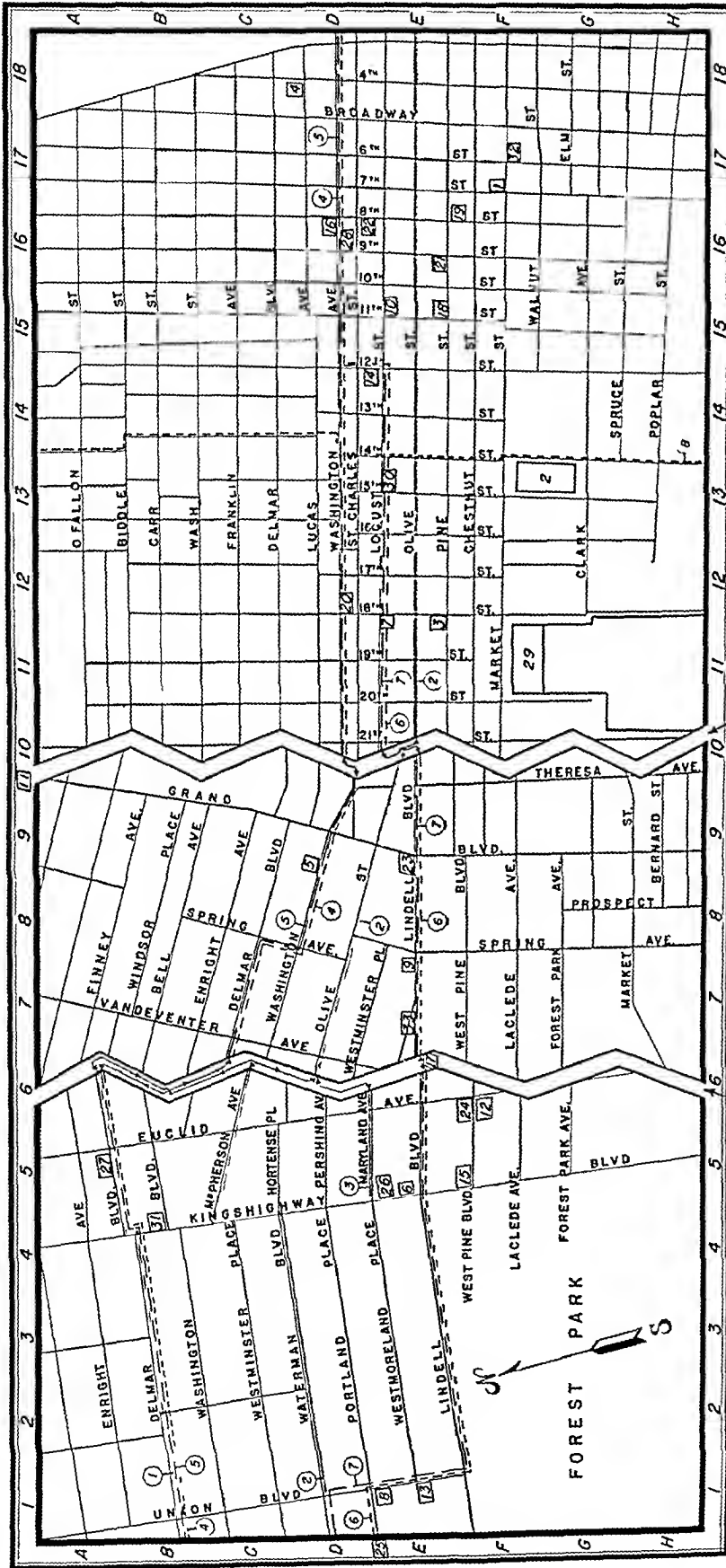
GASTRO-ENTEROLOGY AND PROCTOLOGY: Ivory Room of Hotel Jefferson.

RADIOLOGY: Ball Room of Hotel DeSoto.

MISCELLANEOUS TOPICS, SESSION ON ANESTHESIA: Ball Room of Hotel DeSoto.

GENERAL HEADQUARTERS, SCIENTIFIC EXHIBIT, REGISTRATION BUREAU, TECHNICAL EXHIBITS, INFORMATION BUREAU AND BRANCH POSTOFFICE: Municipal Auditorium, Market Street, between Fourteenth and Fifteenth streets.

MAP OF ST. LOUIS AND KEY TO MAP



- ① DELMAR - OLIVE STREET CAR
- ② UNIVERSITY - OLIVE STREET CAR
- ③ MARYLAND - OLIVE STREET CAR
- ④ DELMAR SERVICE CAR ROUTE 1

ABOUT 1/2 MILES OF AREA BETWEEN PART OF EUCLID AVE AND PART OF WASHINGTON AVE OMITTED... LINDLELL PLAZA HOTEL LOCATED ABOUT MIDWAY IN THIS AREA ON LINDLELL BLVD

ABOUT 1/2 MILES OF AREA BETWEEN PART OF THERESA AVE AND 25th ST OMITTED

- ⑤ DELMAR BUS #91
- ⑥ LINDLELL BUS #93
- ⑦ LINDLELL-WATERMAN SERVICE CAR ROUTE 3
- ⑧ CHEROKEE BUS #20

ST. LOUIS, MISSOURI
SHOWING THE PRINCIPAL HOTEL AREAS

KEY TO MAP

1 American Hotel	I 17	8 Congress Hotel	D 1	15 Kings Way Hotel	I-5	22 Mayfair Hotel	D 16	28 Strider Hotel	D 16
2 Auditorium (Municipal)	I 13	9 Coronado Hotel	E 7	16 Lennox Hotel	D 16	23 Melbourne Hotel	I 9	29 Union Station	I 11
3 Auditorium Hotel	I 11	10 DeSoto Hotel	E 15	17 Lindell Plaza Hotel	E 6	24 Parkridge Hotel	I 6	30 Warwick Hotel	E 13
4 Belcher Brth Hotel	D 18	11 Fairgrounds Hotel	Margen 10	18 Mayette Hotel	I 15	25 Park Manor Hotel	Margen 12	31 Washington Hotel	H 4
5 Baltimore Hotel	D 9	12 Forest Park Hotel	I 6	19 Mark Twain Hotel	I 16	26 Park Plaza Hotel	I 16	32 York Hotel	I 17
6 Chace Hotel	E 5	13 Gatesworth Hotel	E 1	20 Marquette Hotel	D 12	27 Roosevelt Hotel	I 5	33 St Louis Medical Society	I 7
7 Churche Hotel	E 12	14 Jefferson Hotel	D 14	21 Maryland Hotel	I 16				

GENERAL SCIENTIFIC MEETINGS

MONDAY, MAY 15—2 P. M.

OPERA HOUSE, MUNICIPAL AUDITORIUM
PROGRAM BY ST. LOUIS PHYSICIANS

Emergency Treatment of Heart Failure.

ALPHONSE McMAHON.

A Comparison of the St. Louis Type of Encephalitis with Other Neurotropic Virus Diseases. G. O. BROWN.

Operative Procedures on the Sympathetic Nervous System.

WILLIAM T. COUGHLIN.

Primary Carcinoma of the Lung.

M. F. ARBUCKLE and EVARTS A. GRAHAM.

Use of the Polysaccharide Skin Test in the Serum Treatment of Lobar Pneumonia.

L. D. THOMPSON, JOSEPH EDWARDS and C. L. HOAGLAND.

Electrical Transcriptions of Speech Following Closure and Elongation of Cleft Palates. JAMES BARRETT BROWN.

Roentgen Aids in Chest Diagnosis. L. R. SANTE.

TUESDAY, MAY 16

MEDICAL DIVISION: GOLD ROOM OF THE HOTEL JEFFERSON
9 A. M.

Allergy and Dermatology.

MARION B. SULZBERGER, New York.

The Treatment of Insomnia. LOUIS J. KARNOSH, Cleveland.

Focal Infections and Systemic Disease: A Critical Appraisal. HOBART A. REIMANN and W. PAUL HAVENS, Philadelphia.

The Autonomic Nervous System and Experimental Cardiovascular Disease. G. E. HALL, Toronto, Canada.

Diagnosis and Treatment of Pellagra, Beriberi and Flavin Deficiency (Lantern Demonstration).

TOM D. SPIES, Cincinnati.

Obliterative Arterial Disease of the Lower Extremities: Diagnosis and Principles of Treatment (Lantern Demonstration).

LELAND S. MCKITTRICK, Boston.

2 P. M.

PANEL DISCUSSION ON PNEUMONIA

Each speaker is limited to fifteen minutes. Following the presentation of papers there will be a discussion based on questions submitted from the audience. Each question will be referred to one of the speakers for answer.

ERNEST E. IRONS, Moderator, Chicago

Pneumonia as a Public Health Problem: Geographic Distribution of Types; State Programs.

ADOLPH S. RUMREICH, Washington, D. C.

Etiology, Experimental and General; Pathology (Infection; Mechanism of Invasion; Bacteremia, Variations, Types, Significance in Relation to Therapy).

O. H. ROBERTSON, Chicago.

Serum Therapy: Types; Type Serums; Standardization; Clinical Results. JESSE G. M. BULLOWA, New York.

Chemotherapy (Brief Historical Outline); Ethylhydrocupreine; Sulfanilamide; Sulfapyridine; Comparison with Serum Therapy. COLIN M. MACLEOD, New York.

Oxygen Therapy: Indications and Methods of Application; Relation to Other Therapy.

M. A. BLANKENHORN, Cincinnati.

General Therapy; Use of Specific Therapies Combined with Individualized Care of Patient; Heart Complications; Pneumonia as a Major Emergency.

ROGER I. LEE, Boston.

TUESDAY, MAY 16

SURGICAL DIVISION: OPERA HOUSE OF MUNICIPAL AUDITORIUM
9 A. M.

Surgical Treatment of Peptic Ulcer (Lantern and Motion Picture Demonstration).

WILLIAM F. RIENHOFF JR., Baltimore.

Progress in the Treatment of Patients with Severe Burns (Motion Picture Demonstration).

ROY D. McCLURE, Detroit.

The Treatment of Peritonitis (Lantern Demonstration).

THOMAS G. ORR, Kansas City, Mo.

Diseases of the Heart and Pericardium in Which Surgical Therapy May Be Indicated (Lantern and Motion Picture Demonstration). ALFRED BLALOCK, Nashville, Tenn.

Surgical Aspects of Carcinoma of the Stomach.

ALFRED J. BROWN, Omaha.

The Automobile and the Fractured Spine (Lantern Demonstration). H. EARLE CONWELL, Birmingham, Ala.

2 P. M.

PANEL DISCUSSION ON BILIARY TRACT DISEASE

Each speaker is limited to twenty minutes. Following the presentation of papers there will be a discussion based on questions submitted from the audience. Each question will be referred to one of the speakers for answer.

FRANK H. LAHEY, Moderator, Boston

Physiology of the Biliary Tract. ANDREW C. IVY, Chicago.

Differential Diagnosis of Jaundice.

I. S. RAVDIN, Philadelphia.

The Bleeding Tendency in Jaundice.

JOHN G. MATEER, Detroit.

Acute Cholecystitis.

H. W. CAVE, New York.

Strictures and Injuries to Bile Ducts.

WALTMAN WALTERS, Rochester, Minn.

Common and Hepatic Duct Stones.

FRANK H. LAHEY, Boston.

SYMPOSIUM ON HEALTH PROBLEMS IN EDUCATION

A third Symposium on Health Problems in Education, under the sponsorship of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, together with the Section on Pediatrics, the Section on Preventive and Industrial Medicine and Public Health, the Section on Ophthalmology and the Section on Laryngology, Otology and Rhinology of the American Medical Association, will be held in Assembly Room 1, Municipal Auditorium, St. Louis, May 16, at 2 p. m. Dr. S. Judd Beach, Portland, Maine, will preside. The following program will be presented:

Symposium on School Health Policies

School Health Problems:

From the Point of View of a School Physician.

J. H. HUMPHREY, St. Louis.

From the Point of View of a School Administrator.

HENRY J. GERLING, St. Louis.

From the Point of View of a Practicing Physician.

WINGATE M. JOHNSON, Winston-Salem, N. C.

From the Point of View of a Physical Educator.

N. P. NELSON, Washington, D. C.

The Tuberculosis Problem in the Schools.

CAMILLE KERESZTURI, New York.

The Status of Health Education in the Schools.

LOYD W. KING, Jefferson City, Mo.

Community Participation in a Health Program.

T. R. MEYER, Clayton, Mo.

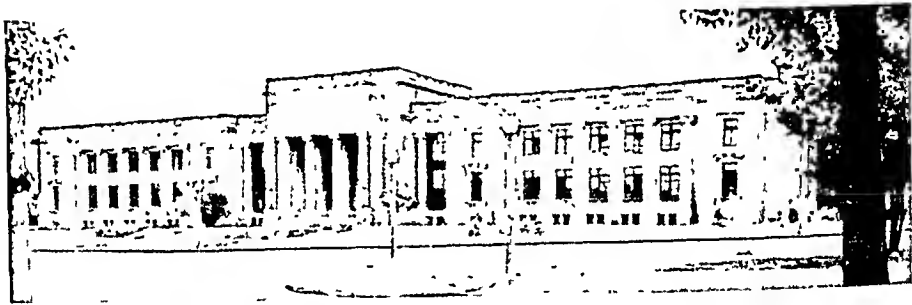


ART MUSEUM IN FOREST PARK

Museums and the New Armory



NEW ARMORY AT SPRING AND MARKET STREETS



JEFFERSON MEMORIAL IN FOREST PARK

LOCAL COMMITTEE ON ARRANGEMENTS

Executive Committee

ROBERT E. SCHLUETER, Chairman

ALPHONSE MCMAHON, Vice Chairman

JAMES L. MUDD, Secretary

PERCY H. SWAHLEN, Treasurer

Honorary Vice Chairmen: ALPHONSE M. SCHWITALLA and PHILIP A. SHAFFER.

Advisory Committee: WILLARD BARTLETT, LOUIS H. BEHRENS, LOUIS C. BOISLINIERE, M. B. CLOPTON, MAX A. GOLDSTEIN, EDWARD J. GOODWIN, W. W. GRAVES, JOSEPH GRINDON, HERMAN A. HANSER, BRANSFORD LEWIS, CHARLES H. NEILSON, ELSWORTH SMITH, MEYER WIENER.

Subcommittees

Subcommittee on Sections and Section Work: Llewellyn Sale, Chairman.

Practice of Medicine: Augustus P. Munsch, Chairman.

Surgery, General and Abdominal: Arthur O. Fisher, Chairman.

Obstetrics and Gynecology: Solomon A. Weintraub, Chairman.

Ophthalmology: M. Hayward Post, Chairman

Laryngology, Otology and Rhinology: James B. Costen, Chairman.

Pediatrics: Julius A. Rossen, Chairman.

Pharmacology and Therapeutics: Lee Pettit Gay, Chairman

Pathology and Physiology: Downey L. Harris, Chairman

Nervous and Mental Diseases: Hillel Unterberg, Chairman

Dermatology and Syphilology: Garold V. Stryker, Chairman

Preventive and Industrial Medicine and Public Health: Joseph F. Bredeck, Chairman.

Urology: Dalton Keats Rose, Chairman.

Orthopedic Surgery: J. Albert Key, Chairman.

Gastro-Enterology and Proctology: Joseph W. Larimore, Chairman.

Radiology: L. R. Sante, Chairman.

Miscellaneous Topics, Session on Anesthesia: Alexander J. Kotkis, Chairman.

Subcommittee on Registration: Henry P. Thym, Chairman, Paul F. Fletcher, Vice Chairman; John A. Barger, Secretary.

Subcommittee on Fellowship: Lee D. Cady, Chairman.

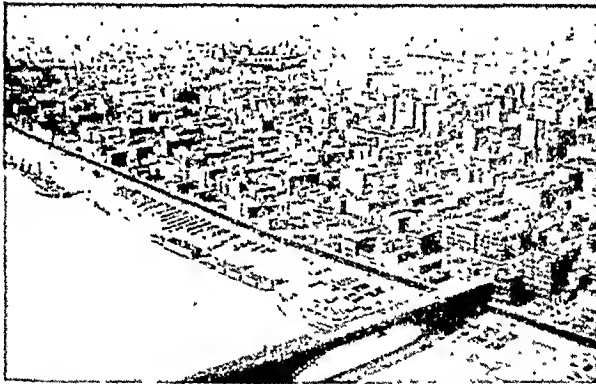
Subcommittee on Technical Exhibits: E. P. Buddy, Chairman.
Subcommittee on Scientific Exhibit: James B. Brown, Chairman; E. L. Keyes, Vice Chairman.
Subcommittee on Hotels: Neil S. Moore, Chairman; H. H. Kramolowsky, Vice Chairman; Roy E. Mason, Secretary.
Subcommittee on Printing: Charles H. Eyermann, Chairman; Vincent L. Jones, Vice Chairman; William G. Becke, Secretary.
Subcommittee on Badges: Frederick C. E. Kuhlmann, Chairman; William E. Holdenried, Secretary.
Subcommittee on Publicity: Phelps G. Hurford, Chairman; R. O. Muehler, Vice Chairman; Solon Cameron, Secretary.
Subcommittee on Finance: Curtis H. Lohr, Chairman.
Subcommittee on Women Physicians: Emma Phelan, Chairman; Katherine M. Schaaf, Vice Chairman.
Subcommittee on Clinics: Frederick A. Jostes, Chairman.
Subcommittee on Transportation: Robert F. Hyland, Chairman.

Subcommittee on Entertainment: R. Emmet Kane, Chairman; William E. Leighton, Vice Chairman; Jerome I. Simon, Secretary.
Opening General Meeting: Carl F. Vohs, Chairman; Victor E. Hrdlicka, Vice Chairman; Dean Sauer, Secretary.
President's Reception and Ball: Cyrus E. Burford, Chairman; William H. Vogt, Vice Chairman; Charles E. Hyndman, Secretary.
Foreign Guests: Walter Baumgarten, Chairman; Ralph A. Kinsella, Vice Chairman.
Alumni and Fraternity Reunions: Theodore P. Brookes, Chairman; Herbert S. Langsdorf, Vice Chairman; Thomas M. Martin, Secretary.
Golf: Grayson Carroll, Chairman; Charles E. Eimer, Secretary.
Women's Activities: Mrs. Willard Bartlett, Chairman; Mrs. David P. Barr, Mrs. O. P. J. Falk, Mrs. E. Horace Johnson and Mrs. Alexander J. Kotkis, Vice Chairmen.

ENTERTAINMENT

Dinner for Delegates

A dinner and entertainment is being arranged for Monday, May 15, 6:45 p. m., in the Ball Room of the Hotel Statler for members of the House of Delegates and officers of the American Medical Association. The features of this dinner will be so unique that no delegate or officer should be absent or late.



RIVER, RAIL AND PLANE, THREE MODES OF TRAVEL
TO ST. LOUIS

Luncheon for Delegates

A luncheon for the officers and the members of the House of Delegates of the American Medical Association is being planned for Tuesday noon, May 16, between the morning and afternoon sessions of the House of Delegates at the Hotel Statler.

Opening General Meeting

The Opening General Meeting will be held on Tuesday evening, May 16, in the Opera House of the Municipal Auditorium. The program will begin at 8 o'clock.

President's Reception and Ball

The President of the American Medical Association will be honored with a reception and ball to be held Thursday evening, May 18, at 9 o'clock at the Hotel Jefferson.

Alumni and Group Dinners

Notice has been received of the following alumni and group dinners and smokers to be held during the time of the session:

ALPHA OMEGA ALPHA, Thursday, May 18, 6:30 p. m., at the Hotel Jefferson. Dr. Ludvig Hektoen will present the William W. Root lecture. Adjourn promptly at 9 p. m. for President's Reception.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY, Wednesday, May 17, 7 p. m., in the Tower Room of the Hotel Congress. Informal. Price, \$2.50. Tickets may be purchased at the Banquet ticket booth in the Municipal Auditorium. Dr. Robin C. Bucrki will be the guest speaker.

CREIGHTON UNIVERSITY SCHOOL OF MEDICINE ALUMNI, Wednesday, May 17, 7:30 p. m., in the Crystal Room of the Hotel Coronado.

HARVARD UNIVERSITY MEDICAL SCHOOL ALUMNI, Wednesday, May 17, 7:30 p. m., at the University Club.

MISSOURI MEDICAL COLLEGE, Class of 1894, Table at Washington University Medical School Alumni Banquet, Wednesday, May 17, in the Gold Room of the Hotel Jefferson.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL ALUMNI, Wednesday, May 17.

RUSH MEDICAL COLLEGE, UNIVERSITY OF CHICAGO, ALUMNI, Wednesday, May 17, 7 p. m., at the Hotel Statler. Reservations: Dr. Austin A. Hayden, Hotel Statler, St. Louis.

SECTION ON GASTRO-ENTEROLOGY AND PROCTOLOGY, Thursday, May 18, 6:30 p. m., in the Crystal Room of the Hotel Jefferson.

SECTION ON PRACTICE OF MEDICINE, Wednesday, May 17, at the University Club.



TYPICAL ST. LOUIS RESIDENCE

ST. LOUIS UNIVERSITY, Class of 1915, Tuesday, May 16, 7:30 p. m., at the Hotel DeSoto.

ST. LOUIS UNIVERSITY MEDICAL SCHOOL ALUMNI, Wednesday, May 17, 7 p. m., at the Missouri Athletic Association.

ST. LUKE'S HOSPITAL FORMER INTERNS, Tuesday, May 16, 7 p. m., at St. Luke's Hospital.

UNIVERSITY OF LOUISVILLE ALUMNI, Wednesday, May 17, 6:30 p. m., at the Hotel Melbourne. Dr. Raymond A. Kent will deliver the principal address.

WASHINGTON UNIVERSITY MEDICAL SCHOOL ALUMNI, Wednesday, May 17, 7 p. m., in the Gold Room of the Hotel Jefferson.

Fraternity and Club Luncheons

Notice has been received of the following fraternity and club luncheons:

ALPHA KAPPA KAPPA FRATERNITY, Wednesday, May 17, 12:30 p. m., at the Missouri Athletic Association.

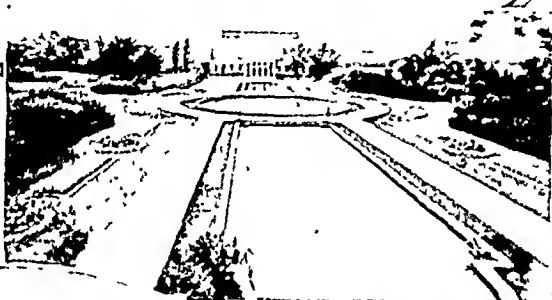
ALPHA MU PI OMEGA MEDICAL FRATERNITY, Wednesday, May 17, 12:30 p. m., at the University Club.

will be accepted for this art show in the following classifications: (1) oils, both (a) portrait and (b) landscape; (2) water colors; (3) sculpture; (4) photographic art; (5) etchings; (6) ceramics; (7) pastels; (8) charcoal drawings; (9) book binding; (10) wood carving; (11) metal work (jewelry). There will be more than sixty valuable prize awards.

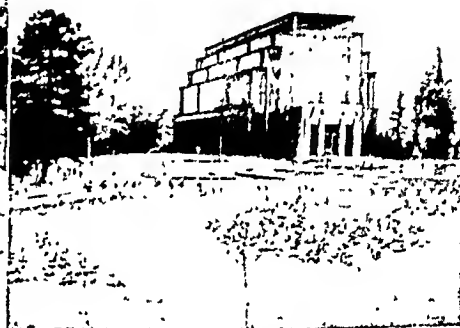
The William Beaumont Exhibit and the Exhibit of Medals

Many visitors to St. Louis during the annual session of the American Medical Association will be interested in the collection of letters and notebooks relating to Dr. William Beaumont, the pioneer American physiologist, who served in St. Louis as an army surgeon and later became a busy prac-

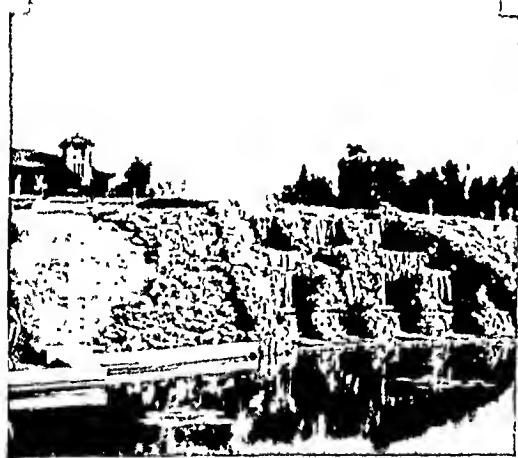
Views in Forest Park



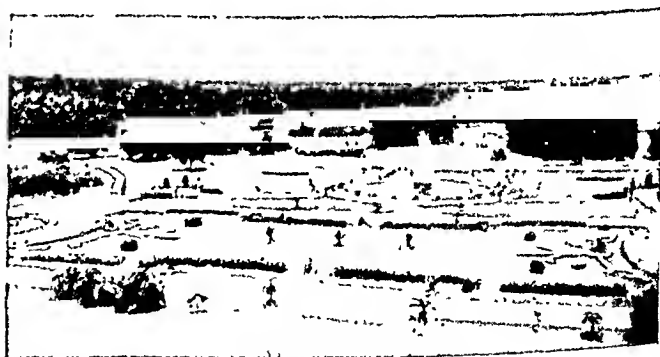
SHAW'S GARDEN



THE JEWEL BOX



FOUNTAIN, CASCADE AND LILY POND



FOUNTAIN AND GARDENS

ASSOCIATED DIPLOMATS OF THE NATIONAL BOARD OF MEDICAL EXAMINERS, Wednesday, May 17, 12 m., at the Hotel Mayfair.

NEW YORK EYE AND EAR INFIRMARY ALUMNI, Wednesday, May 17, 1 p. m., at the Hotel Park Plaza.

PHI BETA PI, Wednesday, May 17, at the Hotel DeSoto.

Mississippi Steamboat Trip

There will be a steamboat trip on the Mississippi River for all interested from 12:30 to 3:30 p. m., Thursday, May 18. Price, \$1. Usual light refreshments will be available at reasonable prices.

American Physicians' Art Association

The American Physicians' Art Association will hold its second art exhibition in the Museum of Art, St. Louis, May 14-20. The headquarters of the Art Association in St. Louis will be in booth 15A of the Municipal Auditorium. Art pieces

of medicine in St. Louis. Dr. Beaumont was one of the early presidents of the St. Louis Medical Society. The most important scientific collection of Beaumontiana in existence can be seen at the Library of Washington University School of Medicine, Euclid Avenue and Kingshighway.

At the Library of the St. Louis Medical Society will be a display of medals, plaquettes and coins in the Hugo W. Bartsehner Room on the library floor. This exhibit consists of tokens of honors conferred on physicians and commemorative disks of epoch making contributions to medicine. Some of these are curious "touch pieces," coins that were given to victims of the King's Evil (scrofula or struma) when the rulers of Great Britain "touched" such patients to cure them by the "divine power of royalty." Plastic disks and plates are actually miniature monuments to achievements in medical science. They are not ordinarily exhibited to the public. It is gratifying that the owners have lent their possessions to this unique cooperative display.

WOMEN'S ACTIVITIES

Program of Entertainment by Woman's Auxiliary

Entertainment for all women attending the St. Louis session of the American Medical Association and of the national Woman's Auxiliary, May 15-19, has been arranged by the Committee on Women's Activities.

St. Louis women and preconvention guests are requested to register in advance at Women's Headquarters at Hotel Chase in St. Louis Saturday May 13 between 1 and 4 p. m. or on Sunday May 14 between 10 a. m. and 4 p. m. Registration will continue from 8:30 a. m. to 4 p. m., Monday, Tuesday, Wednesday and Thursday, May 15, 16, 17 and 18, and from 8:30 a. m. to 11 a. m., Friday, May 19. All visiting women are requested to register as soon as possible after arrival.

SATURDAY, MAY 13

4:00 p. m. Finance Committee Meeting.

SUNDAY, MAY 14

10:00 a. m. to 4:00 p. m. Registration. Hostess Committee to receive visitors in afternoon.

4:00 p. m. to 7:00 p. m. Tea for the National Board of Directors and all visiting ladies in honor of Mrs. Charles C. Tomlinson, National President, as guests of Mrs. Willard Bartlett, 53 Westmoreland Place, the Board of St. Louis Auxiliary, the Convention Vice Chairman, the Chairman and Cochairmen of subcommittees assisting.

MONDAY, MAY 15

9:30 a. m. National board meeting, Regency Room, Hotel Chase.

1:30 p. m. to 4:45 p. m. Visits to St. Louis County private gardens and teas. Visits will be made to the private gardens of Mr. and Mrs. Horton Watkins, Mrs. Joseph W. Lewis, Dr. and Mrs. Borden S. Vecder, Mr. and Mrs. Oliver K. Bovard, Dr. and Mrs. Vilray P. Blair, Mr. and Mrs. Frank Mesker, Mr. Joseph Desloge and Mr. and Mrs. Samuel W. Fordyce. Bus fare 75 cents. Busses leave Hotel Statler, St. Charles Street entrance, at 12:45 p. m.; Hotel Jefferson, Locust Street entrance, at 1:05 p. m., and Hotel Coronado and Hotel Chase at 1:30 p. m., returning to hotels about 5 p. m. In case of rain, there will be a drive and teas.

TUESDAY, MAY 16

8:00 a. m. Southern Breakfast, Hotel Chase, with Mrs. Willis Kelly West, President of the Auxiliary to the Southern Medical Association, presiding.

9 a. m. to 12 m. Opening of convention of Woman's Auxiliary to the American Medical Association. General session, Regency Room, Hotel Chase, with Mrs. Charles C. Tomlinson, President, presiding. Invocation by Rev. John W. MacIvor.

12:30 p. m.

1:45 p. m.

4:00 p. m.

8:00 p. m.

9:00 a. m.

1:00 p. m.

2:30 p. m.

3:30 p. m.

7:00 p. m.

8:30 p. m.

9:00 a. m.

Luncheon St. Louis Woman's Club, 4600 Lindell Boulevard, in honor of Past Presidents of Woman's Auxiliary to American Medical Association, \$1.25.

Optional conducted tours, rain or shine, \$1.

(a) Forest Park area: Portland Place, Westmoreland Place, Lindbergh Trophies (inspection), Art Hill, Zoological Gardens (specially trained animal performance in amphitheater), Jewel Box Conservatory, Municipal Theater, Hospital Group of Washington University, New St. Louis Cathedral.

(b) Arts Tour: Portland Place, Westmoreland Place, Lindbergh Trophies (inspection), Museum of Fine Arts (inspection), Zoological Gardens, Hospital Group of Washington University, Missouri Botanical Gardens (inspection).

Busses leave Hotel Statler, St. Charles Street entrance, at 12:45 p. m.; Hotel Jefferson, Locust Street entrance, at 1:05 p. m.; Hotel Coronado and Hotel Chase at 1:30 p. m.; St. Louis Woman's Club at 1:45 p. m.

Tea, St. Louis Medical Society Building, as guests of the Woman's Club, St. Louis University School of Medicine.

Busses wait one hour at St. Louis Medical Society Building and return passengers to starting points 5:30 to 6 p. m.

Opening General Meeting of the American Medical Association in the Opera House of the Municipal Auditorium. (Special busses from Hotel Chase to Auditorium and return, 50 cents round trip.)

WEDNESDAY, MAY 17

Annual Meeting of Woman's Auxiliary to the American Medical Association, Regency Room, Hotel Chase, Mrs. Charles C. Tomlinson, presiding.

Annual luncheon, Chase Club, \$1.25. Speaker, Rock Sleyster, President, American Medical Association.

Exhibits and music.

Group conferences.

The Woman's Auxiliary to the St. Louis Medical Society invites all visiting ladies to the Seventeenth Anniversary reception and buffet supper at the St. Louis Medical Society Building in honor of the Founders and of the National President.

Fashion Show in Auditorium of St. Louis Medical Society Building.

THURSDAY, MAY 18

Forenoon Postconvention meetings, Mrs. Rollo K. Packard, Incoming President, presiding.

Executive Committee meeting.

- 10:00 a. m. Board of Directors meeting.
- 12:30 p. m. to 3:30 p. m. Mississippi River steamboat trip for men and women, \$1. Usual light refreshments available at reasonable prices. Transportation by special bus for those who buy tickets in advance, 50 cents. Special busses leave Hotel Chase at 11:50 a. m. and Hotel Coronado at 12 noon for boat dock.
- 7:00 p. m. Annual Bring Your Husband Dinner, Hotel Chase, \$2.

- 9:00 p. m. President's Reception and Ball, Hotel Jefferson. Hosts, American Medical Association (Bus arrangements from Hotel Chase to Hotel Jefferson, 25 cents)

FRIDAY, MAY 19

- 9:00 a. m. Golf. Blind bogey and medal play, St. Louis Country Club. Trophy and prizes offered. Green fee, \$1.50. Luncheon, \$1. Transportation provided.
- Morning open for individual plans or sight-seeing tour of historic St. Louis.

GOLF TOURNAMENT

The American Medical Golfing Association will hold its twenty-fifth annual tournament at the Norwood Hills Country Club on Monday, May 15. Members may tee off from 7:30 a. m. to 2:30 p. m.

FIFTY TROPHIES AND PRIZES

Thirty-six holes of golf will be played in competition for the fifty trophies and prizes in the nine events. Trophies will be awarded for the Association Championship, thirty-six holes

Calif., D. Chester Brown of Danbury, Conn., W. D. Sheldon of Rochester, Minn., Walter Schaller of San Francisco, Edwin Zabriskie of New York, Frank A. Kelly of Detroit, John Welsh Croskey of Philadelphia, Homer K. Nicoll of Chicago, Charles Lukens of Toledo, M. M. Cullom of Nashville, W. Albert Cook of Tulsa, Okla., and Walt P. Conaway of Atlantic City.

GRAYSON CARROLL HEADS ST. LOUIS GOLF COMMITTEE

The St. Louis committee is under the chairmanship of Grayson Carroll, 539 North Grand Boulevard, St. Louis. He will be assisted by Jack Eimer as secretary, Fred Bailey and Ross Woolsey.

TWO EIGHTEEN HOLE COURSES

The twenty-fifth tournament of the American Medical Golfing Association at the Norwood Hills Country Club promises to be a wonderful affair. The club is one of the most elaborate in the country, with two beautiful courses. The A. M. G. A. officers anticipate that some 250 to 300 medical golfers from all parts of the United States will play thirty-six holes in St. Louis on May 15.

APPLICATION FOR MEMBERSHIP

All male Fellows of the American Medical Association are eligible and are cordially invited to become members of the

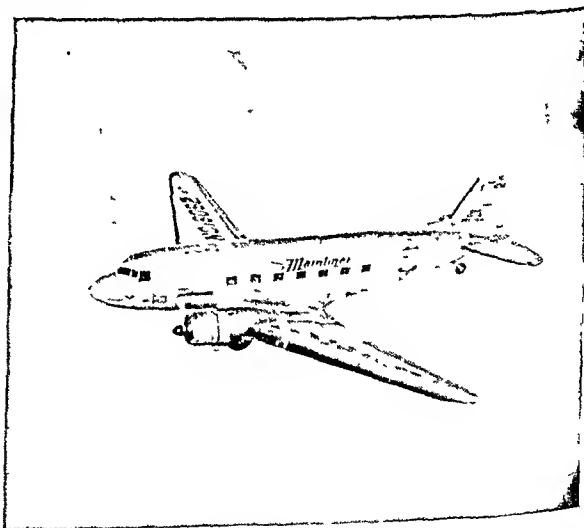


NORWOOD HILLS COUNTRY CLUB, WHERE A. M. G. A. GOLF TOURNAMENT WILL BE HELD MAY 15

gross, the Will Walter Trophy; the Association Handicap Championship, thirty-six holes net, the Detroit Trophy; the Championship Flight, First Gross, thirty-six holes, the St. Louis Trophy; the Championship Flight, First Net, thirty-six holes, the President's Trophy; the Eighteen Hole Championship, the Golden State Trophy; the Eighteen Hole Handicap Championship, the Ben Thomas Trophy; the Maturity Event, limited to Fellows over 60 years of age, the Minneapolis Trophy; the Oldguard Championship, limited to competition of past presidents, the Wendell Phillips Trophy, and the Kickers Handicap, the Atlantic City Trophy. Forty other prizes will be awarded for the various classes.

FELLOWS IN EVERY STATE OF THE UNION

E. S. Edgerton of 106 West Main Street, Wichita, Kan., is president. George Washington Hall of Chicago and James W. Morgan of San Francisco are vice presidents of the A. M. G. A., which was organized in 1915 by Will Walter, Wendell Phillips and Gene Lewis and now totals 1,464 members representing every state in the Union. The living past presidents include Thomas Hubbard of Ashtabula, Ohio, Fred Bailey of St. Louis, Robert Moss of LaGrange, Texas, Charlton Wallace of New York, Will Walter of Evanston, Ill., James Eaves of Oakland,



FLYING TO ST. LOUIS

A. M. G. A. Write Executive Secretary Bill Burns, 2020 Olds Tower, Lansing, Mich., for an application blank. Participants in the tournament are required to furnish their home club handicap, signed by the club secretary. No handicap over 30 is allowed, except in the Kickers (blind bogey). Only active Fellows of the A. M. G. A. may compete for prizes. No trophy is awarded a Fellow who is absent from the annual dinner.

PRELIMINARY PROGRAM OF THE SCIENTIFIC ASSEMBLY

THE OPENING GENERAL MEETING

Opera House, Municipal Auditorium

Tuesday, May 16—8 p. m.

Music.

Call to Order by the President, IRVIN ABELL.

Invocation. Right Rev. WILLIAM SCARLETT.

Welcome to St. Louis:

HON. LLOYD C. STARK, Governor of Missouri.

HON. BERNARD F. DICKMANN, Mayor of St. Louis.

JAMES R. McVAY, President, Missouri State Medical Association.

ALPHONSE McMAHON, President, St. Louis County Medical Society.

Selections by American Legionnaires Glee Club, Mr. CLAY BALLEW, Director.

Announcements. ROBERT E. SCHLUETER, Chairman, Local Committee on Arrangements.

Introduction and Installation of President-Elect ROCK SLEYSER, Wauwatosa, Wis.

Address. ROCK SLEYSER, President.

Music.

Presentation of Medal to Retiring President IRVIN ABELL. ARTHUR W. BOOTH, Chairman of the Board of Trustees.

Presentation of Distinguished Service Medal, ROCK SLEYSER, President.

Music.

THE PROGRAMS OF THE SECTIONS

Outline of the Scientific Proceedings—The Preliminary Program and the Official Program

The following papers are announced to be read before the various sections. The order here is not necessarily the order that will be followed in the Official Program, nor is the list complete. The Official Program will be similar to the programs issued in previous years and will contain the final program of each section with abstracts of the papers, as well as lists of committees, program of the Opening General Meeting, list of entertainments, map of St. Louis, and other information. To prevent misunderstandings and protect the interest of advertisers, it is here announced that this Official Program will contain no advertisements. It is copyrighted by the American Medical Association and will not be distributed before the session. A copy will be given to each Fellow on registration.

SECTION ON PRACTICE OF MEDICINE

MEETS IN GOLD ROOM OF HOTEL JEFFERSON

OFFICERS OF SECTION

Chairman—N. C. GILBERT, Chicago.

Vice Chairman—L. H. BRIGGS, San Francisco.

Secretary—FRED M. SMITH, Iowa City.

Executive Committee—JOHN H. MUSSER, New Orleans; FRANCIS G. BLAKE, New Haven, Conn.; N. C. GILBERT, Chicago.

Wednesday, May 17—9 a. m.

The Treatment of Massive Hemorrhage Due to Peptic Ulcer (Lantern Demonstration).

JOHN S. LA DUE, Minneapolis.

Complications Following the Administration of Sulfanilamide (Lantern Demonstration).

CURTIS F. GARVIN, Cleveland.

The Frank Billings Lecture. GEORGE DOCK, Pasadena, Calif.

The Symptomatology of Lymphoma: Its Endless Variety.

JAMES H. MEANS, Boston.

The Reaction of Peripheral Blood and Bone Marrow in Chronic Hemorrhage and in Essential Thrombocytopenic Purpura (Lantern Demonstration).

LOUIS R. LIMARZI and EMIL SCHLEICHER, Chicago.

The Differential Diagnosis and Therapeutic Rationale in Thrombocytopenic Purpura (Lantern Demonstration).

CHARLES A. DOAN, B. K. WISFMAN and SLOAN J. WILSON, Columbus.

Thursday, May 18—9 a. m.

Election of Officers

Parathyroid Insufficiency with Symmetrical Cerebral Calcification: Report of Three Cases, in One of Which the Patient Was Treated with Dihydrotachysterol (Lantern Demonstration).

L. MCKENDREE EATON and SAMUEL F. HAINES, Rochester, Minn.

Chairman's Address.

N. C. GILBERT, Chicago.

Coronary Artery Reflexes in Acute Occlusion (Experimental) (Lantern Demonstration).

G. E. HALL, Toronto, Canada.

The Mechanism of Death in Pulmonary Embolism (Lantern Demonstration).

GEZA DE TAKATS and GEORGE K. FENN, Chicago.

The Morgagni-Adams-Stokes Syndrome with Special Reference to Prognosis and Treatment (Including the Use of Digitalis and Epinephrine in Oil) (Lantern Demonstration).

F. L. CHAMBERLAIN and PAUL D. WHITE, Boston.

The Delayed Appearance of Heart Disease After Rheumatic Fever (Lantern Demonstration).

EDWARD F. BLAND, Boston.

Fifteen Years' Observation of Children with Rheumatic Heart Disease (Lantern Demonstration).

WILLIAM D. STROUD, Philadelphia.

Friday, May 19—9 a. m.

JOINT MEETING WITH SECTION ON PHARMACOLOGY AND THERAPEUTICS

Treatment of the Menopause (Lantern Demonstration).

ELMER L. SEVRINGHAUS, Madison, Wis.

An Evaluation of Therapy of Peptic Ulcer.

CLARENCE F. G. BROWN, Chicago, and R. E. DOLKART, Boston.

Treatment of Pneumonia (Lantern Demonstration).

M. HERBERT BARKER, Chicago.

Bromide Intoxication: Report of Fifteen Cases (Lantern Demonstration).

LEWIS P. GUNDRY, Baltimore.

Clinical and Experimental Studies on Vitamin K (Lantern Demonstration).

H. P. SMITH, Iowa City.

The Preoperative and Postoperative Use of Vitamin K in Cases of Obstructive Jaundice (Lantern Demonstration).

HUGH R. BUTT, ALBERT M. SNELL and ARNOLD E. OSTERBERG, Rochester, Minn.

SECTION ON SURGERY, GENERAL AND ABDOMINAL

MEETS IN OPERA HOUSE OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

Chairman—HENRY W. CAVE, New York.

Vice Chairman—FRED W. BAILEY, St. Louis.

Secretary—ARTHUR W. ALLEN, Boston.

Executive Committee—ROBERT S. DINSMORE, Cleveland; HUGH H. TROUT, Roanoke, Va.; HENRY W. CAVE, New York.

Wednesday, May 17—2 p. m.

Reactions of the Peritoneum to Trauma and Infection: Further Experimental Studies (Lantern Demonstration).

FREDERICK A. COLLIER, HENRY K. RANSOM and CHARLES SHERRILL RIFE, Ann Arbor, Mich.

Stages in Peritonitis Based on the Defense Mechanism in Relation to Treatment (Lantern Demonstration).

BERNHARD STIFFENBERG, Toledo, Ohio.

Complications of Appendical Peritonitis (Lantern Demonstration).

GEORGE D. LILLY, Miami, Fla.

One Hundred per Cent Oxygen: Indications for Its Use and Methods of Administration to Surgical Patients (Lantern and Motion Picture Demonstration).

WALTER M. BOOTHBY, CHARLES W. MAYO and W. RANDOLPH LOVELACE II, Rochester, Minn.

Surgical Lesions in the Paratrigeminal Area (Lantern Demonstration).

LOYAL DAVIS and JOHN MARTIN, Chicago.

Cerebral Complications Following Surgical Operation (Lantern Demonstration).

ALBERT BEHREND and HELENA E. RIGGS, Philadelphia.

Thursday, May 18—2 p. m.

Thrombophlebitis: The Etiologic Factor of Vasospasm and the Treatment by Sympathetic Block (Lantern Demonstration).

ALTON OCHSNER and MICHAEL E. DEBARTY, New Orleans.

Arteriosclerotic Gangrene: Relation of the Amputation Stump to Morbidity and Mortality (Lantern Demonstration).

FREDERIC W. TAYLOR, Indianapolis.

Major Amputations in Advance Peripheral Arterial Obliterative Disease (Lantern Demonstration).

HENRY H. FAXON, Boston.

Chairman's Address: Chronic Intractable Ulcerative Colitis; a Surgical Problem (Lantern Demonstration).

HENRY W. CAVE, New York.

Control of the Hemorrhagic Tendency in Obstructive Jaundice by the Use of Vitamin K (Lantern Demonstration).

JOHN D. STEWART, Boston.

Congenital Lesions of the Neck (Lantern Demonstration).

CONRAD J. BAUMGARTNER, Los Angeles.

Ludwig's Angina, Retropharyngeal Abscess and Other Deep Abscesses of the Head and Neck (Lantern Demonstration).

MANUEL GRODINSKY, Omaha.

Friday, May 19—2 p. m.

Election of Officers

Surgical Aspects of Carcinoma of the Large Bowel (Lantern Demonstration).

HARVEY B. STONE and SAMUEL McLANAHAN, Baltimore.

Hypoproteinemia in Surgical Patients (Lantern Demonstration).

I. S. RAYDIN, ALFRED STENGEL JR. and CECILIA RIEGEL, Philadelphia.

The Immediate and Late Results of Surgical Treatment of Acute Perforation of Peptic Ulcer (Lantern Demonstration).

HAROLD LINCOLN THOMPSON, Los Angeles.

Pathogenesis of Thyrotoxicosis with Crisis (Lantern Demonstration).

HAROLD L. FOSS, Danville, Pa.

Lateral Aberrant Thyroid Tumors (Lantern Demonstration).

GEORGE CRILE JR., Cleveland.

The Management of True Intrathoracic Goiter (Lantern Demonstration).

FRANK H. LAHEY, Boston.

SECTION ON OBSTETRICS AND GYNECOLOGY

MEETS IN OPERA HOUSE OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

Chairman—HARVEY B. MATTHEWS, Brooklyn.

Vice Chairman—LUDWIG A. EMGE, San Francisco.

Secretary—NORMAN F. MILLER, Ann Arbor, Mich.

Executive Committee—M. PIERCE RUCKER, Richmond, Va.; E. D. PLASS, Iowa City; HARVEY B. MATTHEWS, Brooklyn.

Wednesday, May 17—9 a. m.

SYMPOSIUM ON LESIONS OF THE VULVA

Anatomy of the Lower Genital Tract (Lantern Demonstration).

ROLLO E. MCCOTTER, Ann Arbor, Mich.

Venereal and Nonvenereal Granulomas of the Vulva (Lantern Demonstration).

EMMERICH VON HAAM, Columbus.

Benign and Malignant Tumors of the Vulva (Lantern Demonstration).

CLAIR E. FOLSOME, Ann Arbor, Mich.

Atrophy of the Vulva (Lantern Demonstration).

FRED L. ADAIR and M. EDWARD DAVIS, Chicago.

Backache During Pregnancy and Its Management (Lantern Demonstration).

EDMUND LISSACK, Concordia, Mo.

The Role of Hypothyroidism in the Causation of Abortion, Especially of the "Missed" Variety (Lantern Demonstration).

E. L. KING, New Orleans.

Thursday, May 18—9 a. m.

The Responsibility of the Medical Profession in the Movement of Birth Control.

GEORGE W. KOSMAK, New York.

The Effects of Obstetric Analgesia on the Newborn Infant (Lantern Demonstration).

JACOB KOTZ, Washington, D. C.

Studies in Neonatal Asphyxia (Lantern Demonstration).

DAVID C. KIMBALL, WYMAN C. C. COLE and L. E. DANIELS, Detroit.

Postoperative Care of the Urinary Bladder (Lantern Demonstration).

RICHARD W. TELINDE and J. DONALD WOODRUFF, Baltimore.

Chairman's Address: Obstetric Shock; Its Causes, Recognition and Management (Lantern Demonstration).

HARVEY B. MATTHEWS, Brooklyn.

Friday, May 19—9 a. m.

Election of Officers

The Diagnosis and Treatment of Hyperthyroidism Associated with Pregnancy.

BERNARD PORTIS and HAROLD A. ROTH, Chicago.

Diagnosis and Treatment of Varicosities of the Broad Ligament (Lantern Demonstration).

W. O. JOHNSON, Louisville, Ky.

Stress Urinary Incontinence and Its Relation to Cystocele (Lantern Demonstration).

JOSHUA W. DAVIES, New York.

A Study of Cervical Polyps (Lantern Demonstration).

S. LEON ISRAEL, Philadelphia.

The Treatment of Retrodisplacements of the Uterus (Lantern Demonstration).

WALTER T. DANNREUTHER, New York.

SECTION ON OPHTHALMOLOGY

MEETS IN ASSEMBLY ROOM 1 OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

Chairman—S. JUDD BEACH, Portland, Maine.

Vice Chairman—FREDERICK C. CORDEZ, San Francisco.

Secretary—DERRICK VAIL, Cincinnati.

Executive Committee—WILLIAM L. BENEDICT, Rochester, Minn.; PARKER HEATH, Detroit; S. JUDD BEACH, Portland, Maine.

Wednesday, May 17—2 p. m.

Chairman's Address (Lantern Demonstration).

S. JUDD BEACH, Portland, Maine.

Thoughts on Office Practice.

ALLEN GREENWOOD, Boston.

A Simple Method of Plotting, Recording and Interpreting Disturbances of Ocular Motility (Lantern Demonstration).

WALTER B. LANCASTER, Boston.

The Treatment of Secondary Glaucoma (Lantern Demonstration).

SANFORD R. GIFFORD, Chicago.

Discussion to be opened by EDWARD C. ELLETT, Memphis, Tenn.

Iridencleisis in Glaucoma (Lantern Demonstration).

EVERETT L. GOAR and JACOB F. SCHULTZ, Houston, Texas.

Discussion to be opened by CLYDE A. CLAPP, Baltimore.

The Value of Early Operation in Chronic Primary Glaucoma (Lantern Demonstration).

ALGERNON B. REESE, New York.

Discussion to be opened by HARRY S. GRADLE, Chicago.

Cyclodialysis with Metal Implant in the Treatment of Glaucoma (Lantern and Motion Picture Demonstration).

MANUEL U. TRONECO, New York.

Discussion to be opened by OTIS R. WOLFE, Marshalltown, Iowa.

Thursday, May 18—2 p. m.

Ocular Leprosy in the United States (Lantern Demonstration).

JOHN J. PRENDERGAST, St. Paul.

Discussion to be opened by GIDEON M. VAN POOLE

and FORREST J. PINKERTON, Honolulu, Hawaii.

Primary Tumors of the Optic Nerve: A Phenomenon of von Recklinghausen's Disease; a Clinical and Pathologic Study with a Report of Five Cases and a Review of the Literature (Lantern Demonstration).

FREDERICK A. DAVIS, Madison, Wis.

Discussion to be opened by PERCIVAL BAILEY, Chicago,

and JESSE M. LEVITT, Brooklyn.

Malignant Melanoma of Uvea—So-Called Sarcoma: Problems in Diagnosis (Lantern Demonstration).

THEODORE L. TERRY, Boston.

Discussion to be opened by EVERETT C. MOULTON, Fort

Smith, Ark., and ALLEN GREENWOOD, Boston.

Experimental Studies on Ocular Tuberculosis: IV. Studies in the Immune-Allergic Rabbit (Lantern Demonstration).

ALAN C. WOODS and EARL L. BURKY, Baltimore.

Discussion to be opened by MARTIN HAYWARD POST, St.

Louis, and ALBERT L. BROWN, Cincinnati.

A Study of Exfoliation of the Lens Capsule, "Glaucoma Cap-sularis," with a Report of Forty Cases (Lantern Demonstration).

S. RODMAN IRVINE, Los Angeles.

Discussion to be opened by DANIEL B. KIRBY, New York,

and PARKER HEATH, Detroit.

Cataract Following Inhalation of Paradichlorobenzene (Lantern Demonstration). MILTON L. BERLINER, New York.
Discussion to be opened by JAMES E. LEBENSOHN, Chicago.

Friday, May 19—2 p. m.

Executive Session

Election of Officers

Observations on the Eye and Their Significance in Traffic Court Cases (Lantern Demonstration).

LOWELL S. SELLING, Detroit.

Discussion to be opened by ARTHUR J. BEDELL, Albany, N. Y., and ALBERT C. SNELL, Rochester, N. Y.

Ophthalmology's Place in the Prevention of Blindness.

F. PARK LEWIS, Buffalo.

Discussion to be opened by EDWARD V. L. BROWN, Chicago, and CONRAD BERLINS, New York.

Progressive Myopia, Keratoconus and Keratoglobus: Their Etiology and Treatment. JULIAN Y. MALONE, Milwaukee.

Discussion to be opened by WILLIAM L. BENEDICT, Rochester, Minn., and MEYER WIENER, St. Louis.

Interstitial Keratitis Caused by Specific Sensitivity (Lantern Demonstration).

ABBOTT M. DEAN, F. W. DEAN and GUY R. McCUTCHAN, Council Bluffs, Iowa.

Discussion to be opened by ALBERT D. RUEDEMANN, Cleveland, and ALBERT N. LEMOINE, Kansas City, Mo.

SECTION ON LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY

MEETS IN ASSEMBLY ROOM 1 OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

Chairman—H. MARSHALL TAYLOR, Jacksonville, Fla.

Vice Chairman—HAROLD A. FLETCHER, San Francisco.

Secretary—LEROY A. SCHALL, Boston.

Executive Committee—ROBERT F. RIDPATH, Philadelphia; GORDON B. NEW, Rochester, Minn.; H. MARSHALL TAYLOR, Jacksonville, Fla.

Wednesday, May 17—9 a. m.

The Arterial and Venous Circulation of the Nose and the Accessory Sinuses and the Surgical Significance (Lantern Demonstration). SIMON L. RUSKIN, New York.

Discussion to be opened by O. JASON DIXON, Kansas City, Mo., and LOUIS J. BIRSNER, St. Louis.

Sinus Surgery: Critical Analysis of Diagnosis and Technic in Operations on the Maxillary Sinus (Lantern Demonstration). ROY F. NELSON, Oakland, Calif.

Discussion to be opened by WILLIAM MITHOEFER, Cincinnati, and MILLARD F. ARBUCKLE, St. Louis.

Argyria (Lantern Demonstration). BEN L. BRYANT, Los Angeles.

Discussion to be opened by FRANK J. NOVAK JR., Chicago, and GORDON F. HARKNESS, Davenport, Iowa.

Infection of the Mouth and Face (Lantern Demonstration).

THOMAS E. CARMODY, Denver.

Discussion to be opened by AUGUST L. BECK, New Rochelle, N. Y., and HOWARD C. BALLENGER, Chicago.

Cancer of the Larynx (Lantern Demonstration).

GABRIEL TUCKER, Philadelphia.

Discussion to be opened by FREDERICK A. FIGI, Rochester, Minn., and LEROY A. SCHALL, Boston.

Thursday, May 18—9 a. m.

Election of Officers

Chairman's Address: Otitis and Sinusitis in the Swimmer (Motion Picture Demonstration).

H. MARSHALL TAYLOR, Jacksonville, Fla.

Otitic Meningitis (Lantern Demonstration).

DANIEL S. CUNNING, New York.

Recurrence of Otitic Infections Due to Beta-Hemolytic Streptococci Following Inadequate Sulfanilamide Therapy (Lantern Demonstration).

JOHN M. CONVERSE, New York.

Discussion on papers of DRs. CUNNING and CONVERSE to be opened by WELLS P. EAGLETON, Newark, N. J., and BERNARD J. McMAHON, St. Louis.

Plastic Reconstruction Following Radical Operation for Osteomyelitis of the Frontal Bone (Lantern Demonstration).

V. H. KAZANJIAN, Boston.

Discussion to be opened by HARRIS P. MOSHER, Boston; VILRAY P. BLAIR, St. Louis, and ROBERT H. IVY, Philadelphia.

Diplocus (Lantern Demonstration).

GEORGE E. SHAMBAUGH JR., Chicago.

Discussion to be opened by ARTHUR W. PROETZ, St. Louis, and GEORGE M. COATES, Philadelphia.

Abnormal Movements Following Injury to the Facial Nerve (Lantern Demonstration).

EDMUND P. FOWLER JR., New York.

Discussion to be opened by JOSEPH A. SULLIVAN, Toronto, Canada, and ERNEST SACHS, St. Louis.

Friday, May 19—9 a. m.

JOINT MEETING WITH SECTION ON PEDIATRICS

Rational Treatment of Sinusitis in Children (Lantern Demonstration). JOHN J. SHEA, Memphis, Tenn.

Discussion to be opened by LEE WALLACE DEAN JR., St. Louis, and HARRIS HOSEN, Port Arthur, Texas.

The Diagnosis and Treatment of Otitis Media in Children (Lantern Demonstration).

HORACE J. WILLIAMS, Philadelphia.

Discussion to be opened by DEAN M. LIERLE, Iowa City, and BORDEN S. VEEDEER, St. Louis.

The Clinical Importance of Respiratory Infections in Rheumatic Fever (Lantern Demonstration).

T. DUCKETT JONES and JOHN R. MOTE, Boston.

Discussion to be opened by WILLIAM P. WHERRY, Omaha, and WILLIAM D. STROUD, Philadelphia.

Upper Respiratory Allergy in Infancy and Children (Lantern Demonstration).

GEORGE PINES and HYMAN MILLER, Los Angeles.

Discussion to be opened by FRENCH K. HANSEL, St. Louis, and FRANCIS M. POTTINGER JR., Monrovia, Calif.

SECTION ON PEDIATRICS

MEETS IN GOLD ROOM OF HOTEL JEFFERSON

OFFICERS OF SECTION

Chairman—EDWARD CLAY MITCHELL, Memphis, Tenn.

Vice Chairman—JEAN V. COOKE, St. Louis.

Secretary—ALBERT D. KAISER, Rochester, N. Y.

Executive Committee—RALPH M. TYSON, Philadelphia; CLIFFORD SWEET, Oakland, Calif.; EDWARD CLAY MITCHELL, Memphis, Tenn.

Wednesday, May 17—2 p. m.

A Study of Cerebral Hemorrhage in the Newborn.

M. HINES ROBERTS, Atlanta, Ga.

Discussion to be opened by RALPH M. TYSON, Philadelphia, and HUGO EHRENFEST, St. Louis.

The Effect of Various Complementary Feedings on the Gain in Weight and Stimulation of Breast Milk During the Newborn Period (Lantern Demonstration).

HEYWORTH N. SANFORD, Chicago.

Discussion to be opened by CLIFFORD G. GRULEE, Evanston, Ill., and WILLIAM J. ORR, Buffalo.

Chairman's Address: Child Health in National Defense (Lantern Demonstration).

EDWARD CLAY MITCHELL, Memphis, Tenn.

Smallpox Vaccination of Infants: Revaccinations After Two to Three Years in Children Primarily Vaccinated with Culture Virus (Rivers), Compared with Those Primarily Vaccinated with Calf Lymph Virus (Lantern Demonstration). HARRY H. DONNALLY, Washington, D. C.

Discussion to be opened by JAMES P. LEAKE and CHARLES ARMSTRONG, Washington, D. C.

Convulsions in Infancy and Childhood: A Report of One Thousand Cases (Lantern and Motion Picture Demonstration). M. G. PETERMAN, Milwaukee.

Discussion to be opened by HENRY F. HELMHOLTZ, Rochester, Minn., and H. R. COOPER, Los Angeles.

Respiratory Infections: Types and Clinical Course as Observed in Florida Pediatric Practice (Lantern Demonstration).

WARREN W. QUILLIAN, Coral Gables, Fla.

Discussion to be opened by ROBERT A. STRONG, New Orleans, and HORTON R. CASPARIS, Nashville, Tenn.

Thursday, May 18—2 p. m.

Election of Officers

Varying Manifestations of Thyroid Gland Aberrancies in Infants, Children and Adolescents (Lantern Demonstration).

CHARLES GILMORE KERLEY, New York.

Discussion to be opened by E. KOST SHELTON, Los Angeles, and THEODORE T. ZUCK, Cleveland.

PANEL DISCUSSION**MANAGEMENT OF PNEUMONIA IN INFANCY AND CHILDHOOD**

Leader: CHARLES HENDEE SMITH, New York

Assistants: ALEXIS F. HARTMANN, St. Louis

A. V. STOESEER, Minneapolis

ROSA LEE NEMUR, Brooklyn

BENJAMIN W. CAREY JR., Detroit

The subjects to be discussed are

Importance of Differentiating Pneumococcal (Lobar) Pneumonia and Bronchopneumonia.

Typing and Its Significance.

Treatment: Sulfapyridine; Future of Serum; General.

Friday, May 19—9 a. m.

JOINT MEETING WITH SECTION ON LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY IN ASSEMBLY ROOM 1 OF MUNICIPAL AUDITORIUM

Rational Treatment of Sinusitis in Children (Lantern Demonstration).

JOHN J. SHEA, Memphis, Tenn.

Discussion to be opened by LEE WALLACE DEAN JR., St. Louis, and HARRIS HOSSEN, Port Arthur, Texas.

The Diagnosis and Treatment of Otitis Media in Children (Lantern Demonstration).

HORACE J. WILLIAMS, Philadelphia.

Discussion to be opened by DEAN M. LIERLE, Iowa City, and BORDEN S. VEEDER, St. Louis.

The Clinical Importance of Respiratory Infections in Rheumatic Fever (Lantern Demonstration).

T. DUCKETT JONES and JOHN R. MORE, Boston.

Discussion to be opened by WILLIAM P. WHERRY, Omaha, and WILLIAM D. STROUT, Philadelphia.

Upper Respiratory Allergy in Infancy and Children (Lantern Demonstration).

GEORGE PINESS and HYMAN MILLER, Los Angeles.

Discussion to be opened by FRENCH K. HANSEL, St. Louis, and FRANCIS M. POTTINGER JR., Monrovia, Calif.

SECTION ON PHARMACOLOGY AND THERAPEUTICS

MEETS IN ASSEMBLY ROOM 2 OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

Chairman—ERWIN E. NELSON, New Orleans.

Vice Chairman—IRVING S. WRIGHT, New York.

Secretary—EDGAR V. ALLEN, Rochester, Minn.

Executive Committee—N. C. GILBERT, Chicago; RUSSELL L. HADEN, Cleveland; ERWIN E. NELSON, New Orleans.

Wednesday, May 17—2 p. m.

Treatment with Preparations Containing Vitamins A and D.

P. C. JEANS, Iowa City.

Discussion to be opened by IRVINE McQUARRIE, Minneapolis, and ALEXIS F. HARTMANN, St. Louis.

Treatment with Vitamin C (Lantern Demonstration).

IRVING S. WRIGHT, New York.

Discussion to be opened by S. B. WORTIS, New York.

Treatment with Male Sex Hormones (Lantern Demonstration).

WILLARD O. THOMPSON and NORRIS J. HECKEL, Chicago.

Discussion to be opened by E. PERRY McCULLAGH, Cleveland, and F. C. KOCII, Chicago.

Treatment of Auricular Fibrillation (Lantern Demonstration).

H. L. SMITH, Rochester, Minn.

Discussion to be opened by ROY W. SCOTT, Cleveland.

Treatment of Edema by Rectal Administration of Diuretics.

I. J. BRIGHTMAN, Brooklyn, and R. A. LEHMAN, New York.

Discussion to be opened by HAROLD J. STEWART, New York.

Treatment of Pneumonia with Sulfapyridine (Lantern Demonstration).

HERBERT K. ENSWORTH and NORMAN H. PLUMMER, New York.

Discussion to be opened by RUSSELL L. CECIL, New York, and H. F. FLIPPIN, Philadelphia.

Thursday, May 18—2 p. m.

Election of Officers

Chairman's Address: Variability in Response to Drugs (Lantern Demonstration).

ERWIN E. NELSON, New Orleans.

Treatment of the Anxiety States with Special Attention to Certain Physiologic Manifestations (Lantern Demonstration).

WILLIAM J. KERR and P. A. GLIEBE, San Francisco;

MAYO H. SOLEY, San Mateo, Calif., and NATHAN W. SHOCK, Berkeley, Calif.

Discussion to be opened by FRED H. ALLEN, Philadelphia, and FRANKLIN G. EBAUGH, Denver.

Nonsurgical Aspects of the Kidney Stone Problem (Lantern Demonstration).

FULLER ALBRIGHT, RICHARD CHUTE and HIRSH W. SULKOWITZ, Boston.

Discussion to be opened by CHARLES C. HIGGINS, Cleveland, and WILLIAM F. BRAASCH, Rochester, Minn.

The Action of Drugs on the Caliber of the Coronary Vessels (Lantern Demonstration).

LOUIS N. KATZ, Chicago.

The Effects of Pituitary Extracts on Metabolism (Lantern Demonstration).

J. B. COLLIP, A. H. NEUFELD and O. F. DENSTEDT, Montreal, Canada.

Discussion to be opened by ELMER L. SEVRINGHAUS, Madison, Wis., and DAVID P. BARR, St. Louis.

The Present Status of Lipocaine (Lantern Demonstration).

LESTER R. DRAGSTEDT, Chicago.

Discussion to be opened by DAVID H. ROSENBERG, Chicago.

Friday, May 19—9 a. m.

JOINT MEETING WITH SECTION ON PRACTICE OF MEDICINE, GOLD ROOM OF HOTEL JEFFERSON

Treatment of the Menopause (Lantern Demonstration).

ELMER L. SEVRINGHAUS, Madison, Wis.

An Evaluation of Therapy of Peptic Ulcer.

CLARENCE F. G. BROWN, Chicago, and R. E. DOLKART, Boston.

Treatment of Pneumonia (Lantern Demonstration).

M. HERRERT BARKER, Chicago.

Bromide Intoxication: Report of Fifteen Cases (Lantern Demonstration).

LEWIS P. GUNDRY, Baltimore.

Clinical and Experimental Studies on Vitamin K (Lantern Demonstration).

H. P. SMITH, Iowa City.

The Preoperative and Postoperative Use of Vitamin K in Cases of Obstructive Jaundice (Lantern Demonstration).

HUGH R. BUTT, ALBERT M. SNELL and ARNOLD E. OSTERBERG, Rochester, Minn.

SECTION ON PATHOLOGY AND PHYSIOLOGY

MEETS IN ASSEMBLY ROOM 2 OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

Chairman—M. B. VISSCHER, Minneapolis.

Vice Chairman—F. W. HARTMAN, Detroit.

Secretary—J. J. MOORE, Chicago.

Executive Committee—W. E. GARREY, Nashville, Tenn.; ROY R. KRACKE, Emory University, Ga.; M. B. VISSCHER, Minneapolis.

Wednesday, May 17—9 a. m.

Chairman's Address: The Restriction of the Coronary Flow as a Factor in Heart Failure (Lantern Demonstration).

M. B. VISSCHER, Minneapolis.

Experimental Studies on the Pathogenesis of Nephritis (Lantern Demonstration).

J. P. SIMONDS, Chicago.

A Method for Producing Persistent Hypertension by Cellophane (Lantern Demonstration).

IRVINE H. PAGE, Indianapolis.

Biologic Effects of Testosterone Propionate on the Human Female (Lantern Demonstration).

SAMUEL H. GEIST, UDALL J. SALMON and JOSEPH A. GAINES, New York.

Temperature Factor in Cancer and Embryonal Cell Growth (Lantern Demonstration).

LAWRENCE W. SMITH and TEMPLE S. FAY, Philadelphia.

The Correlation of the Pathologic Lesions and the Anoxia Resulting from Alcohol (Lantern Demonstration).

F. W. HARTMAN, Detroit.

Relations Between Specific Immunity, Allergy and Anaphylaxis in Tuberculosis (Lantern Demonstration).

H. J. CORPER, MAURICE L. COHN and A. P. DAMEROW, Denver.

Thursday, May 18—9 a. m.

Election of Officers

SYMPOSIUM ON SULFANILAMIDE

Experimental Chemotherapy with Sulfanilamide and Related Compounds. SANFORD M. ROSENTHAL, Washington, D. C.

Action of Sulfanilamide Analyzed by Tissue Culture Methods (Lantern Demonstration). JOSEPH T. KING, Minneapolis.

Anticatalase Property of Sulfanilamide in Relation to the Drug's Bacteriostatic Action (Lantern Demonstration).

RALPH R. MELLON, Pittsburgh.

The Influence of Proteolytic Products on the Effectiveness of Sulfanilamide (Lantern Demonstration).

JOHN S. LOCKWOOD, Philadelphia.

Effect of Sulfapyridine Alone and with Serum and in Serum of Treated Pneumonia Patients on Pneumococcus Infected Marrow Cultures (Lantern Demonstration).

JESSE G. M. BULLOWA, New York; EDWIN E. OSGOOD, Portland, Ore., and SAMUEL C. BUKANTZ, New York.

Friday, May 19—9 a. m.

JOINT MEETING WITH SECTION ON NERVOUS AND MENTAL DISEASES

The Neurotropic Viruses (Lantern Demonstration).

L. S. KING, Princeton, N. J.

Discussion to be opened by ROBERT G. GREEN, Minneapolis, and RICHARD B. RICHTER, Chicago.

SYMPOSIUM ON VITAMIN DEFICIENCIES AND RELATED NEURAL DISORDERS

Vitamin Deficiencies and the Nervous System: A Consideration of the Contribution of Animal Experimentation.

GEORGE R. COWGILL, New Haven, Conn.

The Physiologic Action of the Vitamin B Complex.

F. H. LEWY, Philadelphia.

The Neuropathology of Vitamin B Deficiency.

HARRY M. ZIMMERMAN, New Haven, Conn.

Clinical Aspects of Vitamin B Deficiencies (Lantern Demonstration).

CHARLES D. ARING, TOM D. SPIES and J. P. EVANS, Cincinnati.

Discussion to be opened by ARTHUR WEIL, Chicago, and HANS H. REESE, Madison, Wis.

SECTION ON NERVOUS AND MENTAL DISEASES

MEETS IN ASSEMBLY ROOM 4 OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

Chairman—FRANCIS C. GRANT, Philadelphia.

Vice Chairman—RICHARD M. BRICKNER, New York.

Secretary—PAUL C. BUCY, Chicago.

Executive Committee—HENRY R. VIETS, Boston; SAMUEL D. INGHAM, Los Angeles; FRANCIS C. GRANT, Philadelphia.

Wednesday, May 17—2 p. m.

The Use of Guanidine Compounds in the Treatment of Myasthenia Gravis (Lantern Demonstration).

ANN S. MINOT, KATHARINE DODD and S. S. RIVEN, Nashville, Tenn.

Myasthenia Gravis (Lantern Demonstration).

HENRY R. VIETS and ROBERT S. SCHWAB, Boston.

Discussion to be opened by FOSTER KENNEDY, New York, and J. C. MCKINLEY, Minneapolis.

Chairman's Address: The Surgical Treatment of Pituitary Adenomas (Lantern Demonstration).

FRANCIS C. GRANT, Philadelphia.

Irradiation in the Treatment of Pituitary Adenomas (Lantern Demonstration).

M. C. SOSMAN, Boston.

Discussion to be opened by GEORGE W. CHAMBERLIN, Philadelphia, and ERNEST SACHS, St. Louis.

The Role of Potassium Chloride in the Treatment of Mènière's Syndrome (Lantern Demonstration).

MADELAINE R. BROWN, Boston.

Mènière's Disease: Medical and Surgical Treatment (Lantern Demonstration).

A. W. ADSON and M. N. WALSH, Rochester, Minn.

Discussion to be opened by F. D. LATHROP, Ann Arbor, Mich., and CLAUDE C. COLEMAN, Richmond, Va.

Thursday, May 18—2 p. m.

Election of Officers

The Posttraumatic Psychoneurotic State and Traumatic Encephalopathy (Lantern Demonstration).

WALTER F. SCHALLER, San Francisco.

Discussion to be opened by GEORGE W. HALL, Chicago, and SIDNEY I. SCHWAB, St. Louis.

The Differential Diagnosis of Anxiety Neurosis (Lantern Demonstration).

STANLEY COBB and M. E. COHEN, Boston.

Discussion to be opened by DAVID SLIGHT, Chicago, and LESLIE B. HOHMAN, Baltimore.

Results of Treatment in a Psychiatric Outpatient Department (Lantern Demonstration).

H. T. CARMICHAEL and J. H. MASSERMANN, Chicago.

Discussion to be opened by LLOYD H. ZIEGLER, Wauwatosa, Wis., and KARL A. MENNINGER, Topeka, Kan.

Probable Topography of the Sleep-Regulating Center (Lantern Demonstration).

JOSEPH H. GLOBUS, New York.

Discussion to be opened by PERCIVAL BAILEY, Chicago, and JOHN F. FULTON, New Haven, Conn.

Delayed Paralysis of Nerves from Indirect Trauma.

J. M. NIELSEN, Los Angeles.

Discussion to be opened by L. J. POLLOCK, Chicago, and R. B. RANEY, Los Angeles.

Friday, May 19—9 a. m.

JOINT MEETING WITH SECTION ON PATHOLOGY AND PHYSIOLOGY, ASSEMBLY ROOM 2 OF MUNICIPAL AUDITORIUM

The Neurotropic Viruses (Lantern Demonstration).

L. S. KING, Princeton, N. J.

Discussion to be opened by ROBERT G. GREEN, Minneapolis, and RICHARD B. RICHTER, Chicago.

SYMPOSIUM ON VITAMIN DEFICIENCIES AND RELATED NEURAL DISORDERS

Vitamin Deficiencies and the Nervous System: A Consideration of the Contribution of Animal Experimentation.

GEORGE R. COWGILL, New Haven, Conn.

The Physiologic Action of the Vitamin B Complex.

F. H. LEWY, Philadelphia.

The Neuropathology of Vitamin B Deficiency.

HARRY M. ZIMMERMAN, New Haven, Conn.

Clinical Aspects of Vitamin B Deficiencies (Lantern Demonstration).

CHARLES D. ARING, TOM D. SPIES and J. P. EVANS, Cincinnati.

Discussion to be opened by ARTHUR WEIL, Chicago, and HANS H. REESE, Madison, Wis.

SECTION ON DERMATOLOGY AND SYPHILOLOGY

MEETS IN ASSEMBLY ROOM 3 OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

Chairman—BEDFORD SHELMIERE, Dallas, Texas.

Vice Chairman—ROBERT C. JAMIESON, Detroit.

Secretary—C. F. LEHMANN, San Antonio, Texas.

Executive Committee—PAUL A. O'LEARY, Rochester, Minn.; JOSEPH V. KLAUDER, Philadelphia; BEDFORD SHELMIERE, Dallas, Texas.

Wednesday, May 17—2 p. m.

Chairman's Address: Weeds Causing Contact Eczema (Lantern Demonstration).

BEDFORD SHELMIERE, Dallas, Texas.

Contact Dermatitis from Opium Derivatives: Special Reference to Occupational Aspects (Lantern Demonstration).

JAMES W. JORDON and EARL D. OSBORNE, Buffalo.

Discussion to be opened by M. B. SULZBERGER, New York.

Acne in a Group of University Students (Lantern Demonstration).

FRANCIS W. LYNCH, St. Paul.

Discussion to be opened by JOSEPH GARDNER HOPKINS, New York.

Vitamin Therapy in Dermatology, with Particular Reference to Vitamin D Effects in Acne and Disease of Altered Calcium Usage (Lantern Demonstration).

MERLIN T.-R. MAYNARD, San Jose, Calif.

Discussion to be opened by PAUL GROSS, New York.

Roentgen Dosages in Dermatology.

GEORGE M. MACKEE and ANTHONY C. CIPOLLARO, New York.

Discussion to be opened by HARRY R. FOERSTER, Milwaukee.

Gentian Violet Treatment of Ringworm of the Scalp.

W. F. SPILLER and W. B. SHARP, Galveston, Texas.

Discussion to be opened by LESLIE M. SMITH, El Paso, Texas.

Hyperthermia Treatments in Dermatology.

ELMORE B. TAUBER and LEON GOLDMAN, Cincinnati.

Discussion to be opened by PAUL A. O'LEARY, Rochester, Minn., and JULIEN E. BENJAMIN, Cincinnati.

Dermatofibrosarcoma Protuberans, with a Report of Six Cases (Lantern Demonstration).

GEORGE W. BINKLEY, Cleveland.

Discussion to be opened by JOHN H. LAMB, Oklahoma City.

Thursday, May 18—2 p. m.**Corneal Examination and Slit Lamp Microscopy in Diagnosis of Late Congenital Syphilis, Especially in Adults (Lantern Demonstration).**

JOSEPH V. KLAUDER and ALFRED COWAN, Philadelphia.

Discussion to be opened by JAMES R. DRIVER, Cleveland.

A Study of Discrepancies in Serologic Reports: The "Positive Hinton-Negative Wassermann" Problem (Lantern Demonstration).

G. MARSHALL CRAWFORD and LEON F. RAY, Boston.

Discussion to be opened by UDO J. WILE, Ann Arbor, Mich.

The Value and Use of Mapharsen by the General Practitioner in Office Practice (Lantern Demonstration).

CHARLES R. REIN and FRED WISE, New York.

Discussion to be opened by GERSH D. ASTRACHAN, New York.

Granuloma Inguinale: Notes on Its Clinical Syndrome; Protozoan Nature of the Disease; Experimental Production (Lantern Demonstration).

ROBERT B. GREENBLATT, Augusta, Ga.

Discussion to be opened by HARRY M. ROBINSON, Baltimore.

The Action of Sodium Thiosulfate, Thiophenylsulfonic Acid and Formaldehyde Sulfoxylate in Arsenical and Mercurial Poisoning in Rabbits.

KATHLEEN B. MUIR, EVANGELINE STENHOUSE and S. WILLIAM BECKER, Chicago.

Discussion to be opened by CHARLES C. DENNIE, Kansas City, Mo.

Sugar Metabolism of the Skin (Lantern Demonstration).

THEODORE CORNBLEET, Chicago.

Discussion to be opened by HERMAN SHARLIT, New York.

Metabolic Studies in Patients with Pemphigus (Lantern Demonstration).

JOHN H. TALBOTT, Boston.

Discussion to be opened by RICHARD S. WEISS, St. Louis, and C. GUY LANE, Boston.

Friday, May 19—2 p. m.**Election of Officers****Dermatitis of the Ears (Lantern Demonstration).**

H. L. WILLIAMS JR., HAMILTON MONTGOMERY and WILLIAM N. POWELL, Rochester, Minn.

Discussion to be opened by JAMES HERBERT MITCHELL, Chicago.

Pruritus Ani et Vulvae (Lantern Demonstration).

WILLIAM HOWARD HAILEY and HUGH E. HAILEY, Atlanta, Ga.

Discussion to be opened by CARL W. LAYMON, Minneapolis.

The Seneur-Usher Syndrome.

UDO J. WILE and HARRY L. ARNOLD JR., Ann Arbor, Mich.

Discussion to be opened by FRANCIS E. SENEUR, Chicago.

Generalized Herpes Zoster (Lantern Demonstration).

LESLIE P. BARKER, New York.

Discussion to be opened by NELSON PAUL ANDERSON, Los Angeles.

Poikiloderma (Lantern Demonstration).

ONIS G. HAZEL, Oklahoma City.

Discussion to be opened by FRED M. JACOB, Pittsburgh.

SECTION ON PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH

MEETS IN IVORY ROOM OF HOTEL JEFFERSON

OFFICERS OF SECTION

Chairman—I. C. RIGGIN, Richmond, Va.

Vice Chairman—H. S. DIEHL, Minneapolis.

Secretary—W. A. SAWYER, Rochester, N. Y.

Executive Committee—L. D. BRISTOL, New York; ROBERT T. LEGGE, Berkeley, Calif.; I. C. RIGGIN, Richmond, Va.

Wednesday, May 17—9 a. m.

Chairman's Address. I. C. RIGGIN, Richmond, Va.

Traumatic Heart Disease (Lantern Demonstration).

LOUIS F. BISHOP JR., New York

Some Peculiarities in the Geography of Cancer (Lantern Demonstration).

JOSEPH W. MOUNTAIN and HAROLD F. DORN, Washington, D. C.

The Hazards of Farming (Lantern Demonstration).

JOHN H. POWERS, Cooperstown, N. Y.

Depressed Skull Fractures (Lantern Demonstration).

MARK A. GLASER and FREDERICK P. SHAFER, Los Angeles.

Thursday, May 18—9 a. m.

A Study of the Pneumonias with Reference to Overcrowding and Cross Infection (Lantern Demonstration).

JULIEN E. BENJAMIN, Cincinnati

Tuberculosis Among Hospital Personnel.

LEOPOLD BRAHDY, New York.

Tuberculosis Control. ROBERT E. PLUNKETT, Albany, N. Y.

The Intravenous Drip Method of Therapy Applied to Syphilis (Lantern Demonstration).

HAROLD T. HYMAN, LOUIS CHARGIN, JOHN L. RICE and WILLIAM LEFFER, New York.

The Relationship of Syphilis to Tuberculosis (Lantern Demonstration).

SAMUEL GOLDBLATT, Cincinnati

Friday, May 19—9 a. m.**Election of Officers**

Industrial Importance of Allergic Diseases to the Southern Pacific Railroad Company (Lantern Demonstration).

EDWARD MATZGER, San Francisco

Hard Facts About Psychiatry.

C. C. BURLINGAME, Hartford, Conn.

Present Status of Benzene. P. A. DAVIS, Akron, Ohio

Dermatitis Among Plate Printers (Lantern Demonstration).

PAUL A. NEAL, Washington, D. C.

Pollinosis as a Problem in Preventive Medicine (Lantern Demonstration).

R. V. ELLIS, Minneapolis.

SECTION ON UROLOGY

MEETS IN ASSEMBLY ROOM 3 OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

Chairman—WILLIAM P. HERBST, Washington, D. C.

Vice Chairman—GRAYSON L. CARROLL, St. Louis.

Secretary—VINCENT J. O'CONOR, Chicago.

Executive Committee—HENRY W. E. WALTHER, New Orleans;

ALBERT J. SCHOLL, Los Angeles; WILLIAM P. HERBST, Washington, D. C.

Wednesday, May 17—9 a. m.**SYMPOSIUM ON URINARY INJURIES**

Diagnostic and Operative Factors in Traumatic Rupture of the Kidney (Lantern Demonstration).

FRANKLIN FARMAN, Los Angeles.

Rupture of Kidney (Lantern Demonstration).

GEORGE C. PRATHER, Boston.

Injuries of the Ureter (Lantern Demonstration).

CARL F. RUSCHE, Los Angeles

Intraperitoneal and Extraperitoneal Rupture of the Urinary Bladder (Lantern Demonstration).

E. J. McCAGUE, Pittsburgh

Care of Traumatic Injuries of the Male Urethra (Lantern Demonstration).

WILLIAM L. HORNADAY, Des Moines.

Traumatic "Epididymo-Orchitis."

GEORGE H. EWELL, Madison, Wis.

Thursday, May 18—9 a. m.

- A New Method of Uretero-Intestinal Anastomosis with Utilization of Peritonum (Lantern Demonstration).
ROY E. BRACKIN, Kenilworth, Ill.
- Hypospadias (in the Male): The Operative Technic for the Correction of Penile Deformity and Reconstruction of the Urethra (Lantern Demonstration).
CHARLES M. McKENNA, Chicago.
- Chairman's Address: Renal Tuberculosis (Lantern Demonstration).
WILLIAM P. HERBST, Washington, D. C.
- Late Results Following Nephrectomy for Renal Neoplasm (Lantern Demonstration).
J. T. PRIESTLEY, Rochester, Minn.
- The Clinical Aspects of the Endocrine Function of the Testes in Man (Lantern Demonstration).
WILLIAM E. LOWER and E. P. McCULLAGH, Cleveland.
- The Endocrine Function of the Testes (Lantern Demonstration).
JAMES F. McCAHNEY, Philadelphia.

Friday, May 19—9 a. m.

- Election of Officers
- Genital Tuberculosis (Lantern Demonstration).
ELI A. MILLER, Denver, and M. J. LUSTOK, Spivak, Colo.
- Factors in Recurrence of Renal Calculi (Lantern Demonstration).
CHARLES C. HIGGINS, Cleveland.
- Calcium and Phosphorus Excretion on Patients with Urinary Calculi.
RUBIN FLOCKS, Iowa City.
- Do Alkalis Used in the Treatment of Peptic Ulcer Cause Kidney Stones? (Lantern Demonstration).
HERMAN L. KRETSCHEMER and RALPH C. BROWN, Chicago.
- The Treatment of Ureteral Calculus with Particular Reference to Transurethral Manipulation (Lantern Demonstration).
GERSHOM J. THOMPSON, Rochester, Minn.
- Ureteral Mcatotomy: Its Significance and Description of a New Technic (Lantern Demonstration).
JOHN DUFF, New York.

SECTION ON ORTHOPEDIC SURGERY

MEETS IN ASSEMBLY ROOM 4 OF MUNICIPAL AUDITORIUM

OFFICERS OF SECTION

- Chairman—OSCAR L. MILLER, Charlotte, N. C.
- Vice Chairman—ROBERT V. FUNSTEN, Charlottesville, Va.
- Secretary—GUY A. CALDWELL, New Orleans.
- Executive Committee—FREMONT A. CHANDLER, Chicago; JOHN DUNLOP, Pasadena, Calif.; OSCAR L. MILLER, Charlotte, N. C.

Wednesday, May 17—9 a. m.

- Excision of Patella in Cases of Hypertrophic Arthritis (Lantern Demonstration).
E. J. BERKHEISER, Chicago.
- Discussion to be opened by A. H. MEYER, Memphis, Tenn., and JACOB KULOWSKI, St. Joseph, Mo.
- Sympathicoblastoma: A Report of Four Cases (Lantern Demonstration).
FREMONT A. CHANDLER and JOHN R. NORCROSS, Chicago.
- Discussion to be opened by FRANK R. OBER, Boston, and G. K. CARPENTER, Nashville, Tenn.
- Regeneration of the Growth Epiphyses of Long Bones (Lantern Demonstration).
EDWARD L. COMPERE, SAMUEL W. BANKS and WILLIAM N. KRIGSTEN, Chicago.
- Discussion to be opened by WILLIS C. CAMPBELL, Memphis, Tenn., and ARTHUR T. LEGG, Boston.
- Tuberculosis of the Knee in Infancy and Childhood (Lantern Demonstration).
FRANCIS M. McKEEVER, Los Angeles.
- Discussion to be opened by W. P. BLOUNT, Milwaukee, and R. B. OSGOOD, Boston.
- Low Back Pain: Correlation of the Signs and Symptoms of the Various Noninfectious Lesions (Lantern Demonstration).
JOSEPH A. FREIBERG, Cincinnati.
- Discussion to be opened by PHILIP LEWIN, Chicago, and G. C. BATTALORA, New Orleans.
- The Cook Fenestrated Jacket for Correction of Scoliosis (Lantern Demonstration).
CARL E. BADGLEY and M. JOHN ROWE JR., Ann Arbor, Mich.
- Discussion to be opened by C. H. CREGO JR., St. Louis, and L. G. HOWARD, Boston.

Thursday, May 18—9 a. m.

- Reconstructive and Stabilizing Surgery in the Treatment of Residual Suppurative Arthritis of the Hip Joint: A Study of Forty-Five Unselected Cases (Lantern Demonstration).
HALFORD HALLOCK, New York.
- Discussion to be opened by J. ALBERT KEY, St. Louis, and FRANK D. DICKSON, Kansas City, Mo.

- Excision of Scapula: Report of a Case Showing Excellent Functional Result (Lantern Demonstration).
EDWIN W. RYERSON, Chicago.
- Discussion to be opened by J. W. SEVER, Boston, and ROLAND HAMMOND, Providence, R. I.
- Acute and Chronic Osteomyelitis: Bacteriologic, Pathologic and Clinical Studies (Lantern Demonstration).
A. R. SHANDS JR., Wilmington, Del., and LENOX D. BAKER, Durham, N. C.
- Discussion to be opened by JAMES B. WEAVER, Kansas City, Mo., and W. S. DUNCAN, Cleveland.
- Chairman's Address: Simplified Internal Fixation of Inlay and Onlay Bone Grafts (Lantern Demonstration).
OSCAR L. MILLER, Charlotte, N. C.
- Diagnosis and Treatment of Slipped Epiphyses (Lantern Demonstration).
RALPH K. GHORMLEY and ROBERT D. FAIRCHILD, Rochester, Minn.
- Discussion to be opened by PHILIP D. WILSON, New York, and J. T. NICHOLSON, Philadelphia.
- Imbalance of the Foot (Lantern Demonstration).
REX L. DIVELEY, Kansas City, Mo.
- Discussion to be opened by J. E. M. THOMSON, Lincoln, Neb., and H. R. BOHLMAN, Baltimore.

Friday, May 19—9 a. m.

- Election of Officers
- Compression Reconstruction of Recent Intracapsular Femoral Neck Fractures: Internal Fixation by Universal Length Z Nail (Lantern Demonstration).
VERNON P. THOMPSON and JOHN S. STEPHENS, Los Angeles.
- Discussion to be opened by V. L. HART, Minneapolis, and F. W. CARRUTHERS, Little Rock, Ark.
- Severe Fractures of the Upper Ulna (Lantern Demonstration).
W. K. WEST, Oklahoma City.
- Discussion to be opened by J. T. O'FERRALL, New Orleans, and EUGENE M. REGEN, Nashville, Tenn.
- A Study of Amputations in the Lower Extremities (Lantern Demonstration).
PAUL C. COLONNA and FREDERICK H. VOM SAAL, Oklahoma City.
- Discussion to be opened by R. G. PACKARD, Denver, and R. M. CLEARY, Buffalo.
- Sideswipe Fractures at the Elbow (Lantern Demonstration).
ROBERT D. SCHROCK, Omaha.
- Discussion to be opened by G. O. EATON, Baltimore, and R. C. ROBERTSON, Chattanooga, Tenn.
- Primary Operative Reduction of Fractures of Long Bones as a Method of Choice: An Evaluation of Principles (Lantern Demonstration).
CLAY RAY MURRAY, New York.
- Discussion to be opened by H. EARLE CONWELL, Birmingham, Ala.; M. L. KLINEFELTER, St. Louis, and PAUL B. MAGNUSON, Chicago.
- Treatment of Supracondylar Fractures of the Femur by Manipulation and Acute Flexion (Lantern Demonstration).
L. D. SMITH, Milwaukee.
- Discussion to be opened by J. D. WILSON, Columbus, Ohio, and C. F. CLAYTON, Fort Worth, Texas.

SECTION ON GASTRO-ENTEROLOGY AND PROCTOLOGY

MEETS IN IVORY ROOM OF HOTEL JEFFERSON

OFFICERS OF SECTION

- Chairman—DESCUM C. McKENNEY, Buffalo.
- Vice Chairman—A. H. AARON, Buffalo.
- Secretary—J. A. BARGEN, Rochester, Minn.
- Executive Committee—LOUIS A. BUTE, Rochester, Minn.; HENRY L. BOCKUS, Philadelphia; DESCUM C. McKENNEY, Buffalo.
- The annual banquet of the section will be held on Thursday, May 18, 6:30 p. m., in the Crystal Room of the Hotel Jefferson.

Wednesday, May 17—2 p. m.

AIDS TO THE MANAGEMENT OF PEPTIC ULCER

- A Comparative Study of Methods Utilized to Determine the Presence of Ulceration in the Gastrointestinal Tract (Lantern Demonstration).
A. L. LEVIN and MORRIS SHUSHAN, New Orleans.
- Peptic Ulcer Treated by Posterior Pituitary Preparations: Clinical and Experimental Observations.
M. HILL METZ, ROBERT W. LACKEY, P. E. WIGBY, A. B. SMALL and C. O. PATTERSON, Dallas, Texas.

The Use of Hydrated Trisilicate of Magnesium for Peptic Ulcer (Lantern Demonstration).

MANFRED KRAEMER, Newark, N. J.
Discussion to be opened by WALTER L. PALMER, Chicago,
and MAURICE FELDMAN, Baltimore.

THE ESOPHAGUS

The Management of Benign Strictures of the Esophagus (Motion Picture Demonstration).

PORTER P. VINSON, Richmond, Va.
Discussion to be opened by JOHN H. FITZGIBBON, Portland, Ore.

INTESTINAL PARASITES

The Incidence and Results of Treatment in Subclinical Amebiasis.

FRANK H. CONNELL and HARRY T. FRENCH, Hanover, N. H.

Discussion to be opened by JAMES L. BORLAND, Jacksonville, Fla.

SYSTEMIC CONDITIONS WITH GASTROINTESTINAL SYMPTOMS

The Role of the Gastrointestinal Tract in the Production of Cardiac Symptoms (Lantern Demonstration).

LISTER M. MORRISON and WILLIAM A. SWALM, Philadelphia.

Psychosomatic Factors Concerned in Recurrent Diarrhea.

SIDNEY A. PORTIS and JACOB KASANIN, Chicago.

Geriatrics: Its relation to an Adequate Energy Producing and Protective Diet (Lantern Demonstration).

E. L. TUOHY, Duluth, Minn.

Discussion to be opened by SCALE HARRIS, Birmingham, Ala., and WILLIAM EGBERT ROBERTSON, Philadelphia.

Thursday, May 18—2 p. m.

Election of Officers

THERAPEUTIC ADVANCES IN DISEASE OF THE ILEOCECAL REGION

Appendicitis: Newer Methods of Treatment (Lantern Demonstration).

JOHN S. HORSLEY JR., GUY W. HORSLEY and J. SHELTON HORSLEY, Richmond, Va.

The Management of Patients with Diffuse Peritonitis Caused by Perforated Appendicitis (Lantern Demonstration).

THEW WRIGHT, A. H. AARON, J. SUTTON REGAN and ELMER MILCH, Buffalo.

Ileocecal Spasm: The Cause for the Appendicular Syndrome (Lantern Demonstration).

BENJAMIN M. BERNSTEIN, Brooklyn.

Discussion to be opened by J. DEVL. HART, Durham, N. C.

STUDIES ON CANCERS AT DIFFERENT AGES

The Importance of Carcinoma as a Cause of Indigestion (Lantern Demonstration).

ANDREW B. RIVERS, Rochester, Minn.

Cancer of the Rectum in Young Persons (Lantern Demonstration).

CURTICE ROSSER and J. G. KERR, Dallas, Texas.

Discussion to be opened by BURRILL B. CROHN and HENRY A. RAFSKY, New York.

IMPORTANT POINTS IN THE MANAGEMENT OF NEOPLASMS OF THE LARGE INTESTINE

Polyps of the Colon and Rectum and Their Relation to Malignancy (Lantern Demonstration).

NEIL W. SWINTON and SHIELDS WARREN, Boston.

The Lynch Versus the Miles Operation (Lantern Demonstration).

JEROME M. LYNCH and G. JOHNSON HAMILTON, New York.

The Advantages of Perineal Over Abdominal Colostomy with Technic for Transferring the Abdominal Opening to the Perineum (Lantern Demonstration).

W. WAYNE BABCOCK, Philadelphia.

Discussion to be opened by CLAUDE F. DIXON, Rochester, Minn.

Friday, May 19—2 p. m.

JOINT MEETING WITH SECTION ON RADIOLOGY IN BALL ROOM OF HOTEL DE SOTO

THE SMALL INTESTINE: ANATOMIC, ROENTGENOLOGIC, PATHOLOGIC AND CLINICAL CONSIDERATIONS

The Roentgen Anatomy of the Small Intestine (Lantern Demonstration).

GEORGE W. CHAMBERLIN, Philadelphia.

The Roentgenologic Manifestations of Non-Neoplastic Lesions of the Small Intestine (Lantern Demonstration).

HARRY M. WEBER, Rochester, Minn.

The Small Intestine in Nutritional Deficiency (Lantern Demonstration).

DAVID ADLERSBERG and MICHAEL WEINGARTEN, New York.

Epidemic Enteritis: Etiology and Relation to Other Infections of the Small Intestine (Lantern Demonstration).

E. C. ROSENOW, Rochester, Minn.

Clinical Aspects of Chronic Disorders of Small Intestine (Lantern Demonstration).

EVERETT D. KIEFER, Boston.

Discussion to be opened by T. GRIER MILLER, Philadelphia; SARA M. JORDAN, Boston, and ROSS GOLDEN, New York.

SECTION ON RADIOLOGY

MEETS IN BALL ROOM OF HOTEL DE SOTO

OFFICERS OF SECTION

Chairman—R. G. TAYLOR, Los Angeles.

Vice Chairman—MERRILL C. SOSMAN, Boston.

Secretary—JOHN T. MURPHY, Toledo, Ohio.

Executive Committee—ROSS GOLDEN, New York; B. R. KIRK-LIN, Rochester, Minn.; R. G. TAYLOR, Los Angeles.

Wednesday, May 17—2 p. m.

Experimental Peritonitis: Its Prevention by Roentgen Therapy (Lantern Demonstration).

W. A. ALTEMEIER and H. C. JONES, Detroit.

Visualization of the Chambers of the Heart, the Pulmonary Circulation and the Great Blood Vessels in Man: Further Observations (Lantern Demonstration).

GEORGE P. ROBB and ISRAEL STEINBERG, New York.

Chairman's Address: Anomalies of the Sacrolumbar Articulations (Lantern Demonstration).

R. G. TAYLOR, Los Angeles.

The Treatment of Carcinoma of the Ovary (Lantern Demonstration).

ROBERT I. WALTER, ARNOLD L. BACHMAN and WILLIAM HARRIS, New York.

Bronchiogenic Carcinoma: A Diagnostic Enigma (Lantern Demonstration).

EDWARD L. JENKINSON and ARTHUR F. HUNTER, Chicago.

Discussion to be opened by LEROY SANTE, St. Louis.

Angio-Endothelioma of Bone (Lantern Demonstration).

J. FLETCHER LUTZ and LEWIS C. PUSCH, York, Pa.

Thursday, May 18—2 p. m.

Election of Officers

Neurologic Aspects of Intervertebral Disk Protrusions (Lantern Demonstration).

R. GLEN SPURLING and F. KEITH BRADFORD, Louisville, Ky.

Myelography with the Use of Thorium Dioxide Sol as a Contrast Medium (Lantern Demonstration).

B. H. NICHOLS and WILLIAM A. NOSIK, Cleveland.

The Diagnosis of Intervertebral Disk Protrusions by Intraspinal Injection of Air.

W. EDWARD CHAMBERLAIN and BARTON R. YOUNG, Philadelphia.

The Roentgenologic Diagnosis of Intraspinal Protrusion of the Intervertebral Disks by Means of Radiopaque Oil (Lantern Demonstration).

JOHN D. CAMP, Rochester, Minn.

Protruded Intervertebral Disks, with a Note Regarding Hypertrophy of Ligamenta Flava (Lantern and Motion Picture Demonstration).

J. GRAFTON LOVE, Rochester, Minn.

Friday, May 19—2 p. m.

JOINT MEETING WITH SECTION ON GASTRO-ENTEROLOGY AND PROCTOLOGY

THE SMALL INTESTINE: ANATOMIC, ROENTGENOLOGIC, PATHOLOGIC AND CLINICAL CONSIDERATIONS

The Roentgen Anatomy of the Small Intestine (Lantern Demonstration).

GEORGE W. CHAMBERLIN, Philadelphia.

The Roentgenologic Manifestations of Non-Neoplastic Lesions of the Small Intestine (Lantern Demonstration).

HARRY M. WEBER, Rochester, Minn.

The Small Intestine in Nutritional Deficiency (Lantern Demonstration).

DAVID ADLERSBERG and MICHAEL WEINGARTEN, New York.

Epidemic Enteritis: Etiology and Relation to Other Infections of the Small Intestine (Lantern Demonstration).
E. C. ROSENOW, Rochester, Minn.
Clinical Aspects of Chronic Disorders of Small Intestine (Lantern Demonstration). EVERETT D. KIEFER, Boston.
Discussion to be opened by T. GRIER MILLER, Philadelphia; SARA M. JORDAN, Boston, and ROSS GOLDEN, New York.

SECTION ON MISCELLANEOUS TOPICS, SESSION ON ANESTHESIA

MEETS IN BALL ROOM OF HOTEL DESOTO

OFFICERS OF SECTION

Chairman—RALPH M. WATERS, Madison, Wis.

Secretary—CHARLES N. COMBS, Terre Haute, Ind.

Wednesday, May 17—9 a. m.

Chairman's Address. RALPH M. WATERS, Madison, Wis.
The Effect of Certain Anesthetics on the Blood (Lantern Demonstration). PAUL W. SEARLES, Buffalo.
Discussion to be opened by CHARLES J. BELLACH, Chicago.
The Principles of Inhalation Anesthesia for Thoracic Surgery. E. A. ROVENSTINE, New York.
Discussion to be opened by JOSEPH W. GALE, Madison, Wis.

Prevention of Ignition of Anesthetic Gases by Static Spark (Lantern Demonstration).

PHILIP D. WOODBRIDGE, Boston.

Discussion to be opened by EVERETT A. TYLER, Philadelphia, and RALPH M. WATERS, Madison, Wis.

Trichlorethanol: A Preliminary Clinical Report (Lantern Demonstration). PAUL M. WOOD, New York.

Discussion to be opened by P. K. KNOEFEL, Louisville, Ky.

Intravenous Pentothal (Lantern Demonstration).

HENRY S. RUTH, Merion Station, Pa., and RALPH M. TOVELL, Hartford, Conn.

Discussion to be opened by GEORGE J. THOMAS, Pittsburgh.

Acapnia Shock: Its Relation to Narcosis (Lantern Demonstration). M. H. SEEVERS, Madison, Wis.

Discussion to be opened by HENRY K. BEECHER, Boston.

Oxygen Tolerance Versus Oxygen Dosage.

JOHN H. EVANS, Buffalo.

Discussion to be opened by F. A. D. ALEXANDER, Albany, N. Y.

Direct Arterial and Venous Pressure Measurements During Clinical Anesthesia (Lantern Demonstration).

P. P. VOLPITTO, R. A. WOODBURY and W. F. HAMILTON, Augusta, Ga.

Discussion to be opened by JOHN S. LUNDY, Rochester, Minn.

THE SCIENTIFIC EXHIBIT

" . . . to teach them this art, if they should wish to learn it, without fee or stipulation . . . "

Two hundred and forty small "classrooms," all in session at the same time; a "faculty" of more than five hundred of the leading investigators, teachers and practitioners of medicine; a "student body" of seven or eight thousand physicians from the United States and other countries—that is the Scientific Exhibit of the American Medical Association as it will appear at the St. Louis Session.

The year 1939 marks the fortieth anniversary of the Scientific Exhibit. Credit for its establishment goes to members of the Indiana State Medical Association. In 1899 they brought to the meeting of the American Medical Association at Columbus, Ohio, a considerable amount of exhibit material from their own state meeting which had just taken place at Indianapolis. Such interest was created that a committee was appointed for the continuation of the feature. At first the exhibits were confined to specimens of pathologic anatomy, but in 1903 their scope was broadened to include all phases of medicine and the term "Scientific Exhibit" applied.

The Scientific Exhibit constitutes an intensive week of post-graduate medical instruction. The trustees of this unique educational institution are the Trustees of the American Medical Association, who appoint three of their own members as the "Committee on Scientific Exhibit" and appropriate many thousands of dollars annually for its maintenance. A strong advisory committee, together with representatives from the fifteen sections of the Scientific Assembly of the Association, insures a high standard of excellence from the educational standpoint.

Physicians are given an excellent opportunity in the Scientific Exhibit for study and conference. Demonstrators are on hand at all times to answer questions and explain the work portrayed. Many of the papers read before various sections of the Scientific Assembly are illustrated by exhibits, making it possible for the physician who has heard the report to come to the Scientific Exhibit for further information on the subject.

The fifteen sections of the Scientific Assembly are represented in the Scientific Exhibit, with exhibits grouped by specialties. The purpose of the meeting, however, is for the benefit of the physician in general practice rather than of the specialist, although the latter will find plenty to occupy his time, for each exhibit is presented by a specialist in one field or another.

There will be several interesting features at the St. Louis Session. The special exhibits on fractures and on anesthesia will include much practical material; the exhibit symposium

on heart disease will cover the subject quite completely; the exhibit symposium on medical education, hospitals and licensure is devoted largely to graduate medical education as it is conducted by different state medical associations. Motion picture programs will be conducted continuously and simultaneously by several of the sections in commodious areas adjacent to the exhibits.

Graduate medical education is the theme of the Scientific Exhibit. Nowhere is the Oath of Hippocrates better exemplified than by the participants in the Scientific Exhibit who give freely of their time and energy for the benefit of other physicians.

The Scientific Exhibit is located in the Convention Hall of the St. Louis Municipal Auditorium, on the same floor as the Opera House and on the floor above the Technical Exhibit. It is reached from the Technical Exhibit by ramps and elevators.

Admission to the Scientific Exhibit will be limited to persons wearing Fellowship or other badges of the convention and to guests to whom special cards of admission have been issued. The public will not be admitted to the Scientific Exhibit.

SPECIAL EXHIBIT ON ANESTHESIA

The exhibit on anesthesia is presented for the third time this year under the auspices of a committee appointed by the Committee on Scientific Exhibit of the Board of Trustees as follows: John S. Lundy, Rochester, Minn.; Henry S. Ruth, Philadelphia; Philip D. Woodbridge, Boston, and Ralph M. Waters, chairman, Madison, Wis.

An additional advisory committee is comprised of A. M. Caine, New Orleans; John Evans, Buffalo; A. E. Guedel, Los Angeles; Huberta M. Livingstone, Chicago; G. S. Mcclung, Oklahoma City; F. T. Romberger, Lafayette, Ind.; A. L. Schwartz, Cincinnati; L. F. Sise, Boston; B. C. Sword, New Haven, Conn.; G. J. Thomas, Pittsburgh; Dorothy Wood, San Francisco, and Paul M. Wood, New York.

The exhibit deals with the administration of anesthetics as under the following topics:

1. The airway.
2. Open drop technic.
3. Open and semiopen technics for administration of gases, and apparatus required.
4. Carbon dioxide absorption technic, and apparatus required.
5. Rectal technic.
6. Intravenous technic.
7. Various local and block technics.
8. Principles and method of record keeping.

Demonstrations will be given continuously throughout the week, and motion pictures will be shown in an area adjacent to the exhibit. A pamphlet will be distributed.

The following anesthetists will take part in the demonstration:

John A. Adriani, New York, N. Y.	Urban Eversole, Boston, Mass.
F. A. D. Alexander, Albany, N. Y.	B. Herzberg, Phoenix, Ariz.
Virginia Appar, New York, N. Y.	J. H. Hutton, Portland, Ore.
Henry Beecher, Boston, Mass.	J. Kreiselman, Washington, D. C.
C. M. Betlach, Chicago, Ill.	S. S. Lyons, New York, N. Y.
H. F. Bishop, Valhalla, N. Y.	W. B. Neff, San Francisco, Calif.
R. F. Bonham, Houston, Texas	George Paschall, San Antonio, Tex.
R. F. Corwin, Dayton, Ohio	G. M. Rosenheimer, South Bend, Ind.
S. C. Cullen, Iowa City, Iowa	P. W. Searles, Buffalo, N. Y.
Hugh Cunningham, Milwaukee, Wis.	Gladys Smithwick, Lexington, Ky.
Lilly Dismuke, New Orleans, La.	J. A. Stiles, San Francisco, Calif.
H. E. Doudna, Oklahoma City, Okla.	T. L. Tidmore, Atlanta, Ga.
W. B. Draper, Denver, Colo.	R. M. Tovell, Hartford, Conn.
H. S. Eggers, Louisville, Ky.	P. P. Volpitta, Augusta, Ga.
	R. J. Whitacre, E. Cleveland, Ohio

SPECIAL EXHIBIT ON FRACTURES

The exhibit on fractures is continued again this year along somewhat the same lines as last year. The special exhibit committee appointed by the Committee on Scientific Exhibit of the Board of Trustees is composed of the following: Frank D. Dickson, Kansas City, Mo.; Walter Estell Lee, Philadelphia; Kellogg Speed, chairman, Chicago.

The following subjects will be considered:

1. Plaster of Paris: Making and Storing.
2. Application of Plaster of Paris.
3. Fracture of the Lower End of the Radius.
4. Fracture of the Spine—Compression.
5. Supracondylar Fracture of the Humerus.
6. Emergency Treatment of Fractures of the Lower Extremity.

Demonstrations will be given continuously throughout the week. A pamphlet has been prepared for distribution in connection with the exhibit.

The following physicians will take part in the demonstration:

George Apfelbach, Chicago, Ill.	Earl D. McBride, Oklahoma City, Okla.
G. W. Batuan, Indianapolis, Ind.	Duncan McKeever, Kansas City, Mo.
G. C. Battalora, New Orleans, La.	Arthur R. Metz, Chicago, Ill.
Carl E. Black, Jacksonville, Ill.	Herbert P. Miller, Rock Island, Ill.
Mat Bloomfield, Joliet, Ill.	R. J. Mroz, Rockford, Ill.
W. P. Blount, Milwaukee, Wis.	Frank G. Murphy, Chicago, Ill.
George K. Carpenter, Nashville, Tenn.	Jesse Nicholson, Philadelphia, Pa.
Dwight F. Clark, Evanston, Ill.	L. M. Overton, Des Moines, Iowa
C. F. Clayton, Fort Worth, Texas	E. Payne Palmer, Phoenix, Ariz.
George J. Curry, Flint, Mich.	Francis G. Pipkin, Kansas City, Mo.
R. J. Dietrich, Fort Scott, Kans.	Darwin B. Pond, Chicago, Ill.
James R. Elliott, Kansas City, Mo.	Willis J. Potts, Oak Park, Ill.
Egbert G. Fell, Chicago, Ill.	M. E. Pusitz, Topeka, Kans.
C. R. G. Forrester, Chicago, Ill.	Sheppard Remington, Chicago, Ill.
Clarence B. Francisco, Kansas City, Mo.	Dean L. Rider, Chicago, Ill.
Alfred E. Gallant, Los Angeles, Calif.	R. C. Robertson, Chattanooga, Tenn.
Halford Hallock, New York, N. Y.	Charles Rombold, Wichita, Kans.
Maxwell Harbin, Cleveland, Ohio	L. D. Smith, Milwaukee, Wis.
V. L. Hart, Minneapolis, Minn.	Charles A. Stone, St. Louis, Mo.
Frederick A. Jostes, St. Louis, Mo.	W. G. Stuck, San Antonio, Tex.
M. L. Klinefelter, St. Louis, Mo.	Henry B. Thomas, Chicago, Ill.
Jacob Kulowski, St. Joseph, Mo.	John R. Tobin, Elgin, Ill.
James W. Martin, Omaha, Neb.	D. R. Ulmer, Terre Haute, Ind.
Thomas E. Meany, Chicago, Ill.	H. W. Virgin, Jr., Madison, Wis.
	W. K. West, Oklahoma City, Okla.
	C. E. Yount, Prescott, Ariz.

SECTION EXHIBITS

Section on Practice of Medicine

The Section on Practice of Medicine, in addition to a large number of exhibits on various phases of internal medicine, presents groups of exhibits on arthritis, on the endocrines and on pneumonia. The section is likewise contributing to the Exhibit Symposium on Heart Disease. The representative to the Scientific Exhibit from the Section on Practice of Medicine is Fred M. Smith, Iowa City.

ROBERT M. STECHER, City Hospital, Cleveland:

Heberden's Nodes; The Incidence of Hypertrophic Arthritis of the Fingers: Exhibit of photographs, charts and explanatory matter illustrating the clinical appearance of Heberden's nodes and showing the incidence of the disease; incidence analyzed by race, sex, age and occupation; two families with five and four siblings having severe Heberden's nodes presented; from the incidence of the disease for the age, sex and degree of severity of the condition for each of these individuals the probability of such family involvement has been calculated; a strong familial susceptibility is demonstrated.

OLIVER ABEL JR. and WALTER J. SIEBERT, St. Louis:

Fibrositis; The Chief Cause of Pain in Rheumatism: Exhibit of slides and charts showing laboratory data and roentgen studies; treatment by vaccines, physical therapy and the like, with results of treatment; associated fibrositis, the principal cause of pain in hypertrophic osteoarthritis.

K. K. SHERWOOD, Seattle.

Diagnosis of Chronic Arthritis: Exhibit of colored drawings and photomicrographs illustrating the cardinal differences between hypertrophic and atrophic arthritis; analysis of the symptoms in a series of 250 cases of atrophic and 250 cases of hypertrophic arthritis arranged to emphasize the points of differentiation; physical changes similarly compared emphasizing the different joint distribution of the disease; analysis of the symptoms of physical changes of 250 patients who thought they had rheumatism but in whom the main disease was proved non-arthritic, emphasizing the frequent points of differentiation; summary of the symptoms and signs of adult tuberculosis of the bones, of metastatic tumors of the bones, of primary bone tumors and of Paget's disease.

F. LOWELL DUNN and E. E. SIMMONS, Omaha:

Fever Therapy in Rheumatic Fever: Exhibit of transparent charts and photographs of the results of fever therapy in rheumatic fever, including the effect on sedimentation rate and rheumatic carditis; motion picture of technic of fever therapy with Kettering type of cabinet, and of cases of rheumatic carditis.

ELLIOTT P. JOSLIN and HOWARD F. ROOT, Boston, with LOUIS I. DUBLIN and HERBERT H. MARKS, New York:

The Current Diabetes Situation: Exhibit of charts of existing trends in the incidence, diagnosis, prognosis, mortality and treatment of diabetes and its complications with especial emphasis on the prevention and early detection of the disease.

ELMER L. DEGWON, JOHN E. HARRIS and E. D. PLASS, State University of Iowa, University Hospitals, Iowa City:

Preservation of Blood for Transfusion: Exhibit of specimens of human blood drawn and stored in Iowa City and subsequently transported to St. Louis; rates of hemolysis in different preservatives are demonstrated; colored charts depicting the following chemical and physical changes at various ages of storage: (1) hemoglobin in plasma, (2) potassium in plasma, (3) dextrose content of plasma, (4) specific conductance of plasma, (5) pH of plasma, (6) respiratory activity of erythrocytes, (7) studies on blood preserved anaerobically, the optimum conditions and preservatives for storage.

J. RUSSELL TWISS, R. FRANKLIN CARTER and CARL H. GREENE, New York:

Biliary Colic: Etiology, Diagnostic Significance and Treatment: Exhibit showing that intermittent attacks of acute pain originating in the biliary tract are usually considered to be caused by gallstones, but experimental work and clinical experience have proved that colic may occur without stones; recurrent colic following cholecystectomy constitutes a major problem in the management of disease of the biliary tract; study of biliary colic has therefore been made which includes a review of recent concepts concerning its physiologic origin; charts are presented summarizing the clinical and operative conditions in 140 cases of biliary colic in patients with and without gallstones; similar charts are presented of forty cases presenting colic following cholecystectomy; an analysis of the methods of determining the cause of the colic and its treatment are given in each group with general conclusions based on these observations.

W. M. FOWLER and ADELAIDE P. BARER, University Hospitals, Iowa City:

Metabolism and Therapeutic Use of Iron: Exhibit of drawings, charts and graphs presenting data on the metabolism of iron, showing the amount absorbed and utilized with varying dosages and the therapeutic effect in certain types of anemia.

JOHN D. CURRENCE, New York Post-Graduate Medical School and Hospital, Columbia University, New York:

Hyperpyrexia: Exhibit of charts depicting factors in fever therapy such as rationale, indications, contraindications, physiologic effects, methods of application, complications of hyperpyrexia, preparation of patient, pathologic changes in fatal cases, mechanism of shock caused and its treatment, and specific applications.

ROBERT OLESEN, U. S. Public Health Service, Washington, D. C.:

Pneumonia Control: Exhibit of posters depicting by pictorial and graphic means the principal points in the control of pneumonia.

M. HERBERT BARKER, the Department of Medicine of Northwestern University Medical School, and O. H. ROBERTSON, the Department of Medicine, the University of Chicago, Chicago.

Pneumonia: Exhibit reviewing the modern concept of pneumonia, its etiology, pathogenesis, pathology, epidemiology, general and specific therapy in detail and the Illinois state control program; presentation by means of models, roentgen studies, photomicrographs, illustrative placards and motion pictures.

DAVID J. COHN, Michael Reese Hospital, Chicago:

The Biology, Chemistry and Physics of Oxygen Therapy: Exhibit of charts and mechanical demonstrations illustrating the fundamental principles underlying the therapeutic administration of oxygen, such as the partial pressure relationships between the gases in the atmosphere, the alveoli, the blood and the tissues, as well as the chemistry of the hemoglobin-oxygen-carbon dioxide cycle; charts and models illustrating the basic physical and engineering principles, knowledge of which is necessary for the scientific construction of oxygen therapy apparatus, including the laws of heat transfer, hygrometry and the diffusion of gases in the atmosphere and through materials; methods of gas analysis in the air and in the blood and tissues.

WILLIAM WASHINGTON GRAVES, St. Louis University School of Medicine, St. Louis:

Human Constitution: New Approaches to the Problems (Inherited Variations and "The Age-Incidence" Principle): Exhibit dealing with new approaches to the problems of human constitution based on (1) simple classifications of variations peculiar to inherited characters of structure, function, measurements and indexes; (2) the application of "the age-incidence principle of investigation" in qualitatively evaluating them; (3) a summary of results derived from the application of the author's classification of human scapulae and (4) the classification of other inherited variations which, when adequately investigated, may become, like scapular types, useful in the problems of human constitution as expressed in inherited predisposition to health or disease and inherited capacities for educability, adaptability in general and longevity.

HAYNES H. FELLOWS and WILLIAM H. ORDWAY, Metropolitan Life Insurance Company, New York:

Pulmonary Tuberculosis; A Long Range Program for Control Among Personnel: Exhibit of (1) case finding with description of the routine and periodic search for early cases of pulmonary tuberculosis among employees and applicants for employment, with special emphasis on the experience with fluoroscopy; (2) sanatorium care for the patient until he is ready to return to work; (3) rehabilitation by restoring patients to their former jobs or placing them in similar work; (4) results obtained in each phase of this program; influence of certain factors on the working capacity subsequent to discharge, namely, stage of tuberculosis on admission to the sanatorium and condition on discharge; mortality rates subsequent to discharge from the sanatorium as related to these factors.

G. O. BROUN, K. R. ANDREWS and M. J. HUBER, St. Louis University School of Medicine, St. Louis:

Prevention of Cholesterol Atherosclerosis in the Rabbit; Comparison of Preventive Action of Lipocaic and Choline: Exhibit of (a) gross specimens of the aorta of rabbits fed normal diet, fed high cholesterol diet, fed high cholesterol diet plus lipocaic in varying amounts and fed high cholesterol diets and choline in varying amounts; (b) photomicrographs of aorta of same series of animals; (c) charts showing blood cholesterol changes of the same series of animals.

AUGUST A. WERNER, St. Louis:

Sex Hormones, Clinical Studies: Exhibit showing the effects of the sex-related hormones on human beings, including the production of the growth phase in the endometrium of castrate women by administration of theelin (estrogenic substance) and the development of the premenstrual endometrium in castrate women by injections of theelin and progesterone; the syndrome

complained of by castrates, women having hypo-ovarianism, the menopause and involutinal melancholia; the male climacteric and its treatment with testosterone propionate; cryptorchidism and its treatment with anterior pituitary gonadotropic extract and anterior pituitary-like substance.

ROBERT E. SCHLUETER and ETHEL A. WASHBURN, St. Louis:

Medical History: Exhibit of pictures and other objects of importance in medical history pertaining to early medicine in St. Louis and Missouri.

HENRY H. TURNER, Oklahoma City:

Clinical Endocrinology: Exhibit of photographs illustrating various accepted types of endocrinopathies and the results of treatment, a syndrome of infantilism, webbed neck and cubitus valgus; results of some original work in the treatment of hypogonadism with testosterone propionate; effects of the anterior pituitary-like substances in the treatment of acne and cretinism, some of which have been observed and treated over a period of from ten to twelve years, and numerous other clinical endocrinopathies.

BENSON BLOOM and C. S. KIBLER, Tucson, Ariz., and S. J. GRAUMAN, Milwaukee:

Potassium in Hay Fever: Exhibit of charts showing effect of potassium chloride in various allergic conditions; demonstration of effect of potassium chloride on hay fever.

DANIEL L. SEXTON, St. Louis:

Hormone Treatment in Cryptorchidism and Hypogonitalism: Exhibit of cases of cryptorchidism and hypogonitalism in boys ranging in age from 5 to 23 years; comparison of the results of treatment with the anterior pituitary-like hormone (A. P. L.) and the male sex hormone (testosterone propionate).

Section on Surgery, General and Abdominal

The Section on Surgery, General and Abdominal, in addition to its other exhibits, is presenting a group of exhibits on cancer, together with a continuous motion picture on various surgical subjects in an adjoining area. The representative from this section to the Scientific Exhibit is Grover C. Penberthy, Detroit.

CONRAD J. BAUMGARTNER, Los Angeles:

Lesions of the Neck: Exhibit showing mouldages of lesions of the neck; models made primarily to be used for teaching purposes and as a supplement and substitute for clinical material accompanying lectures on lesions of the neck.

WALTER M. BOOTHBY, C. W. MAYO, W. R. LOVELACE and A. H. BULBULIAN, Rochester, Minn.:

The Use of Oxygen in Medicine, Surgery and Aviation; Historical Development; A New Method of Administration: Exhibit of photographs illustrating the historical development of oxygen therapy and a detailed description of a new type of simple inhalation apparatus by means of which oxygen can be administered efficiently and economically either in the home or in the hospital; the value of high concentrations of oxygen approximating 100 per cent in contrast to the usual well known utilization of concentrations of from 50 to 60 per cent; it is of special value in pulmonary embolism, coronary thrombosis, post-surgical and traumatic shock, preventing headache following encephalography, relieving abdominal distention and aiding in the control of gas gangrene and tetanus.

FRANK J. TAINTER, St. Louis University School of Medicine, St. Louis:

Oral and Plastic Surgery: Exhibit of wax casts of faccs; drawings of plastic operations; magic lantern slides of bone grafts of the jaw.

CHARLES F. SHERWIN and A. M. TRIPOLI, St. Louis University School of Medicine, St. Louis:

General, Plastic and Tumor Surgery: Exhibit of photographs and drawings of interesting surgical cases, plastic surgery and tumors; repair of old muscle tendon avulsions, congenital diaphragm of duodenum, plastic reconstruction of lower lip; experimental pancreatic surgery.

HARRY E. MOCK and John L. LINDBQUIST, Chicago:

Skull Fractures and Cerebral Injuries: Exhibit of charts, plaster models, paintings and drawings and roentgenograms depicting the management of skull fractures and cerebral

injuries, based on a review of proved skull fractures; simple methods and necessary views to be taken to demonstrate the presence of a skull fracture; cerebral pathologic changes following injury; diagnosis of conditions causing prolonged unconsciousness.

WILLIAM T. COUGHLIN, St. Louis University School of Medicine, St. Louis:

Correction of Deformities of Hard and Soft Parts of Face: Exhibit of drawings, photographs, transparencies, plaster of paris impressions, apparatus and the like showing the steps in the various procedures necessary for the repair of defects of the bony skeleton and soft parts of the face.

JAMES L. MUMF, St. Louis University School of Medicine, St. Louis:

Lobectomy for Bronchiectasis: Exhibit of roentgen films of the chest showing preoperative and postoperative bronchography, case histories (on transparencies), photographs and photomicrographs of pathologic specimens.

HILGER PERRY JENKINS, LEO HRODINA and FOREST M. SWISHER, Chicago:

Comparative Study of Catgut and Silk: Exhibit of transparencies of photographs and photomicrographs demonstrating a histologic study of the reaction of the tissues to silk and to different kinds of catgut carried out from specimens removed from patients at operation or obtained at autopsy; specimens obtained from implants of assorted suture material in abdominal muscles of dogs; the rate of healing of wounds sutured with catgut and silk in the presence of contamination; osteogenesis in healed laparotomy incisions of patients.

CLAIRE L. STRATH and E. HOYT DEKLEINE, Detroit:

Plastic Surgery in Children: Exhibit of enlarged photographs depicting various deformities occurring in children and the results obtained by plastic procedures, with inserts and captions describing the technic used to accomplish the result; demonstration of the great advantage of operating on childhood deformities as early as practicable to minimize or avoid the inferiority complexes which so often develop in these children and sometimes produce marked personality changes.

ROBERT ELMAN, CHARLES L. HOAGLAND, L. H. HEMPLEMANN JR. and WILSON G. BROWN, Washington University School of Medicine, St. Louis:

Acute Pancreatic Disease: Exhibit demonstrating a rapid clinical method for the detection of acute pancreatic disease by measuring the concentration of blood amylase; curves showing the behavior of blood amylase during the course of the disease; plastic models showing the relation of the pancreatic and bile ducts in the human being, illustrating the probable pathogenesis; charts and specimens suggesting the appropriate treatment and the importance of differentiating pancreatic necrosis from transient inflammation.

ALBERT BEHREND, HELENA E. RIGGS, MOSES BEHREND and JEFFERSON H. CLARK, Philadelphia:

Cerebral Complications Following Surgical Operations: Exhibit showing a full length human figure with organs in situ; photomicrographic colored transparencies; legends of explanation printed.

WILLIAM E. HOWES, JOSEPH TENOPYR, W. W. HALA, W. P. CORRIERO and IRVING SILVERMAN, Calcedonian Hospital, Brooklyn.

Organization and Development of a Tumor Clinic in a Private Voluntary Hospital (100 Beds): Exhibit of charts showing personnel; records; apparatus, including surgical, laboratory, roentgen therapy and radium therapy requirements; biopsy, with two unique types of biopsy needles developed in the clinic; photomicrographs showing typical sections taken with these needles from breast, liver, lung and in some cases before and after irradiation; mortality statistics, including all cases enrolled in the two and one-half years since organization.

LOUIS H. JORSTAD and BRUCE C. MARTIN, St. Louis:

Tumors of the Head and Neck—Diagnosis and Treatment: Exhibit of moulages in natural colors of actual cases of benign and malignant tumors of the mouth, lip and face, demonstrat-

ing methods of treatment by radium and surgery, showing half of the face and corresponding half of the oral cavity sufficient for orientation; cases for surface and interstitial radium; procedures for immediate reconstruction of defects in selected cases; resection of lymph bearing tissue of the neck-draining areas of the head depicted in moulage; roentgenograms of benign and malignant tumors of the bones of the skull; photomicrographs of each type of lesion and a minimum of descriptive material.

W. E. ADAMS, Chicago:

Surgical Treatment of Intrathoracic Tumors: Exhibit of experimental and clinical studies, which include tumors involving most structures of the chest; i. e., chest wall, mediastinum, lung and esophagus.

WILLIAM J. HOFFMAN, New York:

Cancer; Its Treatment by Surgery and Irradiation: Exhibit of transparencies illustrating various types of cancer of the skin, lip, tongue, tonsil, hard palate, cheek, ear, nose, neck, breast, hands, lymph nodes of the neck, axilla and groin, and their treatment by surgery, irradiation and combinations of the two; indications for surgery and for irradiation illustrated and emphasized.

JEROME M. LYNCH and G. JOHNSON HAMILTON, New York:

Carcinoma of the Rectum and Sigmoid: Exhibit of charts, drawings, transparencies and photomicrographs depicting the manner of metastatic spread and the danger of biopsy; an operation is suggested which eradicates these danger points but still has a low mortality, illustrated by animated drawings and photographs of end results; various stages in the development of carcinoma are shown.

V. P. BLAIR, JAMES BARRETT BROWN and LOUIS T. BYARS, Washington University School of Medicine, St. Louis:

Cancer of the Mouth and Face: Exhibit of photographs showing lesions and diagnostic points; plans of treatment of typical instances.

EVARTS A. GRAHAM and BRIAN BLADES, Washington University School of Medicine, St. Louis:

Thoracic Surgery: Exhibit showing new developments in thoracic surgery, illustrated with photographs, charts, etc.

EARL C. PADGETT, Kansas City, Mo.:

The Colibrated Skin Graft; A New Principle and a New Type of Graft: Exhibit of transilluminated films depicting typical operative results; demonstration of a new skin grafting machine; method of cutting skin in one sheet of absolutely uniform thickness from any area of the body in any pattern and of any thickness desired; motion picture demonstration.

IRWIN SCHULZ, W. P. BLOUNT, CHARLES FIDLER, G. WILLIAM FOX, ROBERT MONTGOMERY, ARTHUR A. SCHAEFER, A. C. SCHMIDT, H. C. SCHUMM and STANLEY J. SEEGER, Milwaukee Children's Hospital, Milwaukee:

Fractures in Children; Principles of Treatment: Exhibit of photographs, roentgenograms, diagrams and charts presenting an end result study of fractures of the humerus, elbow, forearm, femur and tibia in children; statistical summaries of the incidence, location and results; roentgenograms of representative cases; photographs of methods and comments regarding principles of treatment. The principles of treatment of fractures in adults cannot be applied to children; open reduction is contraindicated in most types of fracture and is urgently needed in others; adaptive changes which occur with growth must be fully appreciated in treating fractures in children.

BERNHARD STEINBERG, Toledo Hospital, Toledo, Ohio:

Stages in Peritonitis—Based on Defense Mechanism in Relation to Treatment: Exhibit showing that general peritonitis is divided into three stages: the primary stage in which the various defenses, cellular and humoral, are capable of mobilization (preventive treatment designed to mobilize effectively these elements is presented and a procedure outlined for a ready recognition); the second stage, one of bacterial multiplication and toxin production in which the defense mechanism is inhibited or paralyzed and the treatment of this stage is indicated; the third stage, one of irrevocable damage.

HAROLD M. TRUSLER and JAMES F. GLORE, Indiana University Medical Center, Indianapolis:

Treatment of Burns and the Repair of Burn Scar Deformities: Exhibit of charts, illustrations, and photographs concisely and coherently portraying four important phases in the treatment of major burns: (1) treatment of burn shock; (2) initial treatment of burned areas; (3) treatment of granulation tissue in preparation for skin grafting; (4) plastic repair of deformities and contractures due to burn scars, including illustrations of split skin grafting, Z-plasty, pedicle or rolled flap reconstruction and other major reconstructive surgical procedures.

R. H. JACKSON, J. N. SISK and A. S. JACKSON, Jackson Clinic, Madison, Wis.:

Diseases of the Gallbladder Ducts and Liver: Exhibit of models and charts illustrating diseases of the gallbladder and liver and the various steps in cholecystectomy; slides amplifying these conditions and illustrating the pathologic changes; technic of T-tube drainage of the common duct; charts and drawings demonstrating surgical methods used in treating disease of the biliary system; a study of anatomic variations of the cystic artery and a series of cholecystograms.

J. W. THOMPSON, St. Louis:

Experimental and Clinical Study of a New Suture Material: Exhibit of transparencies and drawings of microphotography of healing wounds, comparing the properties of a new suture material of a bovine membrane with catgut, silk and linen; drawings illustrating the technic of performing operations for hernia; photographs and transparencies showing end results in patients with hernia who have been operated on.

N. FREDERICK HICKEN and R. RUSSELL BEST, Omaha Clinic, Omaha:

Discharges from the Nipple: Their Clinical Significance and Diagnosis: Exhibit showing that spontaneous discharges from the nipple, other than during lactation, signify abnormal physiologic and pathologic changes; carcinoma, sarcoma, papilloma, degenerating benign tumors, mazoplasia, trauma, infection and cystic degeneration of the breast may or may not produce a discharge from the nipple; the escaping secretions may consist of blood serum, pus, altered milk and products of degenerating tumor or desquamating epithelial cells from the ducts, depending on the nature of the provocative factor; symptoms and physical changes are correlated by transilluminations, manimographies, roentgenologic and microscopic studies; classification and results of studies are presented by colored transilluminations, drawings and moulages.

D. HENRY POER, Atlanta, Ga.:

Survey of Thyroid Diseases in Georgia: Exhibit of charts, graphs and transilluminated photographs to show types and relative incidence of goiter; studies of hypothyroidism and cretinism; experimental studies in thyroparathyroidectomized animals; results in treatment of tetany with ditachysterol; blood iodine studies; statistical and pictorial study of thyroid diseases in a nonendemic area of the United States for comparative purposes.

ROLAND M. KLEMME, St. Louis:

Accurate Differential Section for Treatment of Trigeminal Neuralgia; Athetosis and Its Treatment: Exhibit of moulages and models of heads showing steps of operation and treatment of trigeminal neuralgia; charts of patients before and after operation.

JOSEPH FELSEN and BENJAMIN LEWIS, New York:

Acute Segmental Appendicitis: Experimental and Clinical Studies: Exhibit of gross photographs, photomicrographs, drawings and mounted specimens of rabbit and human appendices showing acute segmental appendicitis as a pathologic and clinical study in the human being supplemented by the reproduction of characteristic lesions in rabbits by means of vascular occlusion, which may be the result of mechanical factors or the action of toxins or bacteria from a distant focus; the role of the indirect hematogenous excretory mechanism is stressed in intestinal infection; whether mechanical or excretory in origin, thrombosis of the appendical vessel is followed by a sharply segmental area of mucosal necrosis which corresponds

to the distribution of the involved vessel; intramural bacterial invasion from the appendical lumen occurs with a tendency to fan-shaped spread toward the serosa.

HAROLD LINCOLN THOMPSON, Los Angeles:

Surgical Treatment of Peptic Ulcer: Exhibit of drawings illustrating the problems encountered in the surgical treatment of gastric and duodenal ulcer.

MANUEL GRODINSKY and EDWARD HOLYOKE, Omaha:

The Anatomic Basis of Deep Abscesses of the Head, Neck and Adjacent Regions: Exhibit of transparencies, made from (1) diagrammatic drawings based on dissections, injections and sections of human material, and (2) tracings on bleached photographs of sections of adult and fetal material; moulages made from transverse sections of adult material; posters explaining the transparencies and moulages, and indicating the clinical implications with special reference to Ludwig's angina, retropharyngeal abscess and other deep abscesses.

MOTION PICTURES

Motion pictures on surgery will be shown continuously in an area adjoining the exhibits by the following:

CONRAD J. BAUMGARTNER, Los Angeles:

JOSEPH F. JAROS, Chicago:

JEROME M. LYNCH, New York:

Section on Obstetrics and Gynecology

The representative to the Scientific Exhibit from the Section on Obstetrics and Gynecology is H. Close Hesselstine, Chicago.

A. LOUIS DIPPEL and WEBSTER H. BROWN, Johns Hopkins Hospital, Baltimore:

Roentgen Visualization of the Placenta in Placenta Praevia and Other Conditions: Exhibit of films showing that by means of soft tissue roentgen technic the placenta as well as the uterine wall may be readily visualized in pregnant women; in cases of suspected placenta praevia this method obviates the necessity of vaginal examination; exhibit based on sixty cases of suspected placenta praevia in which the placenta was localized by this method and placenta praevia either diagnosed or ruled out.

CON FENNING, University of Utah, Salt Lake City:

Indirect External Hysterography; Equipment and Recordings: Exhibit of equipment showing the compact, portable, completely self-contained unit and its individual components; four sets of representative recordings of uterine activity secured from the human being during various periods of pregnancy.

CHARLES EDWIN GALLOWAY and TOM D. PAUL, Evanston, Ill.:

Colored Photography of the Pathologic Cervix: Exhibit of photographs of various pathologic lesions shown as lantern slides in a view box and as colored pictures hung on the wall; projector showing lesions on a screen; camera for clinical photographic work.

WYMAN C. C. COLE and DAVID C. KIMBALL, Detroit:

Etiologic Factors in Neonatal Asphyxia: Exhibit of charts, graphs and slide-film projection presenting a statistical and clinical analysis of 5,000 consecutive newborn babies delivered at the Woman's Hospital, Detroit; particular attention to the role of sedatives and anesthetics.

NORRIS W. VAUX, P. BROOKE BLAND, EDWARD A. BURT and DAVID R. MORGAN, Philadelphia:

Intracranial Injuries of the Newborn: Exhibit demonstrating intracranial injuries occurring in the newborn; intracranial hemorrhage, tears of the tentorium and falx cerebri and injuries to the brain substance.

A. W. DIDDLE and WILLIAM F. MENGERT, Iowa City, and D. M. EARL, New York:

The Position of the Uterus in the Living: Exhibit of roentgenographic and photographic studies of living adult females, both normal and with varying degrees of prolapse, made after adequate visualization of the uterus; by reflected light the photograph only is apparent, while by transillumination the uterine position and the skeletal structures are imposed on the photograph of the body form.

WILLIAM H. VOGT, WILLIAM C. STUDE, PAUL FLETCHER and ROY V. BOEDEKER, St. Louis University School of Medicine, St. Louis:

Aspects of Obstetric Practice in St. Louis and in Missouri: Exhibit showing public health aspect and postgraduate instruction to the physician in the practice of obstetrics; analgesia in obstetric practice; cesarean section in a series of selected hospitals in St. Louis.

SAMUEL L. SIEGLER, Brooklyn:

Artificial Ovation in the Human Being with the Hormone of Pregnant Mare's Serum and Its Clinical Application: Exhibit depicting artificial ovulation in the rabbit, monkey and human being with the hormone of pregnant mare's serum and its clinical application, in the human being in amenorrhea and sterility and anovulatory menstruation, functional bleedings and spermatogenesis; colored transparencies showing stages in the production of ovulation in the three forms mentioned; photomicrograph of the artificially produced follicles by the hormone of pregnant mare's serum in various stages; photomicrographs and drawings illustrating the development of the follicle and its migration to the surface; graphs showing the biologic assay and methods of extraction of the hormone of pregnant mare's serum; a graph of actual ovulation during the cycle; photomicrographs of endometrial studies of anovulatory bleedings and the effect of the hormone of pregnant mare's serum; charts showing the clinical application of the hormone of pregnant mare's serum.

DOUGLAS P. MURPHY, Philadelphia:

Characteristics of the Uterine Contractions of Late Pregnancy: Exhibit of a tocograph with tracings taken at intervals of several days throughout the last two months of pregnancy, as secured from five patients; graphs to indicate the progressive increases in the various characteristics of the recorded waves; tracings taken from a collection of records made on 100 other patients to illustrate peculiar characteristics of uterine motility.

MOTION PICTURES

F. B. ZENER, NORMAN A. DAVID and H. F. VEIERS, University of Oregon Medical School, Portland:

Vioform N. N. R. in the Combined Treatment of Vaginal and Intestinal Trichomonas.

WILLIAM H. VOGT, St. Louis University School of Medicine, St. Louis:

Obstetric Practice.

Section on Ophthalmology

The section exhibit committee of the Section on Ophthalmology consists of Georgiana Dvorak-Theobald, Oak Park, Ill., chairman; Theodore E. Sanders, St. Louis, and Derrick T. Vail Jr., Cincinnati.

JOHN J. PRENDERGAST, St. Paul:

Ocular Leprosy: Exhibit of photographs of gross and microscopic lesions and sections, and microscopic sections.

L. T. POST, Washington University School of Medicine, St. Louis:

Studies on Inclusion Blepharitis: Exhibit demonstrating the incidence, pathologic changes and diagnosis of inclusion blepharitis; specimens showing the anatomy of the levator muscle in relation to ptosis and the use of fluorescence in lens surgery.

LEO L. MAYER, Chicago:

Optic Pathways in the Brain: Exhibit of an enlarged pictured section of one half of the cerebrum, the cuts united by strings showing the optic pathways and legend of the surrounding important structures; drawings of the brain from lateral, ventral, dorsal views showing the pathways (schematic).

THEODORE J. DIMITRY, New Orleans:

Evolution of a Sucking Disk for Extraction of Cataractous Lens in Capsule: Exhibit of drawings of and the different instruments used in the past and at the present time to remove the lens by a vacuum gripping; original instruments and one not larger than a fountain pen, showing that the disk placed in contact with the lens is quite flat.

JAMES H. ALLEN, University Hospital, Iowa City:

Staphylococcal Conjunctivitis: Exhibit showing clinical stages of staphylococcal conjunctivitis both by colored drawings and

by models of the external eye; colored drawings illustrating the experimental reproduction of the disease by means of toxin and by means of staphylococcus inoculations in rabbits and in human volunteers; rabbits in which the disease has been reproduced by both methods demonstrated.

FREDERICK A. DAVIS, University of Wisconsin Medical School, Madison:

Primary Tumors of the Optic Nerve, or Phenomenon of Von Recklinghausen's Disease: Exhibit of photographs and photomicrographs with descriptions, showing primary tumors of the optic nerve associated with this syndrome.

LOUIS BOTHMAN and R. W. BENNETT, University of Chicago, Chicago:

Photography of the Eye: Exhibit of stereoscopic photographs of unusual and rare diseases of the fundus and stereophotographs of diseases of the anterior segment.

W. H. LUEDDE, C. T. EBER, L. C. DREWS, J. T. ELZ and F. W. LUEDDE, St. Louis:

Ophthalmic Physiology and Pathology: Exhibit of photomicrographs and charts illustrating the mechanism of accommodation; photomicrographs in color illustrating interesting conditions in ophthalmic pathologic conditions, with special review of interesting specimens in Wintersteiner collection; demonstration and measurement of simultaneous color contrast; clinical studies of retinal tears and retinitis pigmentosa.

Section on Laryngology, Otology and Rhinology

The representative to the Scientific Exhibit from the Section on Laryngology, Otology and Rhinology is Lee Wallace Dean Jr., St. Louis.

HARRY N. GLICK, St. Louis:

Anatomy and Surgery of Temporal Bone: Exhibit of charts and photographs and dry and wet specimens to show anatomy of fetal, infant and adult temporal bone; dry and wet anatomic material showing various operative procedures on the temporal bone.

THEODORE E. WALSH and PAUL R. CANNON, University of Chicago, Chicago:

Some Effects of Commonly Used Nasal Medications on the Lungs: Exhibit of transparencies of photomicrographs of lungs of animals treated intranasally with various commonly used nasal medications, together with some photomicrographs of human material; specimens of lungs of animals similarly treated, cleared by the Spalteholz method; medications considered under the headings of oils, antiseptics and astringents; the increasing incidence of lipid pneumonia in human beings, in adults as well as in children, showing the ease with which nasal medicaments may reach the lungs and the importance of knowing what effects such medicaments may have on normal lungs.

C. C. BUNCH, Washington University School of Medicine, St. Louis:

Deafness from Acoustic Trauma: Exhibit presenting an audiometric study of patients who have been deafened or made hard of hearing because of excessive stimulation by loud noises; cases of deafness in metal workers, hunters and soldiers, telephone operators, tractor drivers and the like, comparisons being made between deafness of this type and that from other common types of nerve involvement or other involvement of the inner ear.

MILLARD F. ARBUCKLE and A. C. STUTSMAN, St. Louis:

Bronchoscopy as an Aid in the Diagnosis and Treatment of Disorders of the Chest: Exhibit demonstrating the diagnosis of nonopaque foreign body in tracheobronchial tree; endobronchial neoplasms; diagnosis and treatment of lung abscess; lung mapping for localization and extent of bronchiectasis and other disorders.

MAX CUTLER, Chicago Tumor Institute, Chicago:

Cancer of the Larynx: Exhibit of charts, models and photographs, gross specimens, photomicrographs and roentgenograms of the soft tissue demonstrating (a) anatomy of the larynx, (b) clinical types and anatomic locations of laryngeal carcinomas, (c) clinical examination and methods of diagnosis of laryngeal carcinomas, (d) histopathology, (e) treatment and (f) results.

EDWARD C. ARMBRECHT, Wheeling, W. Va.:

Oral Surgery: Exhibit of photographs taken before and after operation of oral surgical conditions found in patients, such as

fractures of the jaw, oral tumors, cleft lip and cleft palate and miscellaneous conditions comprising impacted teeth, unusual deformities of the teeth, oral manifestations of certain systemic diseases, foreign bodies found in the mouth and so on; charts analyzing series of cases on fractures of the jaw, blood observations and anesthesia in oral cases.

JAMES B. COSTEN, St. Louis:

The Mandibular Joint Syndrome; A Symptom Complex of Pain and Ear Symptoms Produced by Disturbed Function of the Temporomandibular Joint: Exhibit of photostat enlargements of descriptive legends detailing the symptoms; anatomic drawings illustrating the structural basis of the disease; enlarged copies of roentgenograms of typical mandibular joint destruction; selected number of roentgenograms showing no destruction but showing uneven position of the condyles within the fossa; examples of trismus.

J. R. LINDSAY, University of Chicago, Chicago:

Suppuration in the Petrous Pyramid; Pneumatization of the Pyramid; Histopathology of Suppuration; X-Ray Demonstration: Exhibit showing that the development of pneumatized areas around the labyrinth and in the apex of the temporal bone follows certain definite patterns, and that exact knowledge of these patterns of pneumatization is essential for accurate diagnosis in acute and chronic suppuration and for a systematic and efficient method of surgical approach; each type or pattern of pneumatization demonstrated by selected temporal bone sections, photographs of gross specimens and diagrams for orientation; roentgenograms illustrating both normal pneumatization and the appearance when suppuration is present in each of these areas, both acute and chronic; serial sections from fatal cases of petrositis which illustrate the pathologic changes of suppuration in each of the pneumatized areas demonstrated anatomically.

DOROTHY WOLFF, VICTOR GOODHILL, ROBERT OWSLEY, J. W. WOODROW, S. LAURENCE KEMPLER and LEONARD G. ROSENTHAL, Washington University, St. Louis:

Anatomy and Pathology of Middle and Inner Ear: Exhibit of colored lantern slides showing anatomy and pathologic changes of temporal bone; microprojection of microscopic slides of temporal bone; phylogenetic explanation of juxtaposition of cochlea and organ of equilibrium; graduate student preparation of dissections of membranous labyrinth in fish and human beings; human fetal and term bony labyrinth dissections; human woods metal casts; bony labyrinth dissections of birds.

T. E. CARMODY, Denver:

Pathologic Conditions of the Mouth and Face: Exhibit of pathologic conditions of the mouth and face and the operative procedure for treatment; cleft lips and palate, carcinoma, tumors of lips, tongue and gums, osteomyelitis of the jaw, plastic surgery of the nose and face and the like, illustrated with still and motion pictures, many in color.

LOUIS J. BIRSNER, Washington University School of Medicine, St. Louis:

Anatomic Exhibit: Exhibit of specimens.

MOTION PICTURE

T. E. CARMODY, Denver:

Pathologic Conditions of the Mouth and Face.

Section on Pediatrics

The representative to the Scientific Exhibit from the Section on Pediatrics is Arthur F. Abt, Chicago.

ISAAC SCHOUR and H. G. PONCHER, University of Illinois College of Medicine, Chicago:

Calcium Metabolism and Teeth: Exhibit of charts, transparencies and reconstruction models which demonstrate on the basis of experimental and clinical data that growing and adult teeth differ in their response to calcium metabolism: (1) during their period of growth and calcification the enamel and dentin reflect accurately changes in calcium metabolism but are not subject to calcium withdrawal and, when fully developed, present a permanent record which cannot be altered by calcium therapy; (2) the calcification pattern of the enamel and dentin constitutes a kymographic reflection of the developmental pattern of the growing individual (prenatal, infancy and childhood periods, demarcated by the neonatal, infancy and childhood rings); (3)

the periodontal tissues grow continuously and therefore give a transitory record of the present in the adult as well as the young individual.

THEODORE O. ELTERICH, Pittsburgh:

Problems in Childhood Endocrinology, Mental Deficiency and Associated Constitutional Anomalies: Exhibit of illustrated case histories of interesting children encountered and followed over a period of years, demonstrating respectively disturbances of the pituitary, thyroid and adrenal glands and the pancreas and gonads; observations on cases of pseudohermaphroditism, hermaphroditism, hypertelorism and several unusual types of constitutional anomalies; data indicating at least partial relationship of endocrine factors to such clinical conditions as pseudo-hypertrophic muscular dystrophy, asthma and chondrodystrophy.

ALEXIS F. HARTMANN, HENRY L. BARNETT, ANNE M. PERLEY and MARY B. RUHOFF, St. Louis:

The Use of Sulfapyridine in Infants and Children: Exhibit describing the drug and its chemical constitution, absorption-excretion data, toxicity and effect on bacterial infections; clinical charts on cases of pneumonia, peritonitis, meningitis and other infections, including *Streptococcus viridans* endocarditis; toxicity and changes in acid-base balance (similar to sulfanilamide), methemoglobinemia and cyanosis and control with methylene blue (similar to sulfanilamide).

MAURICE L. BLATT and ELLIS H. HARRIS, Chicago:

A Diet for the Premature Infant: Exhibit showing collection of breast milk, preparation of formulas in the diet kitchen, equipment and methods of feeding premature infants, the stool of the premature infant, growth of premature infants on specific diets; mortality rates arranged according to birth weight.

PRISCILLA WHITE and RICHARD WAGNER, Boston:

Diabetes in Youth: Exhibit showing the etiology, incidence, distinctive features of onset, constitutional factors, complications, treatment, hypoglycemia and prognosis of diabetes in youth; infants of diabetic mothers.

WILLIAM W. ANDERSON, Atlanta, Ga.:

Congenital Lung Cysts: Exhibit dealing with the occurrence, the incidence in the very young, the rapid expansion in inter-current infection, as pneumonia, the air-trap and air-expansile type and the theories as to the formation of congenital lung cysts.

H. D. PALMER, Rockford Hospital, Rockford, Ill.:

Congenital Heart Disease: Exhibit showing the various forms of congenital heart disease illustrated by oil painted models cast from actual specimens; photographs, photomicrographs, roentgen films (on lantern slides shown in small illuminated boxes), drawings and specimens arranged to show the details of the various manifestations exhibited.

Section on Pharmacology and Therapeutics

The representative to the Scientific Exhibit from the Section on Pharmacology and Therapeutics is Wallace M. Yater, Washington, D. C. In addition to other exhibits, the section is contributing to the Exhibit Symposium on Heart Disease and to the group of exhibits on pneumonia.

SINCLAIR LUTON, St. Louis:

Major Error Involved When Droppers, Including the U. S. P. XI, Are Used in Measuring Fluid Digitalis Preparations: Exhibit illustrations, photographs and the like of historical material; graphs (1809-1900) showing differences in drop commonly printed in standard textbooks; graph showing opinion of forty clinicians as to the size of digitalis drop, with dosage error; table showing results obtained when fourteen commonly used droppers are used with ten "tinctures" of digitalis and with water and apertures measured; graph based on this table demonstrating the exact figures with a given combination, together with the dosage error; dosage error circle graph; statement as to dosage error to be avoided by dry digitalis; proper measuring (no droppers); charts showing results of U. S. P. XI dropper with water and tincture of digitalis; bottles with tincture in suitable vehicles.

FREDERICK STEIGMANN, Chicago:

Therapy of Icterus: Exhibit of drawings and microscopic slides showing the sites of origin of the different types of jaundice, their pathogenesis, etiology and variations in bile pigment

metabolism; posters showing etiologic and diagnostic factors in jaundice; a detailed therapy of icterus shown by means of posters; the "rest-and-work therapy" methods for liver disease complicated by jaundice, with the emphasis placed on the causal treatment.

THOMAS FITZ-HUGH JR., Philadelphia, and ADOLPH J. CRESKOFF and HARRISON F. FLIPPIN, Hospital of University of Pennsylvania:

Idiosyncratic Effects of Certain Drugs on the Blood and Blood-Forming Tissues: Exhibit of charts, photomicrographs, slides and transparencies presenting the newer knowledge of allergic-like reactions of the blood and of blood-forming tissues to certain drugs; the clinical syndromes of hematologic importance which result from such causes, together with lists of drugs and proprietaries that have been suspected or proved as causes; certain possible conditioning mechanisms illustrated in support of the theory of "conditioned toxicity"; a file of reprints, case histories and journal articles.

GEORGE W. THORN, R. PALMER HOWARD, KENDALL EMERSON JR., and WARFIELD M. FIRON, Johns Hopkins University and Hospital, Baltimore:

Studies on Desoxycorticosterone (A Synthetic Adrenal Cortical Substance): Exhibit of charts, photographs and roentgenograms of patients who have been treated successfully both by injections of the synthetic hormone in oil and by subcutaneous implants of pellets of crystalline material; demonstration of the apparatus used for making pellets and a demonstration of the pellets used in implantation.

HUGH R. BUTT and JESSE L. BOLLMAN, Mayo Clinic, Rochester, Minn.:

Vitamin K in the Control of Hemorrhage in Jaundice: Exhibit of charts and figures showing the sources of vitamin K, its effect on the experimental animal and its effect on the human, with the hemorrhagic diathesis of jaundice; comparison of the quantitative and qualitative methods of measuring the prothrombin level in the blood of these patients and the effect of vitamin K on the level of prothrombin will be illustrated; effects of the vitamin and bile in the prevention and control of the hemorrhagic diathesis in jaundice is illustrated by charts and typical case histories.

SAMUEL H. SCHWITZ, Youngstown, Ohio, and C. E. SANDERS, Kansas City, Kan.:

Various Modes of Treatment of Peripheral Vascular Diseases: Exhibit showing treatment of patient on vasoseillator bed with intermittent venous compression; "homemade" suction pressure apparatus; intermittent venous compression (Collens-Wilensky), mecholy by iontophoresis, whirlpool bath and paraffin bath; charts of classification of diseases and treatment; photographs of patients before and after treatment; demonstration of a stool for patient's use while resting.

ARTHUR F. ABT and CHESTER J. FARMER, Northwestern University Medical School, Chicago:

Vitamin C; Pharmacology and Therapeutics: Exhibit dealing with the pharmacology of vitamin C; sources of vitamin C; normal requirements of vitamin C; methods of determining the vitamin C in blood, urine and feces; pitfalls of various methods proposed; influence of dietary intake on the blood level and the excretion in urine and feces; requirements for pregnant and lactating women and for the breast-fed and artificially fed infant; renal excretion of vitamin C; effects of artificial fever on vitamin C blood levels; intravenous administration and excretion in urine and feces; subjects dealing with the therapeutics of vitamin C; avitaminosis due to malabsorption, achlorhydria and destruction in the intestinal tract; vitamin C requirements in infectious diseases as in scarlet fever, diphtheria and rheumatic fever; therapeutic need in gastric ulcer; sensitivity to arsphenamine and in wound healing; relationship to conditions of the teeth and cataract; demonstration of scurvy.

Section on Pathology and Physiology

In addition to a large group of exhibits on pathology and physiology, the section is contributing to the Exhibit Symposium on Heart Disease. The representative to the Scientific Exhibit from the section is Frank W. Konzelmann, Philadelphia.

F. P. McNAMARA, Finley Hospital, Dubuque, Iowa:

Significance of Necropsy Studies in a 100 Bed Hospital: Exhibit based on an analysis of 550 necropsies in a 100 bed hospital consisting of tables and charts which show the principal lesions encountered, the primary and contributory causes of death, the gradual increase in the number and percentage of necropsies and the improvement in antemortem diagnosis; copies of the necropsy records and of reprints based on clinical and necropsy studies showing the value of necropsies in stimulating the utilization of material available in every hospital for continuous postgraduate education.

C. ALEXANDER HELLWIG, St. Francis Hospital, Wichita, Kan.:

The Diffuse Colloid Goiter (Structure, Function and Experimental Production): Exhibit of transparencies, photographs and photomicrographs illustrating structure and function of the colloid goiter; specimens of surgical goiter illustrating that diffuse colloid goiter is the most important type of goiter in North America; experimental colloid goiter in white rats, produced by calcium-rich diet and relatively high iodine content.

B. S. KLINE, A. M. YOUNG and R. STRAUS, Mount Sinai Hospital, Cleveland:

Healing with Pseudodiverticulum Formation Following Perforation in Acute Appendicitis: Exhibit of specimens, photographs and photomicrographs showing acute inflammation of the walls, perforation, progressive healing and pseudodiverticulum formation.

EDWARD R. JANJIGIAN, Danville State Hospital, Danville, Pa.:

The Basometer, A New Method of Estimating the Basal Metabolic Rate: Exhibit of drawing of the basometer with a small model of the basometer and a sliding rule; charts and tables, showing the factors influencing the basal metabolic rate, their distribution and the like; tables evaluating the reliability of the basal tests; tables showing fundamental metabolic steps in metabolism of carbohydrates, proteins and fats, and their bearing on basal metabolism; technique of determining the basal rate on the basometer and comparison of results with those of the basal machines; summary of certain points to bear in mind in diagnosis and surgery of the thyroid.

KERMIT CHRISTENSEN, St. Louis University School of Medicine, St. Louis:

Innervation Studies; Autonomic Innervation of the Orbit and of the Teeth: Exhibit of charts and photomicrographs showing the innervation of the orbit and the teeth.

ALBICK B. HERTZMAN, St. Louis University School of Medicine, St. Louis:

Photo-Electric Plethysmography; Clinical Applications to the Peripheral Circulation: Exhibit of photo-electric plethysmographs for the digits (fingers and toes), the nasal septum and the skin; plethysmograms from normal and abnormal conditions; use of the skin plethysmograph for estimating the cutaneous blood supply.

CHARLES GESCHICKTER, Johns Hopkins Hospital, Baltimore:

Forms of Mammary Cancer and Their Experimental Production in the Rat: Exhibit of photographs, charts, gross specimens and whole mounts of mammary glands illustrating clinical and experimental pathologic changes of mammary cancer; adenocarcinoma, duct carcinoma and scirrhous cancer (infiltrating form) with metastases to the lung has been produced in the male and female rats of the standard Wistar strain the normally free from breast tumors; the exhibit shows the pathologic condition of the experimental tumor and the method of production and the corresponding human forms of mammary cancer and their known etiologic factors.

WILLIAM C. LANGSTON, WILLIAM J. DARBY and PAUL L. DAY, University of Arkansas, Little Rock:

Nutritional Cytopenia (Vitamin M Deficiency) in the Monkey: Exhibit of charts and photographs illustrating the anemia and leukopenia in monkeys resulting from vitamin M deficiency; evidence presented that this cytopenia is not the result of a deficiency of vitamin A, vitamin D, thiamin, riboflavin, ascorbic acid, nicotinic acid or inorganic elements; certain liver extracts and yeast were effective in preventing and curing the cytopenia; yellow bone marrow preparation and nucleic acid were ineffective; stained blood specimens for microscopic examination.

J. WILLIAM WHITE, Scranton, Pa.:

Carcinoma of the Uterine Cervix: Exhibit of placards showing etiology, incidence, pathologic changes, symptoms, signs, classification, regional metastatic spread, statistics, diagnosis and treatment; photomicrographs and microscopic slides showing various types of cervical cancer; drawings of early cancer of the cervix; models of stages of the disease and models, records and diagrams of radium applications.

HERBERT T. KELLY, EDMUND L. HOUSEL and WILLIAM M. EMREY, Philadelphia:

Deficiency Disease: Exhibit of charts and illustrations indicating the importance of the minor quantities of the diet, which are of major importance in the maintenance of the state of good health; a simplified syndrome of these conditions together with their effect; chart indicating the quantitative composition (vitamins, calories and minerals) of the various items of the American diet by which a quantitative assay of an average twenty-four hour intake for the individual patient may quickly and easily be determined; emphasis placed on the factors of supply, demand, absorption and utilization so that a rational therapy may be determined.

JOSEPH ERLANGER and A. S. GILSON JR., Washington University Medical School, St. Louis:

The Mechanism of the Production of the Sounds Emitted by an Artery During Pressure Determinations: Exhibit of records showing the movements of the freed wall of an artery in situ at the point at which and while it is being decompressed as in making blood pressure determinations, and also of apparatus with which such records can be obtained; development of the relevant phenomena (the preanacrotic or breaker phenomenon and the sounds) in a simple model.

TEMPLE FAY and LAWRENCE W. SMITH, Temple University School of Medicine, Philadelphia:

Temperature Factors in Cancer and Embryonal Cell Growth: Exhibit demonstrating a bedside unit used in the refrigeration therapy of cancer along with the various instruments devised for treatment of different parts of the body; a series of cleared chick embryos incubated at progressively reduced temperatures showing the fundamental biologic character of the temperature factor in cell growth; transparencies of chick embryos and progressive biopsy specimens from cancer patients under treatment.

ALBERT KUNTZ, P. A. CONRATH and W. F. ALEXANDER, St. Louis University School of Medicine, St. Louis:

The Autonomic Nervous System: Exhibit of charts illustrating the anatomic relationships of the sympathetic and parasympathetic divisions of the autonomic nervous system and the innervation of visceral organs, accompanied with anatomic preparations.

BENJAMIN T. TERRY, Tacoma General Hospital, Tacoma, Wash.:

Rapid Section Technique: Exhibit showing how to cut, stain and have ready for microscopic examination in sixty seconds sections of fresh unfixed tissue; how to cut, stain and have ready for immediate microscopic examination sections of fixed malignant tissues; the technique for sectioning and staining difficult tissues: directions and diagrams given away for making an inexpensive, efficient cutter, cutting board and stain.

Section on Nervous and Mental Diseases

The representative to the Scientific Exhibit from the Section on Nervous and Mental Diseases is Roland P. Mackay, Chicago. Motion pictures will be shown in an adjoining area in addition to the exhibits.

CHARLES P. LARSON, Western State Hospital, Fort Steilacoom, Wash.:

Occurrence of Brain Tumors in Mental Hospital Patients: Exhibit of watch-glass mountings of different types of brain tumors which were found during the course of routine autopsies performed on patients dying at the Western Washington State Mental Hospital; statistical survey of the number and types of brain tumors encountered in a three-year period showing that in 13.5 per cent of all the autopsies performed during this period some type of intracranial tumor was found; charts demonstrating the correlation between the mental status of the patient and the situation of the tumor.

G. WILSE ROBINSON and G. WILSE ROBINSON JR., Neurological Hospital, Kansas City, Mo.:

Delirium: Exhibit showing the causes, pathologic changes and treatment, pointing out that delirious manifestations always arise from the same pathologic condition and that when delirium does arise it indicates a serious physical condition, somewhat similar to shock, although its effects are localized, and that the pathologic condition behind the delirium must be treated as well as the primary condition which, through a series of cycles, has produced delirium.

WALTER L. BRUETSCH and MAX A. BARR, Central State Hospital and Indiana University School of Medicine, Indianapolis:

Psychoses with Chronic Rheumatic Brain Disease: Exhibit of charts showing the frequency of rheumatic changes of the brain found at autopsy of institutionalized mental patients; photographs illustrating the nature of the gross and microscopic lesions in the brain and heart of these patients.

RALPH M. STUCK, Denver:

Surgical Epilepsy: Exhibit of artists' drawings and displays telling the important facts to be gathered in the history, showing normal anatomic physiology and most of the pathologic lesions in epilepsy amenable to surgery.

ABRAHAM MYERSON and LEO ALEXANDER, Boston State Hospital, Mattapan, Mass.:

Mineral Studies of the Brain by Means of Microincineration and Spectroscopy: Exhibit of apparatus used; photomicrographs of normal and pathologic brain tissue; reproductions of spectroscopic graphs.

J. F. FULTON and MARGARET A. KENNARD, Yale University, New Haven, and CARLYLE F. JACOBSEN, Washington University, St. Louis:

Functions of the Frontal Lobe with Particular Reference to the Motor and Premotor Areas (Areas 4 and 6 of Brodmann): Exhibit of a series of diagrams, brain models and motion picture showing functions of the frontal lobe with particular reference to the motor and premotor areas.

MOTION PICTURES

Motion pictures will be shown continuously throughout the week, among which will be the following:

J. RUDOLPH JAEGER, Denver:

Lumbar Sympathectomy for Traumatic Sciatic Neuritis.

Repair of Bone Defect in Skull.

Spinal Cord and Concha Equina Injury.

Frontal Lobe Tumor.

Diagnosis of Brain Lesions by Injection of Air.

Herniated Intervertebral Disk (with Sciatic Neuralgia).

Tic Douloureux (Diagnosis and Treatment by Alcohol Injection and Operation).

HENRY R. VIETS and ROBERT SCHWAB, Boston:

Myasthenia Gravis; a Historical, Clinical and Therapeutic Survey.

J. F. FULTON and MARGARET A. KENNARD, Yale University, New Haven, and CARLYLE F. JACOBSEN, Washington University, St. Louis:

Functions of the Frontal Lobe with Particular Reference to the Motor and Premotor Areas (Areas 4 and 6 of Brodmann).

A. E. BENNETT, Omaha, Neb.:

Convulsive Shock Therapy in Affective Psychoses.

Section on Dermatology and Syphilology

The representative to the Scientific Exhibit from the Section on Dermatology and Syphilology is Hamilton Montgomery, Rochester, Minn. In addition to the exhibits, motion pictures will be shown in an adjoining area.

ELMORE B. TAUBER and H. G. REINEKE, University of Cincinnati College of Medicine, Cincinnati:

Atypical Forms of Bone Syphilis: Exhibit of charts, photographs and roentgenograms, showing an unusual series of bone syphilis; the typical bone syphilis of prenatal and acquired syphilis compared with selected cases of bone syphilis of very unusual types; cases will show that the complete examination and follow-up studies, in addition to the roentgenograms, will frequently make the diagnosis of unusual forms of bone syphilis.

ERWIN P. ZEISLER, Chicago:

Discoes of the Tongue, Lips and Oral Mucosa: Exhibit of photographs, colored drawings and photomicrographs illustrating the differential diagnosis of syphilitic and nonsyphilitic disease and of cancerous and precancerous lesions of the mouth; a pictorial review of oral disorders with particular reference to those seen in dermatologic practice.

JOSEPH B. HOMAN, Department of Medical Art, University of Cincinnati College of Medicine, Cincinnati:

Value and Limitations of Infra-Red Photographs in Dermatology: Exhibit of charts describing the exact technique of infra-red photography; various types of large photographs illustrate the practical value and limitations of such photography.

MORRIS MOORE, Barnard Free Skin and Cancer Hospital, St. Louis:

Mycotic Infections of Man: Exhibit of clinical photographs of the various mycoses, superficial and deep, in the epidermis, dermis and internal viscera; photomicrographs showing the organism in situ and the histopathologic changes; illustrations and drawings of various fungi; cultures of the fungi in Petri dishes; experimental work on mycoses showing inoculation of the chorio-allantoic membrane of the chick with pathogenic fungi, photomicrographs and the like; experimental work on pityriasis versicolor and seborrheic dermatitis.

GEORGE SCHWARTZ, Boston:

Color Photography in Skin Diseases: Exhibit of lantern slides taken in color with Kodachrome film, showing various cutaneous diseases and syphilis; exact reproduction of the natural color that is characteristic of the particular cutaneous disease shown and the almost lifelike reproduction of the minute details of the lesions, such as macule, papule, vesicle or bulla; pictures of all the common cutaneous diseases and many of the rare ones; some slides show the entire distribution of the lesions on the face and body, while others are close-ups of the individual lesion.

BEDFORD SHELWIRE and H. L. GRAHAM, Dallas, Texas:

Survey of Common Weeds Causing Contact Eczema; Patch-Testing with Their Oils: Exhibit of mounted specimens and photographs in natural habitat of some sixty common weeds considered in survey; charts showing sensitization index of various weeds and occupations of persons affected; demonstration of plant oils, their method of extraction and mode of application to the skin for patch-testing; maps showing national distribution of weeds employed in survey; charts exhibiting reactions in noneczematous controls.

J. K. HOWLES and WILLIAM BRANKS STEWART, Louisiana State University, New Orleans:

Cutaneous Manifestations of Syphilis: Exhibit of paintings from life and plaster molds painted from life on the various cutaneous manifestations of syphilis, including primary, secondary and tertiary lesions.

MOTION PICTURES

Motion pictures will be shown on a regular schedule, among which will be the following:

JOHN G. DOWNING, Boston:

A Clinical and Laboratory Study of Fungous Diseases Demonstrated by a Colored Motion Picture.

MYLES STANDISH, Hartford, Conn.:
Psoriasis.

SAMUEL AYRES, Los Angeles:
Acne Rosacea.

FRED WISE, New York:
Common Lesions of the Eyelids.

C. FERD LEHMANN, San Antonio, Texas:
Leprosy.

LOUIS A. BRUNSTING and HAMILTON MONTGOMERY, Rochester, Minn.:

Skin Lesions of the Legs.

Section on Preventive and Industrial Medicine and Public Health

The representative to the Scientific Exhibit from the Section on Preventive and Industrial Medicine and Public Health is Paul A. Davis, Akron, Ohio.

CARL F. JORDAN, Iowa State Department of Health, Des Moines:

Rocky Mountain Spotted Fever: Exhibit of mounted specimens of some of the animal hosts (chipmunk, ground squirrel, rabbit and dog) and a diagram indicating the various stages in the life history of the common dog tick *Dermacentor variabilis*; live and preserved specimens of the different stages of the wood tick, natural size and magnified; information relative to the clinical and epidemiologic aspects of Rocky Mountain spotted fever and the reported occurrence of the disease in the northern and southern central states area.

ROBERT A. BLACK, O. C. WENGER, LAWRENCE J. LINCK and MARVIN B. OSTERMAN, Chicago Board of Health, Chicago:

Chicago Syphilis Control Program: Exhibit depicting the activities of the Chicago Syphilis Control Program, which is a cooperative enterprise, conducted by the Chicago Board of Health, with the assistance of the Illinois Department of Public Health, United States Public Health Service and the Works Progress Administration; activities include statistical research, public education, free laboratory service, information, consultation service, follow-up and drug distribution service, mechanical system for automatic reporting on treatment-progress and control of venereal disease; a city-wide case finding program.

PHILIP L. VARNEY, Washington University School of Medicine, St. Louis:

Modern Therapy and Prophylaxis of Tetanus: Exhibit showing that the most advanced present day methods of therapy and prophylaxis of tetanus have greatly increased the chances for survival of tetanus patients and, if properly applied, should eliminate the possibility of the development of idiopathic tetanus; mortality rates in properly and improperly treated patients compared; a step-by-step outline of the proper methods, illustrated by means of apparatus, photographs, charts and graphs, including the procedures and equipment used in the preparation of plain and alum-precipitated toxoid and methods for its administration.

CHARLES WALTER CLARKE, New York:

Quackery and Other Unqualified Practices in Relation to Syphilis and Gonorrhea: Exhibit of collection of patent nostrums on the present market with analyses of their contents; charts and maps showing extent and distribution of unqualified practices; common quack advertising; photographs and literature; information about quack practitioners; also about kind and extent of drugstore counter prescribing.

BERT R. BOONE, United States Public Health Service, Washington, D. C.:

Stethography in School Children: Exhibit of photomurals portraying the methods and the technique in obtaining heart sound tracings from elementary school children; tracings and charts describing several important characteristics and variations of heart sounds found in school children; illuminated glass panels showing, by means of appropriate mechanisms, the continuous production of typical heart sound tracings in an enlarged form.

D. L. HARRIS, Washington University School of Medicine, St. Louis:

Rabies; Epidemiology and Prophylaxis: Exhibit of charts, tables and photomicrographs showing pathologic changes and diagnosis of the disease and pathologic aspect of "treatment paralysis."

J. J. BRONFENBRENNER, DONALD M. HETLER, JACK MEHL, BURNETT and FRANCES LOVE, Washington University School of Medicine, St. Louis:

Experimental Alimentary Allergy and Its Prevention: Exhibit of charts and photographs illustrating the fact that, by keeping guinea pigs on a scorbutogenic diet, it is possible to increase the rate of absorption through the digestive tract to such a point that all the animals are sensitized by feeding of soluble protein; allergic state can be elicited not only by the systemic introduction of antigen but also by the production of an anaphylactic syndrome as a result of test feeding; if sufficient vitamin is supplied to such hypersensitive, scorbutic animals, they no longer respond to oral administration of the antigen, while their sensitivity to systemic introduction of antigen remains unimpaired.

R. V. ELLIS and C. O. ROSENDAHL, University of Minnesota, Minneapolis:

Hay Fever Causes for Minnesota: Exhibit of charts presenting mounted herbarium specimens of the principal plants which produce hay fever-causing pollens in Minnesota; maps showing regional distribution and density of population for the plants mentioned; photomicrographs of pollen from each of the plants; graphs showing season and quantitative pollution of the air for each kind of pollen over a period of several years; charts evaluating the relative importance of the several causes in terms of clinical data.

Section on Urology

The representative to the Scientific Exhibit from the Section on Urology is R. S. FERGUSON, New York.

HERBERT E. LANDES and HAROLD C. VORIS, Loyola University Clinics, Chicago:

Clinical Cystometry, an Aid to the Diagnosis of Neurologic and Urologic Lesions: Exhibit of (1) photograph of cystometer used in original studies; (2) portable cystometer used in later studies; (3) cystometrograms characteristic of various neurologic and urologic lesions; (4) chart showing nerve pathways involved in bladder function.

V. S. COUNSELLER and J. T. PRIESTLEY, Mayo Foundation, Rochester, Minn.:

Surgery of the Genito-Urinary Tract: Exhibit showing methods of subtotal vesical resection, of uretero-enterostomy and total cystectomy for cancer of the bladder outlined by photographs, charts and models; recent technical improvements in removing large stag-horn renal calculi are illustrated among the material collected pertaining to surgery of the kidney; plastic surgery for hypospadias and other genital abnormalities is shown.

W. F. BRAASCH and J. L. CRENSHAW, Mayo Foundation, Rochester, Minn.:

Recent Advances in Urologic Diagnostic Methods: Exhibit of roentgenograms, photographs and descriptive material stressing the importance of diagnosis in cases of hematuria; interesting cases of calculous disease, of infections in the urinary tract and the methods of diagnosing and treating them are outlined; the importance of microscopy and of ordinary laboratory methods in the handling of urologic cases emphasized in a manner interesting to both the general practitioner and the specialist.

H. L. WHITE, PETER HEINBECKER and T. FINDLEY JR., Washington University School of Medicine, St. Louis:

Some Hypophyseal Influences on Renal Function: Exhibit of charts, diagrams, photographs and microscopic slides showing (1) the lesion responsible for the production of experimental diabetes insipidus; (2) the nonessentiality of the anterior lobe for polyuria; (3) acute responses to ingestion of water by hypophysectomized dogs and dogs with diabetes insipidus; (4) creatinine and urea clearances and maximum concentrating power of the urine in hypophysectomized dogs and dogs with diabetes insipidus; (5) urinary responses of normal and hypophysectomized dogs and rats to administration of anterior lobe and thyroid; (6) responses of clinical diabetes insipidus to ingestion of water and salt.

GEORGE H. EWELL, Jackson Clinic, Madison, Wis.:

Urography; Diseases and Injuries of the Genito-Urinary Tract: Exhibit of pyelograms, cystograms and urethrograms showing the value of roentgen examinations combined with urologic examination in the diagnosis and treatment of diseases and injuries of the genito-urinary tract; photographs and transparent drawings demonstrating some types of abnormalities in the genito-urinary tract; demonstration of the more common urologic conditions and many unusual cases.

GRAYSON CARROLL, BRANSFORD LEWIS and LOUIS KAPPEL, St. Louis:

Study of the Effect of Drugs on the Ureter: Exhibit of anatomic charts of the nerve supply of the urinary tract; tracings from intact human ureter showing effect of drugs; demonstration of simple method used to obtain these tracings; intravenous urograms demonstrating the effect of various drugs on the ureter; explanatory pamphlet.

G. J. THOMPSON, E. N. COOK, J. L. ENNETT, Mayo Foundation, Rochester, Minn.:

Transurethral Surgery: Exhibit of anatomic models, photographs, charts and descriptive matter pertaining to diseases of the ureter, bladder, prostate, seminal vesicles and urethra; the selection of cases, preoperative methods of treatment, transurethral operative technic and postoperative nursing care; working models illustrating practical points.

ROGER W. BARNES, Los Angeles:

Surgical Treatment of Vesical Diverticula: Exhibit of models showing the different steps in the technic of a new method for the surgical treatment of large vesical diverticula; also the technic for surgical treatment of small vesical diverticula, done through the cystoscope; drawings illustrating the technic, and cystograms, both preoperative and postoperative.

Section on Orthopedic Surgery

In addition to the exhibits of this section, there will be motion pictures on orthopedic surgery in an adjoining area. The representative to the Scientific Exhibit from the Section on Orthopedic Surgery is Frederick A. JOSTES, St. Louis.

VERNON P. THOMPSON and JOHN S. STEPHENS, Los Angeles:

Compression Reconstruction of Recent Intracapsular Femoral Neck Fracture: Exhibit of drawings, models, skiagrams and specimens showing the influence of shear, compression, rotation and obliquity on the fragments; the effect of the reconstruction; the usual oblique femoral neck fracture allows muscle pull and weight bearing to exert a shearing action; removal of a small wedge from the top of the neck converts a relatively vertical fracture line into a relatively horizontal one; a compression relationship of the fragments is thereby established, secured by internal fixation.

MILDRED TROTTER, Washington University, St. Louis:

Accessory Sacro-Iliac Articulations: Exhibit of pelvis which present the variations; tables showing the incidence according to race, sex and age in a series of 776 skeletons of the Washington University Department of Anatomy; prepared skeletons and wet preparations; microscopic sections.

JAMES GRAHAM, Springfield, Ill.:

Weak Foot; Pathogenesis and Treatment: Exhibit of models, sketches and roentgenograms portraying an anatomic and clinical study of the mechanical factors at play in the pathogenesis of the three common clinical varieties of weak foot (postural type, shortened achilles type and anatomic type); treatment of these varieties of weak foot; mechanical apparatus, with emphasis placed on the simplification of mechanical technic; relationships of abnormal body postures and weak feet to the field of general medicine and a more widely applicable approach to the therapy of these extremely common and troublesome conditions.

PAUL C. COLONNA and FREDERICK VOM SAAL, Crippled Children's Hospital, Oklahoma City:

Study of Amputations in the Lower Extremity: Exhibit of charts, photographs of patients and roentgenograms, models and various types of practical appliances; a critical analysis of about seventy-five unselected amputation stumps of the lower extremity, reviewing the cause, complications and end results; the use of temporary and permanent prosthesis with individual time intervals for weight bearing is described.

J. DEWEY BISGARD, Omaha:

Experimental Scoliosis: Exhibit of transparencies and gross specimens of spines of goats in which scoliosis was produced by arresting growth on one side of the vertebral bodies by destruction of the growth cartilage and also by laying grafts along one side of several contiguous bodies; growth of vertebral bodies was also measured by placing steel shot in the vertebra when the animals were approximately 2 weeks old and recording the growth by means of roentgenograms from that time until termination of major growth eight months later; the feasibility of fusing the spine by fusing vertebral bodies in certain cases is suggested.

PHILIP LEWIN, Chicago:

Backache and Sciatica: Exhibit of charts, transparencies and models demonstrating every phase of the subject from the standpoints of anatomy, etiology, pathologic changes, symptoms, differential diagnosis, treatment and end results.

WILLIS C. CAMPBELL and J. S. SPEED, Memphis, Tenn.:

Treatment of Ununited Fractures of the Neck of the Femur: Exhibit of illustrations of various procedures for ununited fractures of the neck of the femur, such as bone graft operation; reconstruction operations; osteotomies; roentgenograms of cases where these procedures have been used.

L. D. SMITH, Milwaukee:

Supracondylar Fracture of the Femur; Treatment by Acute Flexion: Exhibit of a model of a femur and tibia, showing a supracondylar fracture of the femur; traction of the leg increases the dislincement of the distal fragment; acute flexion of the knee releases the deforming muscle pull, tightens the quadriceps tendon anteriorly against the two bone fragments and aligns them; the position maintains reduction and permits ambulation.

AUGUSTUS THORNDIKE JR. and ROBERT J. JOPLIN, Harvard Medical School, Boston:

Cellulose Compound Bandage; a Waterproof Splinting Material: Exhibit demonstrating the application of this bandage material; transparencies of actual cases on which this splinting material was used.

G. MOSSER TAYLOR, Los Angeles:

Manipulative Therapy: Exhibit of charts, art drawings and demonstrations with a living subject, outlining the indications, contraindications and complications, the critical positions for the maneuvers and the manipulations of all the joints in a regular well organized manner.

C. H. CREGO and H. R. MCCARROLL, St. Louis:

Early Treatment of Congenital Dislocation of the Hip, with Skeletal Traction: Exhibit showing results obtained in the treatment of early congenital dislocation of the hip with skeletal traction; a comparative study of the three types of congenital dislocation of the hip—posterior dislocation, upward subluxation and primary anterior dislocation; "before and after" photographs of individual patients of each group together with roentgenograms of a large series of cases bringing out the salient features of each type; materials used in an inexpensive form of skeletal traction with demonstrations on dolls.

MOTION PICTURES

Motion pictures on orthopedic surgery will be shown on a regular schedule throughout the week, among which will be the following:

FREDERICK A. JOSTES, St. Louis:

Backache, A Manipulative Method of Treatment Without Anesthesia.

H. THEODORE SIMON, New Orleans:

The More Common Fractures of the Upper and Lower Extremities; A Newer Method of Demonstrating Fundamental Principles of Treatment.

VERNON P. THOMPSON and JOHN S. STEPHENS, Los Angeles:

Compression Reconstruction of Recent Intracapsular Femoral Neck Fractures.

G. MOSSER TAYLOR, Los Angeles:

Manipulative Therapy.

EDWARD L. COMPERE, Chicago:

Rehabilitation of Poliomyelitis Victims.

LEO MAYER, New York:

Operative Treatment of Surgery of the Paralyzed Upper Extremity.

Section on Gastro-Enterology and Proctology

The representative to the Scientific Exhibit from the Section on Gastro-Enterology and Proctology is Sara M. Jordan, Boston.

DAVID ADLERSBERG and MICHAEL WEINGARTEN, Beth Israel Hospital, New York:

The Small Intestine in Nutritional Deficiency: Exhibit showing the effects of nutritional deficiency in the small intestine, consisting of (1) a characteristic symptom complex, (2) evidence of impaired fat digestion, (3) roentgen changes in the appearance of the small intestine; these changes are demonstrated in sprue and pellagra, in ulcerative colitis and in a group of cases of subclinical deficiency termed chronic nongranulomatous enteritis.

WILLIAM J. MARTIN JR. and JOSEPH C. BELL, Louisville, Ky.:

Sigmoidoscopic and Roentgenologic Diagnosis of Polypoid Lesions of the Large Bowel: Exhibit of roentgenograms of polypoid lesions of the large bowel, with both single and double contrast technic; charts outlining etiologic theories, sex incidence, age incidence, location incidence of malignant changes and the like, based on information obtained from sigmoidoscopic examinations; these are compared as to incidence, location and so forth, with the frank cases of carcinoma of the lower part of the bowel, demonstrated by sigmoidoscopic examination during the same period of time.

JOSEPH W. LARIMORE, St. Louis:

Diseases of the Intestine and the Colon: Exhibit of lantern slides, classified, arranged and illuminated, showing diseases of the intestine and colon.

W. WAYNE BARCOCK, DANIEL J. PRESTON and FRANCIS L. ZABOROWSKI, Temple University Medical School, Philadelphia:

Technical Improvements in Abdominal Surgery: Exhibit showing (a) technic in the formation of perineal colostomy, or the transfer of an objectionable abdominal colostomy to the perineum; (b) statistics and colored slides from more than 200 resections of the large bowel, illustrating technic and results; (c) internal exteriorization for increased safety of stage operations within the abdomen, especially those for the acute gall-bladder or for appendical abscess; (d) the use of Sump drains for prolonged peritoneal drainage in the prevention and treatment of spreading peritonitis; (e) technic of enterostomy for ileus; (f) the rapid closure of small biliary fistulas; (g) the successful early closure of duodenal and other troublesome fistulas; (h) metallic sutures and ligatures for the more secure closure of clean and contaminated abdominal wounds; (i) muscle-splitting rectus retracting incision for resection of colon.

FRANK H. LAHEY, Lahey Clinic, Boston:

Diseases of the Gastrointestinal Tract: Exhibit covering the subjects of carcinoma of the esophagus, peptic ulcer, carcinoma of the stomach, diseases of the small intestine, ulcerative colitis, carcinoma of the rectum, and polyps of the colon and rectum.

HENRY A. RAFSKY, New York:

Diagnostic Criteria in the Differentiation Between Peptic Ulcer and Gastric Cancer: Exhibit of transparencies showing a series of cases in which the differentiation between peptic ulcer and gastric cancer presented diagnostic and therapeutic problems; routine procedures were not as a rule sufficient to make the distinction, and in most of the cases special methods of examination were necessary; investigations consisted of the secretory response, mucosal studies of the stomach, gastroscopy and various laboratory tests; evaluation of these diagnostic criteria will be discussed and their clinical application illustrated.

HARRY E. BACON and HESSER C. LINDIG, Temple University Medical School, Philadelphia:

Extrarectal Metastatic Growths from Malignant Conditions of the Upper Part of the Abdomen: Exhibits presenting a diversified series of cases in colored photomicrographs, roentgen examinations and moulage specimens to permit palpation and visualization of artificial growths; differential diagnosis shown by illustrations; frequently misinterpreted and misdiagnosed extrarectal metastatic growths from malignant growths of the upper part of the abdomen and the mamma.

WALTMAN WALTERS, Mayo Clinic, Rochester, Minn.:

Operative Technic in Treatment of Stricture of the Common Bile Duct: Exhibit showing different types of operative procedure; indications for the various methods and results of their application.

Section on Radiology

The representative to the Scientific Exhibit from the Section on Radiology is E. E. Downs,* Woodbury, N. J.

W. EDWARD CHAMBERLAIN and BARTON R. YOUNG, Temple University Hospital, Philadelphia:

A Harmless Method of Visualizing Ruptured Intervertebral Disks and Spinal Canal Tumors: Air Myelography. Exhibit of transparencies presenting roentgenograms, descriptive data and titles, and photographs illustrating technic.

* Deceased.

JOHN D CAMP, J. G LOYR and M N WALSH, Mayo Clinic, Rochester, Minn.

Intraspinial Protrusion of the Intervertebral Disks Exhibit illustrating the diagnosis of intraspinal protrusion of intervertebral disks as based on the patient's history and physical, orthopedic, neurologic and roentgenologic examinations, the value of lumbar puncture in the examination of the spinal fluid is indicated and the technic of the reversed Queckenstedt test described, the anatomy of the normal intervertebral disk and ligamentum flavum and the relation of these structures to the nerve roots illustrated by moulages, details of the roentgen examination of the spinal subarachnoid space by means of contrast agents shown by transparencies, roentgenograms and moving models, anatomic variations of the spinal subarachnoid space and the roentgenologic characteristics of protruded intervertebral disks and hypertrophy of the ligamentum flavum depicted by roentgenograms and transparencies, moulages illustrating the technic of the surgical removal of protruded intervertebral disks and the resection of the ligamentum flavum, the hypertrophy of which is an almost constant accompaniment of disk protrusion

EDITH H QUIMBY and JOHN POOL, Memorial Hospital, New York

Protection from Roentgen Rays and Radium Exhibit of charts, diagrams, photographs, tables, and other information regarding protection against different types of radiation, various aspects of protection, considered with respect to the patient, the physician, the technician, and the neighbors, types of injury resulting from undue exposure to radiation, data given according to which the necessary protection may be achieved

PAUL C SCHNOEBELN, HERMAN M MEYER and I C MIDDLEMAN, St Louis

Roentgen Examination in Acute Intestinal Obstruction Exhibit showing the value and use of roentgen examination early in cases suspected of intestinal obstruction, serial films show a progressive accumulation of gas and fluid levels early in complete obstruction of small bowel, the signs of complete small intestinal obstruction discussed and demonstrated, case reports with conditions found at operation, literature reviewed and charts prepared for demonstration, complete obstruction in three cases demonstrated by roentgen examination four hours after onset of symptoms, cases proved by operation

LEROY SANTE, St Louis

Roentgenologic Aids in Abdominal Diagnosis Exhibit emphasizing some roentgenologic aids in diagnosis of certain surgical conditions of the abdomen and presenting evidence of the accuracy and value of certain less accepted roentgenologic signs and methods as seen in intestinal obstruction and paralytic ileus, ruptured hollow viscus from trauma and disease, significance of flank shadow in diagnosis of abdominal exudates and subdiaphragmatic abscess diagnosed by aid of pneumoperitoneum

HOWARD E SNYDER, Winfield, Kan

The Ambulatory Management of Fractures of the Lower Extremity Exhibit of photographs of patients and their roentgenograms before, during and after treatment by an ambulatory method, explanatory printed matter grouped with the photographic material for each patient, fractures of the foot, ankle, leg and thigh included, applied and unapplied models of a new type of walking iron arc shown

JAMES F KEITH and D ARNOLD DOWELL, Creighton Medical School, Omaha

Prevention and Treatment of Gas Gangrene and Other Infections with a Mobile Roentgen-Ray Unit Exhibit consisting of clinical data on patients with gas gangrene treated with the mobile roentgen-ray unit, development of the roentgen ray as a means of prevention of gas gangrene, different clinical groups of gas gangrene infection and the roentgen treatment for each group outlined, status of the roentgen ray in this condition, increasing value of therapy with the roentgen ray unit in acute inflammations

L H GABRIAND and HAROLD ARTHUR HILL, San Francisco

Diagnosis of Bony Union in Fractures of the Femoral Neck Exhibit of transparencies and original roentgenograms showing the classification and end results of treatment in fractures of the femoral neck and emphasizing that, since the classification

is frequently valuable as a guide in selection of treatment and since the duration of certain types of internal fixation frequently depends on a roentgen diagnosis of bony union, exactitude in roentgen technic is important, complete details are presented concerning the type of technic used and the criteria on which a diagnosis of bony union may be made

EDMUND P HALLEY, Decatur and Macon County Hospital, Decatur, Ill, and PERRY J MELNICK, University of Illinois College of Medicine, Chicago

Carcinoma of the Breast, Value of Preoperative Irradiation and a Short Irradiation-Operation Interval Exhibit presenting histopathologic evidence for the value of preoperative irradiation in carcinoma of the breast and for a short time interval between irradiation and surgery, characteristic irradiation changes, previously found in experimental animal tumors, were found in this series of irradiated human breast cancers when amputation was done from three to four weeks after irradiation, from six to eight weeks after irradiation (the usual time interval) these changes were no longer present, but regrowth of the tumor and spread along the lymphatics frequently were found, photomicrographs and clinical data presented from this material

EXHIBIT SYMPOSIUM ON HEART DISEASE

The exhibit symposium on heart disease is presented in cooperation with the American Heart Association under the guidance of a committee, the chairman of which is Thomas M McMillan, Philadelphia

GEORGE P ROBB and ISRAEL STEINBERG, New York

Visualization of the Chambers of the Heart, the Pulmonary Circulation and the Great Blood Vessels in Man Exhibit shows the apparatus and technic of the method, contrast roentgenograms with appropriate controls showing the superior vena cava and tributary veins, the four chambers of the heart and their walls, the pulmonic and aortic valves, the pulmonary circulation and the thoracic aorta with the branches from the arch, illustration of the abnormalities found in the following types of heart disease (1) congenital, (2) rheumatic, (3) syphilitic, (4) hypertensive, (5) arteriosclerotic, (6) cor pulmonale, demonstration of abnormalities of the lung and mediastinum including stenosis, occlusion and displacement of the major division of the pulmonary artery occurring in mediastinal and hilar neoplasm and adenitis, enlargement of the pulmonary artery and decreased vascularity of the lung associated with pulmonary fibrosis

RALPH KINSELLA and R O MUETHER, St Louis

Experimental Reproduction and Cure of Streptococcal Endocarditis Exhibit showing steps and apparatus used in the reproduction such as instruments, drawings of operative field and photographs of injured valves, charts of cure with merthiolate and sulfanilamide, reproduction of endocarditis by feeding streptococci by mouth

JOHN H GIBBON, MARY H GIBBON and CHARLES KRAUL, Philadelphia

Studies on Massive Pulmonary Embolism with Demonstration on an Experimental Therapeutic Method Exhibit of charts and graphs illustrating physiologic effects produced by partial occlusion of the main pulmonary artery and the effects produced by occlusion of the branches of that artery, demonstration of apparatus used for the temporary maintenance of life in an animal with the pulmonary artery completely occluded

S C ROBINSON and MARSHALL BRUCE, Chicago

The Range of Normal Blood Pressure, Statistical and Clinical Study of 15,000 Persons Exhibit showing the distribution of systolic, diastolic, mean and pulse pressures in both sexes and in all age groups, the gross hypertensives are removed and the delimited sample is subjected to the same statistical treatment, conclusions concerning the range of normal blood pressure are drawn, added evidence for these conclusions is presented from a study of 500 persons with five to ten year continuous records, mortality data used as a check on the conclusions, from this evidence a new and more rational range of normal blood pressure is presented, a new view of hypertension is introduced, in addition the exhibit depicts the relation of obesity and body build to blood pressure

EDGAR A. HINES JR., Mayo Clinic, Rochester, Minn.:

The Significance of Vascular Hyperreactivity in Essential Hypertension: Exhibit of charts and demonstration with sound amplification of blood pressure readings showing (1) technic of the cold pressor test for measuring vascular reactivity; (2) the important role played by vascular hyperreactivity in the development of essential hypertension, particularly in regard to hereditary factors.

LOUIS N. KATZ and ANNE L. BOHNING, Michael Reese Hospital, Chicago:

Electrocardiogram in Coronary Disease: Exhibit of serial curves (including chest leads) to show electrocardiographic deviations occurring in coronary occlusion and in coronary sclerosis.

WILLIAM M. KINNEY, Joplin, Mo.:

Pulmonary-Vascular and Cardiac Changes in Silicosis: Exhibit of serial films of patients with silicosis to show cardiac enlargement which takes place as the disease progresses; photographs of hearts removed from silicotic patients at autopsy; photomicrographs of sections of myocardium and lung to show the myocardial changes and pulmonary vascular changes.

WILLIAM B. KOUNTZ, St. Louis:

Coronary Flow: Exhibit of charts showing the coronary flow in the human heart; each type of heart disease represented both from an anatomic and functional standpoint; photomicrographs and photographs of the coronary system as demonstrated by roentgen studies; physiologic and anatomic principles which cause variation in coronary flow shown by motion pictures.

WENDELL G. SCOTT and SHERWOOD MOORE, Washington University School of Medicine, St. Louis:

Advances in Roentgen Diagnosis of Heart Disease: Exhibit demonstrating the anatomic relationships of the heart and great vessels as seen in the frontal, lateral and in the right and left oblique positions; the clinical advantages in using these positions are discussed; the value of roentgen kymograms and of laminagraphs obtained by body section radiography is demonstrated in the roentgen diagnosis of the various types of heart disease; motion picture showing kymography and laminagraphy.

HUBERT B. PEUGNET and FRANK URBAN, Washington University School of Medicine, St. Louis:

Effect of Vitamin C on the Contraction Height of the Frog Heart: Exhibit showing effect of vitamin C on the contraction height of the frog heart; using isolated hearts of *Rana pipiens* perfused at room temperature with bicarbonate Ringer's solution and vitamin C.

BENJAMIN A. GOULEY, Philadelphia:

Lung Changes Produced by Rheumatic Fever and Their Role in the Development of Rheumatic Heart Disease: Exhibit of microscopic sections of the parenchymal and vascular pulmonary lesions in rheumatic fever; demonstration of the chronic pulmonary lesions seen in association with chronic rheumatic heart disease.

S. A. WEISMAN, University of Minnesota, Minneapolis:

Clinical and Experimental Studies on Quinidine: Exhibit of charts illustrating the length of time quinidine remains in the blood, heart muscle and other organs after intravenous and oral administration; follow-up study on the ambulatory treatment of auricular fibrillation and the method used.

JULIUS JENSEN, St. Louis:

The Heart in Pregnancy: Exhibit of tables and graphs summarizing the present knowledge of the subject of the heart in pregnancy; the various physiologic changes in the cardiovascular system during pregnancy; the effects of the various factors which influence the prognosis and treatment in pregnant women with rheumatic heart disease and other forms of heart disease.

G. E. HALL, University of Toronto, Toronto:

Heart Disease; an Experimental Study: Exhibit depicting (a) experimental disturbance in regulation of autonomic nervous system shown by electrocardiograms, photomicrographs and clinical charts of animals with "heart disease" produced by injections of acetylcholine, vagus stimulation, adrenalectomy and the like, with a possible correlation; (b) coronary artery

reflexes in acute experimental occlusion shown by cleared specimens, mortality tables, diagrams of reflex arc, electrocardiograms and photomicrographs, establishing the presence of a nervous mechanism in the serious effects of coronary occlusion; (c) possible clinical interpretation of experimental results shown by cleared heart specimens of human beings of varying ages and a series of cleared dog hearts showing progressive revascularization of infarcted area with corresponding electrocardiograms; photomicrographs showing similar healing process.

MELVIN H. KNISELY, University of Chicago, Chicago:

The Fused Quartz Method of Illuminating Living, Internal Organs for Microscopic Study: Exhibit showing the fused quartz method of illuminating living, internal organs for microscopic study; colored microscopic motion pictures of the capillary circulation in Amblystoma tigrinum brain and in frog lungs, kidney glomeruli, adrenal gland, striated and smooth muscle, and liver, showing that in no two organs is the capillary circulation the same and that the capillary circulation is in each organ integrated with the functioning of that organ.

ST. LOUIS CARDIAC CLUB, St. Louis:

Syphilis of the Cardiovascular System: (For description of exhibit see Educational Classification.)

GRAHAM ASHIER, GEORGE WALKER and FRANK HOECKER, University of Kansas, Kansas City:

Lag-Screen Electrocardiograph for the Instant and Continuous Viewing of Electrocardiograms: Exhibit of charts, diagrams and photographs describing the lag-screen electrocardiograph giving the physical principles and clinical uses; demonstration of a lag-screen belt built in an electrocardiograph machine and two forms of separate attachments, also a cathode ray all-electric lag-screen electrocardiograph machine.

COMMITTEE FOR THE STANDARDIZATION OF BLOOD PRESSURE READINGS, New York:

Standard Method for Taking Blood Pressure Readings: (For description of exhibit see Educational Classification.)

J. D. SPILLANE, Massachusetts General Hospital, Boston:

Diseased Hearts and Volumetric Reconstructions: Exhibit of life-size models of diseased hearts illustrating the commoner forms of heart disease and their effects on the size and shape of the heart and its chambers and on surrounding structures; photographs illustrating the method employed in making the models.

AMERICAN HEART ASSOCIATION, New York:

Educational and Exhibit Material of the American Heart Association: (For description of exhibit see Educational Classification.)

CLAYTON J. LUNDY, Rush Medical College, Chicago:

The Electrocardiographic Registration of the Heart in Health and Disease: Exhibit of charts depicting the electrocardiographic registration of the heart in health and disease, especially the normal heart beat, extrasystoles, paroxysmal tachycardia, auricular fibrillation, auricular flutter, heart block, arteriosclerotic heart disease and rheumatic heart disease; motion pictures on these subjects will be shown in an adjoining area.

MOTION PICTURES

Motion pictures on subjects related to heart disease will be shown continuously in an area adjoining the exhibits on heart disease. Among the pictures to be shown will be the following:

GRAHAM ASHER, Kansas City:

Electrocardiograph Readings.

WILLIAM H. STEWART, New York:

Cardiac Cine-Fluorography: Motion pictures of the fluoroscopic image of common cardiac lesions.

CLAYTON J. LUNDY, Rush Medical College, Chicago:

The Normal Heart Beat; Extrasystoles: Six Types; Paroxysmal Tachycardia: Six Types; Auricular Fibrillation; Auricular Flutter; Heart Block: two reels (Includes Bundle Branch Block); Arteriosclerotic Heart Disease: three reels—(a) Coronary Thrombosis, (b) Early Chronic Coronary Arteriosclerosis; Heart Disease, (c) Late Stages of Coronary Arteriosclerosis; Rheumatic Heart Disease: one reel—(o) Early Signs, (b) Late Signs.

EDUCATIONAL CLASSIFICATION

Government and National Organizations

The educational exhibits include those exhibits from national and state organizations and government institutions which are put on in the name of the institution rather than of individuals and which are intended to show progress in the particular activities with which those institutions deal.

These exhibits are not open to medal awards, but a certificate of merit is presented to the best exhibit in the classification.

The exhibits listed under Exhibit Symposium on Medical Education, Hospitals and Licensure also belong in this classification.

ASSOCIATION OF LIFE INSURANCE MEDICAL DIRECTORS OF AMERICA, New York:

Life Insurance Medicine; Procedures and Studies: Exhibit of films and charts illustrating teleroentgenkymography; normal films together with those showing various types of heart disease; films and charts showing spontaneous pneumothorax; charts showing the efficiency of the Kline test; mortality from hypertension, tobacco and other sources; charts indicating results from sugar tolerance tests.

ST. LOUIS CARDIAC CLUB, St. Louis:

Syphilis of the Cardiovascular System: Exhibit demonstrating the effects of syphilis on the cardiovascular system by pathologic specimens, gross and microscopic illustrations, charts of diagnosis and aids thereto; method of treatment, prognostic and statistical charts; importance as a form of preventable heart disease; public health aspects and relation to syphilitic control.

COMMITTEE FOR THE STANDARDIZATION OF BLOOD PRESSURE READINGS, New York:

Standard Method for Taking Blood Pressure Readings: Exhibit of charts and apparatus showing the standard technique adopted by the Committee for the Standardization of Blood Pressure Readings of the American Heart Association and the Cardiology Society of Great Britain and Ireland; common causes of error in taking blood pressure readings will be emphasized.

AMERICAN HEART ASSOCIATION, New York:

Educational and Exhibit Material of American Heart Association: Exhibit of material including books, pamphlets and leaflets on various phases of cardiovascular disease.

AMERICAN SOCIETY FOR CONTROL OF CANCER, New York:

Diagnosis of Cancer: Exhibit showing a clinic on cancer, with cases of cancer in each booth, showing cancer of the extremities, head, neck and mouth, illustrating standard forms of treatment such as surgical, roentgen and radium and these methods in combination.

MISSOURI CANCER COMMITTEE, AMERICAN SOCIETY FOR THE CONTROL OF CANCER, St. Louis:

Fight Cancer With Knowledge: Exhibit showing factors in a campaign for the control of cancer.

AMERICAN COLLEGE OF SURGEONS, Chicago:

Cancer and Hospitals: Exhibit of charts showing the work of the College on cancer in hospitals.

AMERICAN MEDICAL ASSOCIATION:

Council on Physical Therapy: Exhibit consisting of demonstrations of apparatus pertaining to hearing amelioration; charts on the work of the Council regarding the standardization of audiometers and the investigation of hearing aids.

AMERICAN SOCIETY FOR THE HARD OF HEARING, Washington, D. C.:

Exhibit giving information regarding the prevention of deafness, the conservation of hearing, hearing tests, lip reading and hearing devices; posters and charts emphasizing the four-point program of the Society, viz. prevention, conservation, alleviation and rehabilitation.

BUREAU OF ANIMAL INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE, Washington, D. C.:

Animal Pathology and Parasites: Exhibit includes wax models of specimens showing abnormal conditions with normal conditions for comparison; specimens of ticks and lice; and transparent tube of worm parasites.

BUREAU OF HOME ECONOMICS, UNITED STATES DEPARTMENT OF AGRICULTURE, Washington, D. C.:

Study of Vitamin A Requirements and Vitamin A Intake of Families of Wage Earners: Exhibit of charts visualizing the variations in vitamin storage, vitamin A requirements and carotene requirements of human subjects in parallel with vitamin A intake of the wage earner families; display of publications, small charts and graphs.

NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS, New York:

The Doctor's Part in Sight Conservation: Exhibit illustrating the various aspects of prevention of blindness and their relationship to the medical profession, together with a presentation of the services which the Society is prepared to extend to the doctor as an individual, as well as to the medical profession as a whole.

MISSOURI STATE MEDICAL ASSOCIATION, COMMITTEE ON CONSERVATION OF EYESIGHT, St. Louis:

Exhibit of charts, displays and pictures showing how the Committee on Conservation of Eyesight of the Missouri State Medical Association is endeavoring to educate the citizens of the state as to the necessity of proper care of their eyes; how a speakers' committee is always able to furnish a speaker and a motion picture for lay audiences with special efforts to appear before junior high and high schools, college and civic clubs, as well as medical societies; exhibits shown at medical and other conventions.

AMERICAN PHARMACEUTICAL ASSOCIATION, Washington, D. C.:

National Formulary Preparations: Exhibit of National Formulary preparations of interest to prescribing physicians; examples of preparations of therapeutic importance representing convenient and satisfactory dosage forms, and of vehicles designed to aid the physician in prescribing attractive and palatable prescriptions.

AMERICAN PHYSIOTHERAPY ASSOCIATION, Chicago:

Exhibit of unusual photographic studies of muscles; residual effect of anterior poliomyelitis; miniature physical therapy department with posters showing photographs made by Harvard Infantile Paralysis Commission; three dimension model of a physical therapy department.

AMERICAN MEDICAL ASSOCIATION:

Bureau of Investigation: Exhibit of charts showing the recent work of the Bureau of Investigation.

AMERICAN MEDICAL ASSOCIATION:

Cooperative Exhibit of the Council on Pharmacy and Chemistry, the Council on Foods, and the Council on Physical Therapy, in conjunction with the Bureau of Legal Medicine and Legislation: Material to illustrate how the new Food, Drug and Cosmetic Act may change some heretofore prevailing practices with which changes physicians should be familiar.

COMMITTEE ON NONSPECIFIC THERAPY OF SYPHILIS, DIVISION OF VENEREAL DISEASES, UNITED STATES PUBLIC HEALTH SERVICE, Washington, D. C.:

Comparative Evaluation of Malaria with Mechanotherapy in the Treatment of Dementia Paralytica: Exhibit of graphic illustrations showing relative effects of two methods of therapy in dementia paralytica on the end clinical results and on the blood and spinal fluid reactions; data forming the basis for the evaluation have been consolidated from the records of ten of the larger clinics of the United States.

AMERICAN HUMAN SERUM ASSOCIATION, Milwaukee:

Human Convalescent Serum: Exhibit of photographs and apparatus used in the collection, preparation and dispensation of human convalescent serum as well as charts showing the results of prophylaxis and treatment following the use of human convalescent serum in various contagious diseases.

CHILDREN'S BUREAU, UNITED STATES DEPARTMENT OF LABOR, Washington, D. C.:

Services for Crippled Children Under the Social Security Act: Exhibit depicting various aspects of the program of services for crippled children developed throughout the country under the

Social Security Act, illustrating location, diagnosis, hospitalization and aftercare of crippled children, and the part which is being played in the work of the official state agencies by physicians and surgeons, public health nurses, social workers and others.

AMERICAN ASSOCIATION OF MEDICAL SOCIAL WORKERS, Chicago:

Exhibit of charts showing centers approved for education in medical social work and distribution of graduates; books, pamphlets and reports of studies on the social component in illness; participation in the teaching social aspects to medical students and others.

MUNICIPAL TUBERCULOSIS SANITARIUM, Chicago:

Municipal Tuberculosis Sanitarium School Survey: Exhibit of charts giving accurate figures of number of children tested, the number found positive by tuberculin (Mantoux) test and subsequent roentgenograms; demonstration of the technic of the Mantoux test.

NATIONAL TUBERCULOSIS ASSOCIATION, New York:

Pulmonary Tuberculosis and Chest Diseases: Demonstrations of roentgen-ray films on pulmonary tuberculosis and chest diseases will be made by specialists in this field.

U. S. PHARMACOPEIAL CONVENTION, Philadelphia:

United States Pharmacopeia, Eleventh Revision: Exhibit of pharmacopeial preparations and chemicals and a demonstration of the use of these in prescription practice.

AMERICAN OCCUPATIONAL THERAPY ASSOCIATION, New York, N. Y.:

Exhibit of charts, photographs, case histories and other objects presenting the principles of occupational therapy and the results of such treatment.

AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS, Denver:

Registry of Medical Technologists: Exhibit of charts teaching the importance of employment by hospitals and physicians of properly trained medical technologists; charts giving data regarding approved training schools; descriptive literature; blank forms.

AMERICAN COLLEGE OF CHEST PHYSICIANS, St. Louis:

Differential Diagnosis of Pleurisy with Effusion: Exhibit of roentgenograms of the chest, accompanied by a brief history of each case and with autopsy reports in some cases, illustrating about twenty different types of underlying pathologic lesions of the chest, probably causing the effusion; diagnosis of pleurisy with effusion is an incomplete one unless the underlying pathologic lesion is recognized in the diagnosis.

EXHIBIT SYMPOSIUM ON MEDICAL EDUCATION, HOSPITALS AND LICENSURE

The exhibit symposium on medical education, hospitals and licensure is presented with the cooperation of the Council on Medical Education and Hospitals.

IOWA STATE MEDICAL SOCIETY, Des Moines:

Ten Years of Graduate Medical Education in Iowa: Exhibit of a composite map showing all the courses which have been presented in Iowa during the past ten years; maps showing the progress Iowa has made each year and programs which have been presented; the total enrolments in the courses, the complete activities for the period of ten years, and the details of the courses; programs include the subjects, lecturers and locations of the courses which have been conducted in the state.

OKLAHOMA STATE MEDICAL ASSOCIATION, COMMITTEE ON POSTGRADUATE MEDICAL STUDY, Oklahoma City:

Graduate Teaching in Obstetrics: Exhibit portraying the administration and operation of the two year program on graduate teaching in obstetrics in the state of Oklahoma; colored maps showing locations of teaching centers and location of every registrant; aids used in teaching and pertinent information regarding the courses; pamphlet giving the history and methods of operation of postgraduate medical teaching in Oklahoma since 1925.

MEDICAL SOCIETY OF VIRGINIA, University:

Graduate Medical Instruction in Virginia: Exhibit of maps and charts showing instruction in pediatrics, instruction in

obstetrics, statistics on pediatrics and statistics on obstetrics; printed sample programs.

TENNESSEE STATE MEDICAL ASSOCIATION, Nashville:

Educational Program: Exhibit of a chart showing Educational Committee with subcommittees, with maps of Tennessee, letters of appreciation from doctors taking the courses, claiming results to themselves by reason of the instruction, and charts and teaching aids used in the programs; course outlines, forms of letter announcements and mimeographed descriptive pamphlets for distribution.

NORTH CAROLINA STATE MEDICAL SOCIETY, Raleigh:

Graduate Medical Education in North Carolina: Exhibit of descriptive, statistical and illustrated material showing graduate medical education programs of the North Carolina State Medical Society, the North Carolina State Board of Health, the University of North Carolina, Duke University and Wake Forest College from 1929 to 1939.

AMERICAN HOSPITAL ASSOCIATION, Chicago:

Library and Service Bureau: Exhibit of graphs, charts, package libraries, publications, books and literature of hospital interest.

ST. LOUIS CLINICS, St. Louis:

Exhibit demonstrating the activities of the St. Louis Clinics, an organization which holds annual clinical conferences; illustration of the various institutions in St. Louis used for these clinical conferences and including all of the grade A hospitals in St. Louis and those of the two medical schools.

AMERICAN MEDICAL ASSOCIATION:

Council on Industrial Health: Exhibit of posters on principal problems affecting industrial health, present agencies involved in control of industrial hazards, and present status of undergraduate and graduate teaching of industrial hygiene.

AMERICAN MEDICAL ASSOCIATION:

Council on Medical Education and Hospitals: Exhibit featuring the survey of medical education and status of medical colleges; graduate education and continuation courses for physicians; approved residencies in specialties-list and revised essentials; approved internships-list and revised essentials; hospital facilities in the United States; approved schools of laboratory technic; physical therapy and occupational therapy; publications of the Council.

DELAWARE-BLACKFORD COUNTY MEDICAL SOCIETY, Muncie, Ind.:

Middletown Modernizes Medicine; The Indiana Plan as Adapted by the Delaware-Blackford County Medical Society: Exhibit outlining the medical and lay education program as applied by an average sized county medical society; this program is an outgrowth of the Indiana Plan and includes lay education along the lines of preventive medicine and graduate medical education.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES, Chicago:

Exhibit of charts showing results of educational studies made on applicants for admission to medical schools; accomplishment of students listed according to arts colleges in which preparation for study of medicine was made; correlation of scholarship in arts and in medical colleges; analysis of entrance credentials and correlation with work in medical school; comparative accomplishment of men and women students; data on the various activities of the Association of American Medical Colleges.

ADVISORY BOARD FOR MEDICAL SPECIALTIES, Pittsburgh:

Exhibit of charts, graphs and literature describing the work of the Advisory Board for Medical Specialties and of the examining Boards for Certification in medical specialties, including the American Boards of Ophthalmology, of Otolaryngology, of Obstetrics and Gynecology, of Dermatology and Syphilology, of Pediatrics, of Psychiatry and Neurology, of Radiology, of Orthopedic Surgery, of Urology, of Pathology, of Internal Medicine, and of Surgery (of Anesthesiology as an affiliate of the American Board of Surgery).

NATIONAL BOARD OF MEDICAL EXAMINERS, Philadelphia:

Exhibit of charts describing the work and progress of the National Board of Medical Examiners and a graphic presentation of the results of its examinations.

The TECHNICAL Exposition

A showing by more than 240 Firms

**IMPROVED APPARATUS
and INSTRUMENTS**

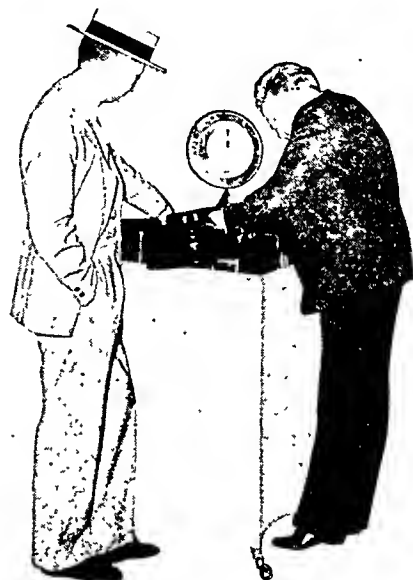
**LATEST BOOKS • SPECIAL FOODS
NEW REMEDIES**

★ To a busy man an opportunity to see a compact, comprehensive panorama of new developments in his field is too important to miss. He realizes the value of a quick check-up on new ideas to guard against overlooking something of definite value. For medical men, the yearly Technical Exposition offers this opportunity.

★ Here, in a short five-day span, the huge cornucopia of medical sciences and services will be displayed for the benefit of the physician who comes to the Convention. From the time he sets foot in the huge Convention Hall, until his departure, he will be in lively contact with the vibrant progressive pageant of industry serving the profession. Like milestones of progress, exhibits will highlight new improvements in products or services—forward strides in manufacturing—technical advances of benefit to the doctor.

★ In a true spirit of service, nearly one thousand highly trained men, representing over 240 firms, will be on hand to help bring the exhibits to life—make them a dramatic summary of the year's progress in pharmaceuticals, biologicals, medical books, instruments, apparatus, electrical equipment, dietetic products, and other specialized articles and services. The physician can feel free to inspect all exhibits without any feeling of obligation.

★ Thus, St. Louis, "the city of a thousand sights" will add a thousand educational stimuli through the medium of the Technical Exposition. From 8:30 A. M. to 6:00 P. M. each day and until noon on Friday, the Exposition will be in full activity. By visiting the exhibits before, after, or between meetings, the physician will not only add to his store of knowledge, but will meet old friends and make many new ones.



APPARATUS AND INSTRUMENTS

A. S. ALOE COMPANY

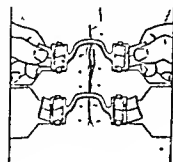
With its home offices in St. Louis, the Aloe Company is enabled to show an elaborate exhibit, actually an entire aisle comprising complete equipment for the physician and his office. Featured will be the new Aloe X-Ray, designed expressly for every necessity in general practice; Aloe Steelcine Furniture; the new Aloe Short Wave Diathermy; and complete clinical laboratory equipment. Booths 68, 69, 70, 71 and 72.

AMERICAN HOSPITAL SUPPLY CORP.

At Booth 133 you will see new improvements in equipment for vascular gymnastics and intermittent venous occlusion. There will be periodic demonstrations of intravenous therapy, illustrated discussions on prevention of peritonitis, reports on the latest motorless suction siphonage units, and the nasal administration of oxygen by a device which properly humidifies oxygen. Be sure to save at least 15 minutes to investigate these exhibits.

AMERICAN MEDICAL SPEC. CO., INC.

In Booth 159 will be found four interesting and outstanding specialties: (1) the Wound Bridge and its applications; (2) the Amesco Oscillometer which takes blood pressure without need of a stethoscope; (3) the Flexo Pessary and (4) the A.B.C. Zipper Blood Pressure Cuff. Representatives will be glad to demonstrate all of these items.



AMERICAN SAFETY RAZOR CORP.

Registered nurses will be on hand to welcome visitors to the A. S. R. Surgeon's Blades exhibit. If you want to know more about these keen, uniform blades, be sure to visit Booth 223 and talk to Miss Stewart and Miss Bard, who, from personal experience and observation can answer your questions. They will gladly explain the various uses of the blades—9 types in all, to suit every need.

(Continued on next page)

AMERICAN STERILIZER COMPANY

This exhibit, occupying Booth 4 and a portion of Booth 3, will show the visitor operating tables, surgical lights, and sterilizers of latest design.

BARO-PARKER COMPANY, INC.

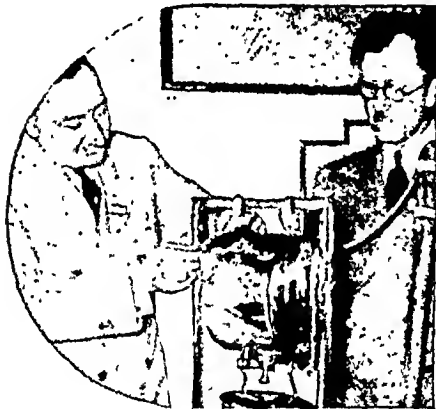
Among the Bard-Parker products exhibited at Booth 186 will be Rib-Back Blades, Renewable Edge Stainless Steel Scissors, Lahey Lock Forceps and Hematological Case for obtaining blood samples at the bedside.

BECTON, DICKINSON & CO.

In Booths 206, 207, 208 and 209 Becton, Dickinson will again provide a demonstration of glass blowing as applied to the making of all glass hypodermic syringes and fever thermometers. In addition to this, complete displays of instruments associated in the various fields of practice will be available to all physicians.

CAMERON SURGICAL SPECIALTY CO.

The new Cameron Projector and Lempert-LeMee Headlight will be demonstrated in Booths No. 55 and 238. Latest developments in electrically lighted diagnostic and operating instruments for all parts of the body will be shown. Of special interest will be the new inexpensive office model Radio Knife, Combination Spark-Gap & Tube Electro-Surgical Unit, and other electro-surgical units for cutting, coagulating, desiccation and fulguration in all sizes from the office model up to the hospital unit.

**WILMOT CASTLE COMPANY**

Among the items to be shown by the Castle Company, Booth 197, will be a display of modern surgical lights. The representatives will be glad to demonstrate the ease with which these lights can be positioned and adjusted.

CLAY-ADAMS COMPANY

New developments in centrifuges, anatomical models, charts, skeletons, obstetrical manikins, surgical and laboratory instruments, and specialties will be shown in Booth 114. A feature of the display will be a new low-priced Bay-Jacobs miniature Obstetrical Manikin made up of an aluminum female pelvis and fetal skull. The centrifuge exhibit will include a new arrangement.

**CRESCENT SURGICAL SALES CO., INC.**

Convention visitors are invited to call at Booth 61 and see just how Crescent's Mikro-Keen and Rigioposed blades, with forty years' experience back of them, are made. Free samples will be available for the asking.

DEVILBISS COMPANY

The complete DeVilbiss line of atomizers, steam vaporizers and nebulizers will be on display at Booth 163. Specially featured in the exhibit will be illustrations based on x-ray research, graphically showing the coverage afforded by the atomizer in application of solutions to the nose and throat. Copies of the illustrations for reference may be secured from the DeVilbiss representative in charge.

E & J MANUFACTURING CO.

An unusually interesting illustration of respiration during mechanical resuscitation will be offered by E & J Company's exhibit of "breathing mother and baby," Booth 266. Behind the transparent "chest wall" of the "mother" one will be able to observe rhythmic rise and fall of the "lungs" and the excursion of the "diaphragm" during resuscitation treatment. Plan to see this educational display.

**FOREGGER COMPANY, INC.**

A new type of individual flow meter apparatus for anesthesia, helium and oxygen therapy equipment, resuscitation apparatus and a complete line of intratracheal apparatus and accessories will be on display at the Foregger Booth, No. 53. The helium apparatus to be shown will be of interest not only to the hospital personnel and anesthesiologist but to the general practitioner as well inasmuch as it is suitable for office and bedside use.

**HAMILTON-SCHMIDT SURGICAL CO.**

Specialties of several manufacturers will be shown by Hamilton-Schmidt, local representatives, at Booth 33: Physical therapy equipment of Burdick Corp.; office equip-

adapted for hospital use. There will also be a full display of Ohio equipment, supplies and gases in which there are some new developments which merit investigation.

PELTON & CRANE COMPANY

In Booth 280, Aisle A, Pelton and Crane will exhibit all models of standard 3-Speed and Super-Automatic Sterilizers, both table models and cabinet outfits. Also on display will be Pelton cuspidors and operating lights. The exhibit will be in charge of Mr. J. L. Bunch, who will welcome your questions and appreciate your visit.

GEORGE P. PILLING & SON CO.

The Miller-Abbott double lumen tube for small intestinal intubation will be included in the Pilling exhibit, Booth 183; also the Crutehfield tongs for treatment of the fractured dislocations of the cervical vertebrae; the armamentarium of Dr. Max Halle used in nasal surgery; the Kasper headlight; the bronchoscopic instruments as made for and used by the Chevalier Jackson Clinics; thoracic instruments; and new and important instruments in general and rectal surgery.

PROMETHEUS ELECTRIC CORP.

The complete Prometheus line of medical and surgical products will be on display at Booth 218. Among the items shown will be pressure sterilizers, stainless steel instrument sterilizers, hospital equipment and infra-red lamps. Various improve-

LIST OF EXHIBITORS

Abbott Laboratories.....North Chicago, Ill.
Adlanco X-Ray Corp.....New York City
Acfa Anseo Corp.....Binghamton, N. Y.
Allergen-Proof Enemas, Inc.....Cleveland
Allergin Products Co.....Newton, Mass.
Allison Co., W.
Almay Pharmacal
Aloe Co., A. S.....St. Louis
Amer. Can Co.....New York City
Amer. Congress on Obs. and Gyn.....Chicago
Amer. Cystoscope Makers, Inc.....Bronx, N. Y.
Amer. Hospital Supply Corp.....Chicago
American Medical Association.....Chicago
Amer. Med. Specialties Co., Inc.....New York City
Amer. Opticat
Amer. Physlela
Amer. Rescarel
Amer. Safety 1

Amer. Seal-Kap Corp.....Long Island City
Amer. Sterilizer Co.....Erie, Pa.
Appleton-Century Co., Inc., D.....New York City
Arlington Chemical Co.....Yonkers, N. Y.
Armour Laboratories.....Chicago
Aznoc's Nat. Phys. Exchange.....Chicago
Bard-Parker Co., Inc.....Danbury, Conn.
Bauer and Black.....Chicago
Baum Co., Inc., W. A.....New York City
Baush & Lomb Optical Co.....Rochester, N. Y.
Beck-Lee Corp.....Chicago
Beclon, Dickinson & Co.....Rutherford, N. J.
Bell & Howell Co.....Chicago
Best Foods, Inc.....New York City
Billmeyer-Knoll Corp.....Orange, N. J.
Bircher Corp.....Los Angeles
Binkiston's Son & Co., Inc., P.....Philadelphia
Borden Co.....New York City

ment of Hamilton Mfg. Co.; Bard-Parker and Stille instruments; and Sterisol intravenous ampoules.

KITCHEN KATCH-ALL CORP.

A simple, but efficient All-Nite Vaporizer which provides plain or medicated vapors for periods up to 12 hours, will be demonstrated at Booth 100. Also a Miniature Hospital Formula Room Outfit for baby at home will be shown.

MACGREGOR INSTRUMENT COMPANY

A complete line of Vim products will be displayed in Booth 92. Included in this unusual exhibit will be a full line of Vim Needles of Firth-Brenley Stainless Steel, Vim Green Emerald Syringes and some new Vim specialties. In addition, the MacGregor Instrument Co. will show a complete assortment of the English-made Iron Arm Surgeons' Needles.

V. MUELLER & COMPANY

Such items of unusual interest as the new Cope-deMartel clamp, Devine and Ochsner-DeBakey spur crushers, simplified Seuderich Callahan Fracture Instruments, and Dr. Dimitri's new Contract Suction Disc are a few of the many highlights of V. Mueller's big exhibit in Booths 38 and 39. In addition to the comprehensive instrument display, the Herb-Mueller Ether-Vapor and Vacuum Apparatus and other modern equipment will attract much attention.

OHIO CHEMICAL & MFG. CO.

In Booth 167 will be found a complete line of the well-known Heldbrink Kinetometer Gas Machines and Oropharyngeal Outfits, in addition to other types of therapy equipment which are especially

ments and re-styling of items make this one of the most interesting of Prometheus exhibits.

SAFETY GAS MACHINE CO., INC.

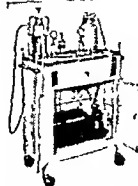
The McGurdy & Augustana Models equipped with their new improved CO₂ Absorber unit, which increases the efficiency and lowers the breathing resistance, will be shown in Booth 107. The exhibit will be in charge of an experienced anesthesiologist who will be glad to advise on anesthetic department problems.

SCANLAN-MORRIS COMPANY

Several new items of surgical equipment will be included in the Scanlan-Morris exhibit, Booth 224. Their latest major operating table will be demonstrated, together with the famous Operay Mullbeam and Surg-O-Ray surgical lights. A clinic sterilizing outfit, consisting of autoclave and 3-gal. water sterilizer, will be on display. Visitors will also have opportunity to inspect samples of genuine Swedish made Stille instruments.

J. SKLAR MANUFACTURING CO.

The Sklar exhibit, Booth 2, will feature new suction and pressure apparatus, including the Improved Tompkins Portable Rotary Compressor, the DeLuxe Tompkins, the new Imperial kins, the new Imperial Apparatus for ear, nose and throat work, Ralks' Ideal Unit and clinic Unit for office and clinic, and the new, improved, heavy duty hospital model of the Bellevue Suction and Pressure Unit.



STORZ INSTRUMENT COMPANY

In Booth 26 the Storz Instrument Company will show, among other new models of instruments, their new and improved American made stainless steel Lithotripsy Adenotome. A wide selection of instruments and equipment for the eye, ear, nose and throat specialties will be on display. Mr. Eric Storz and Mr. Fred S. Watson, who will be in attendance, will be glad to discuss these instruments and demonstrate the line of Gomco Surgical Pumps.

MAX WOCHER & SON COMPANY

True to tradition, Wochoer's will feature several brand-new items of interest to medical and surgical men, at Booths 117 and 143. Foremost among these is the new Miles-Lewis Explosion-Proof Operating Light, which banishes fear of explosion due to faulty lighting equipment. Worth of note is the fact that this light bears the seal of approval of the Underwriters Laboratories. In addition, there will be shown the Mont R. Reld operating table and other instruments and equipment.

ZIMMER MANUFACTURING COMPANY

The complete line of Zimmer orthopedic equipment will be shown in Booth 289. The exhibit will be an interesting one for any surgeon who handles fractures, inasmuch as the firm has specialized in stainless steel bone instruments. Splints of improved design, stainless steel bone plates

FROBER-FAYBOR COMPANY

Among the instruments to be shown by Frober-Faybor at Booth 11 will be their low-priced Visual Photometer, Visual Apotometer, and several Bio-Photometer models—all clinical instruments for determining light thresholds in relation to light, sight, visual purple and vitamin A. A research model of a new Audiometer for determining sound thresholds and a Frober-Faybor Colorimeter (rapidly gaining use in running blood tests) will also be on display.

GASTRO-PHOTO LABORATORIES

The new, improved stomach camera, an outstanding development of modern diagnostic apparatus, will be shown at Booth 111. A large number of normal and pathological gastrophotographs will be on display.

GRAWOHL LABORATORIES

An exhibition of Grawohl reagents and equipment for laboratory purposes will be found at Booth 119. Special attention will be devoted to the well-known Giemsa stain for hematological work. Blood grouping tests by means of potent testing sera will also be emphasized, and testing sera of high degree of potency will be shown.

HERZ-LASKER CORPORATION

At Booth 296 visitors will have opportunity to inspect the Office Electrocardiograph, a revolutionary innovation in cardiology, which records heart currents

E. LEITZ, INC.

Ortholux, a modern research microscope in a reversed type of stand with built-in permanently aligned illumination system and a new universal type of substage, will be exhibited in Booth 62. Medical microscopes for bright and dark field, various microtomes, projectors, photomicrographic equipment (including the Panphot—a combination universal microscope and reflex camera) and Leica cameras will also be gladly demonstrated.

TAYLOR INSTRUMENT COMPANIES

The Tycoos exhibit, Booth 151, will display an interesting working model showing the inside of a Tycoos Aneroid Sphygmomanometer and demonstrating how metal diaphragm chambers operate the Tycoos, in stead of a coil spring. Don't miss the action display showing how a Mercutorial Manometer becomes inaccurate when tipped slightly, such as when resting upon a bed. Be sure to see also the new, flat glass Binocular fever thermometer and the Panax "glass boot" for treating circulatory diseases.

WELCH ALLYN COMPANY

At the Welch Allyn Booth, No. 136, will be seen the latest advances that have been made in the manufacture of laryngoscopes, the demand for which in cases of asphyxiation is growing throughout the country, and also the new complete endoscopic sets with telescopic attachments which have added remarkably to visualization. The newest features in eye, ear, nose and throat instruments will also be incorporated in the instruments shown at this booth.

LIST OF EXHIBITORS

Buck X-Ray Corp.	St. Louis	Chas. Adams Co. Inc.	New York City
Burdick Corp.	Milton, Wis.	Collins Inc. Warren E.	Boston
Calco Chemical Co., Inc.	Bound Brook, N. J.	Conformal Footwear Co.	St. Louis
Cambridge Instr. Co., Inc.	New York City	Cooperative Medical Adv. Bui.	Chicago
Cameron Surg. Spec. Co.	Chicago	Corn Prod. Sales Co.	St. Louis
Camp & Co. S. H.	Jackson, Mich.	Cradle Car Service Inc.	St. Louis
Camillon Co.	Waukegan, Ill.	Cream of Wheat Corp.	Minneapolis
Castle Co. Willmet	Rochester, N. Y.	Crescent Surgical Sales Co.	New York City
Cavo Co.	San Antonio, Texas	Curlville Products Inc.	New York City
Cerevim Products Corp.	New York City	Cutler Laboratories	Berkeley, Calif.
Cerophyl Laboratories	Kansas City, Mo.	Davies Rose & Co., Ltd.	Boston
Chappel Bros. Inc.	Rochford, Ill.	Davis Co. F. A.	Philadelphia
Chicago Diet. Sup. House Inc.	Chicago	Davis & Geck Inc.	Brooklyn
Chicago Medical Book Co.	Chicago	Davis Ideal Baby Shoe Co.	Danvers, Mass.
Church & Dwight Co., Inc.	New York City	DePuy Mfg. Company	Warsaw, Ind.
Ciba Pharm. Prod., Inc.	Summit, N. J.	Devereux Schools Inc.	Berwyn, Penna.
Cikoid Surg. Dressing Co.	Marshalltown, Iowa	DeVilbiss Co.	Toledo
Clapp Inc. Harold H.	Rochester, N. Y.	Diagraph Prod. Co. Inc.	New York City

and setwax, Smith-Petersen nails and accessories, hyper-extension frames, fracture bed and orthopedic braces will be featured.

DIAGNOSTIC EQUIPMENT

BECK-LEE CORPORATION

Booth 12 should be of interest to all physicians. Here, Beck-Lee will show both portable and mobile models of quartz string galvanometer electrocardiographs, designed by Charles T. Hurdle. A visit to their booth would be instructive and valuable to physicians interested in complete and accurate cardiac diagnosis.

CURVLITE PRODUCTS, INC.

Some of the most widely publicized medical and dental instruments of the last decade will be on display at the Curvlite exhibit, Booth 148. Demonstrations will show how Curvlite instruments permit the transmission of light directly through the instruments themselves into the operative or diagnostic area—cold, brilliant light without interference with the operator.

ELECTRO SURGICAL INSTRUMENT CO.

At the Electro Surgical exhibit, Booth 10, there will be shown a complete line of electrically lighted surgical instruments, including the improved Baasch-Bumpus resectoscope, Bueh, Lench, Tuttle, and Paulson photo sigmoidoscopes, Jackson, Israel and Lynch bronchoscopes, Holmes proctopharyngoscopes and proctoscopes, transilluminators, Brisch and Davis cystoscopes, urethroscopes, and rheostats.

directly in ink on a moving chart so that no dark room development is needed. The machine can also be used to record the heart sounds and in addition serves as an electro stethoscope. Other items to be exhibited are the Weiss Sinusoidal Galvanic Machine, the Langer Ionization Unit, and the Mittelmann Dosage Meter.

JONES METABOLISM EQUIPMENT CO.

The Jones Motor Basal metabolism apparatus will be featured in Booth 64. Visitors will be interested in demonstration of a special feature of this unit—it contains no water and requires no calculation in the determination of the basal metabolic rate.

THE KELLEY-KOETT MFG CO., INC.

In Booths 225, 246, 247 and 248, Keleket will display new x-ray apparatus providing for complete radiographic and fluoroscopic diagnosis. A new mobile unit offering a complete 90 Peak kV 30 MA on wheels for will be demonstrated. It will be on display a complete self-contained diagnostic x-ray unit which offers facilities for fluoroscopy, radiography and Potter-Bucky diaphragm radiography in three positions.

LAMOTTE CHEMICAL PRODUCTS CO.

LaMotte Blood Chemistry Outfits will be exhibited in Booth 75. Recent developments

to be shown include the LaMotte outfits for determining sulfapyridine in blood and urine and the LaMotte Falling Drop densitometer for determining blood proteins. Information will also be available concerning the determination of sulfapyridine in blood and urine.



DIETETIC PRODUCTS

AMERICAN CAN COMPANY

All registrants at the Convention are cordially invited to call at Booths 47 and 48 where information will be available concerning those aspects of commercially canned foods which are of greatest interest to the medical profession. Literature on canned foods, designed specifically for the physician's use, will also be on display.

BEST FOODS, INC.

Doctors are invited to visit Booth 109 and taste New Auroa, a wholesome spread for bread—a delicious, easily digested and nourishing vegetable margarine. The exhibit, featuring the addition of Vitamin A to the product, will also display composite results of recent assay work conducted by three independent food laboratories. This will be an excellent opportunity to become acquainted with the digestibility of Auroa, which has been demonstrated by work on human beings.

CARNATION COMPANY

In the Carnation exhibit in Booth 181 will be displayed an interesting model of the famous Carnation Milk Farms where high producing stock is developed to improve the dairy herds supplying the many Carnations. The work of the "milkmaid" in supervising the scientific process of producing Carnation Milk will be interestingly shown also.

SCIENTIFIC SUGARS CO.

Specialties in the field of infant diet materials and in Vitamin B Complex therapy will be featured in the Scientific Sugars Booth, No. 46. The firm will show a product made by the aqueous extraction of yeast but substantially free from yeast cells, fats, resins, and inert materials present in dried yeast. Physicians will find that the product is palatable, readily miscible with fruit juices, and excellent to use as a vehicle for iron compounds and other medications. The milk modifier, Carlose, will also be on display.

S.M.A. CORPORATION

At Booths 120 and 275 two beautiful new displays featuring S.M.A. and associated infant feeding preparations developed in the S.M.A. laboratories. Be sure to stop at this exhibit for an interesting chat.



STOKELY BROTHERS & COMPANY

The showing of Stokely's Baby Foods, at Booth 276, will afford opportunity to learn more about their comminuting process, particularly designed to produce a smooth, uniform texture and retain the natural color and garden-fresh flavor of the fruits

Audiometer—a 1939 development—and the Sonotone Audioscope, as well as bone and air conduction hearing aids, will be shown in Booth 156. Also the new Sonotone Audiometer for group testing of school children will be demonstrated. Doctors interested in hearing problems are especially invited to receive a copy of new book on hearing aids.

GRAYBAR ELECTRIC COMPANY, INC.

As national distributors of Western Electric Scientific Equipment, Graybar will feature instruments of interest to the medical profession such as the new Ortho-Technic Hearing Aid, both bone and air conduction, the 4B and 6A Audiometers and the Electrical Stethoscope. Attention will be focused on a map showing the zoning of the 82 Graybar Houses in relation to a nationwide service. Space 149.



MAICO COMPANY, INC.

The widely-used Maico professional audiometer used by otologists in hearing tests and a simplified low-priced model audiometer for public health, school, and general work will be exhibited at Booth 281. Also on display will be amplifying electro-stethoscopes and the Ruckmick Affectometer, which can be used as a lie detector or to measure emotional stability.

F. A. OAVIS COMPANY

For your special pleasure it is suggested that you relax at Booth 219 and examine these new Davis Company books: Reimann's "Treatment in General Medicine," with its new unique up-keep service; Bland's "Practical Gynecology"; Goldberg's "Clinical Tuberculosis"; Delario's X-ray and Radium Therapy; Lederer's "Ear, Nose and Throat"; Blum's "Pediatric Symptomatology and Diagnosis" and Bland's "Practical Obstetrics."

PAUL B. HOEBER, INC.

New books to be included in the Hoebor exhibit, Booth 91, are Reynolds' "Mechanics of the Digestive Tract" and of Ewall, Parsons, Warren and Osborne's "Fever Therapy Technique" will also be shown.

LEA & FEBIGER

At Booth 89 Lea & Febiger will exhibit the following new works: Witherpoon's "Clinical Tumor," Ellis on "Tumor," Lachmann and Haden on "Elementary Anatomy," and "Ophthalmic Fractures and

LIST OF EXHIBITORS

Hoebor, Inc., Paul B. New York City
Hoffmann-LaRoche, Inc. Nutley, N. J.
Holland-Rantos Co., Inc. New York City
Hospital Liquids, Inc. Chicago
Humphreys Roentgen Co. Aurora, Ill.
Hygeia—The Health Magazine. Chicago
Hynson, Westcott & Dunning, Inc. Baltimore
International Vitamin Corp. New York City
Irradiated Erap. Chicago
Jetter & Scheerer Prod., Inc. New York City
Johnson & Johnson. New Brunswick, N. J.
Jones Metabolism Equipment Co. Chicago
Juvenile Wood Products, Inc. Fort Wayne, Ind.
Kelley-K...
Keystone
Kitchen
Knox Gelatine Co. Johnstown, N. Y.

Lakeside Laboratories, Inc. Milwaukee, Wisc.
LaMotte Chemical Prod. Co. Baltimore
Lea & Febiger. Philadelphia
Lederle Laboratories, Inc. New York City
Leitz, Inc., E. New York City
Lepel High Frequency Labs., Inc. New York City
Lewis Mfg. Co. Walpole, Mass.
Libby, McNeill & Libby. Chicago
Liebel-Flarsheim Co. Cincinnati
Lilly & Co., Eli. Indianapolis
Linde Air-Products Co. New York City
Lippincott Co., J. B. Philadelphia
Luzier's, Inc. Kansas City, Mo.
M & R Dietetic Labs., Inc. Columbus
MacGregor Instrument Co. Needham, Mass.
Macmillan Co. New York City
Maico Co., Inc. Minneapolis



and vegetables. Full details concerning this process, as well as the products, will be available at the booth.

VEGEX, INCORPORATED

The results of feeding the whole vitamin B complex will be shown at the Vegex exhibit, including yeast extract and liver extract feedings, separately and together. The series will include thiamin, riboflavin and nicotinic acid fed separately and together with yeast and liver extracts. Vegex, served as a drink and with butter as a sandwich spread, will give an appetizing delight to physicians stopping at the exhibit. Booth 96.

VITEX LABORATORIES, INC.

As usual, those attending the meeting can obtain refreshing drinks of vitamin D milk served at the Vitex milk bar. Booth 110.

HEARING AIDS



DICTOGRAPH PRODUCTS CO., INC.

At Booth 274 will be displayed the Acousticon, which brings custom-fitted hearing to your deafened patients, through the Aurogauge, which selects the assembly best suited to compensate for hearing loss to otologists. The method embodies, whereby, as a vacuum tube wearable portable Acousticon can be fitted to the most difficult case.

SONOTONE CORPORATION

An exhibit of instruments and methods used in fitting electrical hearing aids, including the New Sonotone Continuous Tone

MEDICAL BOOKS



O. APPLETON-CENTURY COMPANY

The entire line of Appleton-Century medical works will be shown in Booth 236, including the thirteen volume "Practitioners Library of Medicine and Surgery" edited by George Blumer; the set of "Postgraduate Surgery" edited by Rodney Main-; and the new 13th edition of Osler's "Principles and Practice of Medicine" with a new editor, Henry A. Christian. Many new volumes will be shown, such as "The Fundamentals of Internal Medicine" by Wallace M. Yater, and "Gross Anatomy" by A. Brazier Howell.

P. BLAKISTON'S SON & CO., INC.

Their complete list of medical texts and references, including the books published since the last convention, will be found in the Blakiston exhibit, Booth 65. Two books of particular interest are: Robinson's "Practice of Medicine" and Marie's "Spanish" the latter designed to be distinctly helpful in clinical investigations and research. The exhibit will be in charge of Messrs. H. T. Turner and E. R. Stetson.

CHICAGO MEDICAL BOOK COMPANY

The display at Booth 49 will present a complete assortment of all the latest medical books of all the publishers, including many new American and English monographs to be seen nowhere else. Here, under one exhibit, you can examine at your leisure all of the recent books. Don't fail to visit this most interesting exhibit.

"Refraction." New editions will include Kanavel's "Infections," and Brown's "Oral Surgery." The exhibit will be in charge of Mr. Leo A. Cleary.

J. B. LIPPINCOTT COMPANY

Among the newer Lippincott publications on display will be Thorek's "Modern Surgical Technique" and Kracke's "Diseases of the Blood and Atlas of Hematology" from which illustrations are being displayed at the World's Fair Medical Exhibit. Other important new works include: Rigler's "Outline of Roentgen Diagnosis," Barborik's "Treatment by Diet" and Imperatori's "Diseases of the Nose and Throat." Booth 1.

MACMILLAN COMPANY

The results obtained from sulfanilamide and sulapyridine therapy in bacterial infections have centered attention on these new drugs. At the Convention in St. Louis the Macmillan Company will have on display the forthcoming book on this subject by Perrin H. Long and Eleanor A. Bliss, nationally known authorities. Also on exhibit will be many other new medical publications. Booth 59.

L. S. MATTHEWS & CO., INC.

Booth 43 will exhibit a comprehensive stock of the best and latest standard medical books, with some curious items and antique volumes in medicine, and a fine collection of reproductions of famous paintings on medical subjects by eminent artists. Get acquainted with the Matthews trade-in plan. Your call at the booth will be appreciated.

C. V. MOSBY COMPANY

In Booth 101 will be shown the following important new medical books by Mosby: Campbell's "Operative Orthopedics," tenth edition of Sutton's "Diseases of the Skin," the new Brickett "Surgical Treatment of the Hand and Forearm In-

sections," Behan's "Cancer," second edition of Gradwohl's "Clinical Laboratory Methods and Diagnosis," and the new second edition of Menkins' "Practice of Medicine." About 150 other standard and currently popular volumes will complete the display.

OXFORD UNIVERSITY PRESS

On display in Booth 117 will be the several new Oxford books covering physiology of anesthesia, clinical electrosurgery, silicoes and schistos, carbon monoxide asphyxia, orthopedic appliances, shock and related capillary phenomena, cranio cerebral injuries and the well known "Oxford Loose-Leaf Medicine," with Oxford monographs on diagnosis and treatment.

W. B. SAUNDERS COMPANY

In Booths 66 and 67 will be shown a complete line of the Saunders books, among them many new books and new editions, including Callander's "Surgical Anatomy," the 1939 Mayo Clinic Volume, Wolf's "Endocrinology," Fluhmann's "Menstrual Disorders," Pelouze's "Gonorrhea," McNally's "Medical



ogy," Murphy's "Medical Law" and Trumper's "Medical Law."

SURGERY, GYNECOLOGY AND OBSTET.

The Saunders books are employed in an line of the pages of the books by Surgeons, its superb printing and illustration, and



OFFICE FURNITURE

W. O. ALLISON COMPANY

In Booth 216 will be shown a representative display of fine physicians' wooden furniture by Allison. Many improvements have, of course, been added since the last convention in San Francisco. It will be of interest to you to see this equipment.

ENOCHS MANUFACTURING CO.

While at the Convention it will pay you to spend a few moments inspecting the latest offerings in line furniture for physicians' offices. At the Enochs Booth, No. 56, will be shown complete office suites designed to meet the needs of the general practitioner or the specialist. In attendance will be an office planning expert who will be glad to help you with your arrangement problems.

HAMILTON MANUFACTURING CO.

In keeping with the present trend toward new and modern professional furniture, Hamilton will feature its newest group, the Nu-Tone Suite. This is an over-size Deluxe set of furniture that provides extra conveniences and extra comforts. The table which will be shown is 3" wider and 4" longer than the ordinary table with a

OPTICAL INSTRUMENTS

AMERICAN OPTICAL COMPANY

This exhibit, in Booths 261 and 262, will feature two of the firm's newest instruments, the Additive Phoropter which provides three points of vital interest to users—prescription accuracy, ease of operation, and patients' comfort—and the Autometer, which provides a method of determining the presence of night blindness. Representatives will demonstrate how it permits a quick and reliable differentiation between normal and abnormal adaptation cases.

KEYSTONE VIEW COMPANY

The Keystone exhibit, Booth 217, will feature the Synoptoscope, for strabismus diagnosis and training. Also on display will be the Tel-Eye-Trainer, which is particularly adapted to post-operative fusion training and asthenopia due to faulty eye coordination other than strabismus. Other exhibits will include Keystone's home training materials including the Correct-Eye-Scope, the Eye Comfort Stereoscope and accessories.

CARL ZEISS, INC.

At Booth 175 a collection of Zeiss microscopes, including the latest models, and accessories, will be featured. Camera



LONDON • PHILA

LIST OF EXHIBITORS

Mallinckrodt Chem. Works.....St. Louis
Maltine Co.....New York City
Mareelle Cosmetics.....Chicago
Mattern Mfg. Co., E.....Chicago
Matthews & Co., Inc., L. S.....St. Louis
McChesky Register Co.....Alliance, Ohio
Metinosh Electric Corp.....Chicago
McKesson Appliance Co.....Toledo, Ohio
McKesson & Robbins, Inc.....New York City
McNell Laboratories, Inc.....Philadelphia
Mead Johnson & Co.....Evansville, Ind.
Mechanical Laboratories, Inc.....Miami, Fla.
Medical Bureau.....Chicago
Medical Case History Bureau.....New York City
Medical Protection Co.....Whitton, Ill.
Mellin's Food Co.....Boston
Mennen Co.....Newark, N. J.
Merck & Co., Inc.....Rahway, N. J.

Merrill Co., Wm. S.....Cincinnati
Meyer Co., Wm.....Chicago
Mosby Co., C. V.....St. Louis
Mueller & Co.....Chicago
National Dairy
National Drug
National Live S
Nelson & Sons, Thomas.....Chicago
Nestlé's Milk Products, Inc.....New York City
Northwestern Mut. Life Ins. Co.....Milwaukee, Wis.
Ohio Chem. & Mfg. Co.....Cleveland
Osborne, Robt.....New York City
Oxford Univ.....Chicago
Oxygen Equip.....Detroit
Parke, Davis & Co.....Boston
Patch Co., E. L.....Towanda, Pa.
Patterson Screen Co.....Detroit
Pellon & Crane Co.....Detroit

the character of its material on all phases of surgery. Illustrations in color, reproductions of famous portraits, and numerous pages on surgical technique will be shown. The many features of the Journal will be pointed out briefly by the accompanying roborophone voice. You are cordially invited to visit Booth 111.

UNIVERSITY PRESSES

Booth 178 will display books and journals from the following university presses: University of Chicago; Columbia University; University of Minnesota; University of Pennsylvania; Princeton University; Stanford University; Yale University; and Colgate Press. A cordial invitation to examine the publications on display is extended to all visitors.

WILLIAMS & WILKINS CO.

As publishers of the famous William Wood books, exhibit 102 will include advance copies of new editions of Stedman's "Medical Dictionary" and May's "Eye." Important new books, such as Fomon's "Traumatic and Plastic Surgery," Yeomans' "Seterosing Therapy," Cowdry's "Problems of Ageing," and new editions of Allen's "Sex and Internal Secretions," Harrison's "Failure of Circulation," with 200 other new and standard books and periodicals will complete the showing.

AMERICAN MEDICAL ASSOCIATION

The journals, pamphlets, reprints and books published by the A. M. A. will be shown at Booths 127 and 150. In conjunction with this exhibit there will be a showing of "Hygiene," The Health Magazine, at one end, and the state medical journals of the Cooperative Medical Advertising Bureau, at the other end. The "American Medical Directory," "Index Medicus" and other well-known A. M. A. publications will be on display.

massive effect that helps to establish a tone of dignity and professional restraint in any office. This new Hamilton furniture will be on display in Booths 214 and 215.

ROYAL METAL MANUFACTURING CO.

If you are interested in learning the many advantages afforded by quality chromium furniture for reception rooms and offices you will want to take time for a visit at Booth 40. Here, in keeping with the demand for this type of furniture, an entire time Royalechrome room will be shown. A plan will be made for your particular needs without obligation.

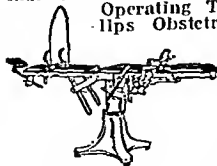


PHILADELPHIA HOSP. SUPPLY CO.

At Booth 298, the Melt Manufacturing Co. and distributor, Philadelphia Hospital Supply Co., will show a new suite of physician's wood furniture in Burl walnut, which has not been shown in its entirety at any medical convention to date. There will also be on display two other suites of physician's furniture, custom built, of genuine American walnut.

SHAMPAINE ASEPTIC STEEL FURN. CO.

The new Steelux line of physicians' examination room equipment, the Century Operating Table, and the Phillips Obstetrical Table will be featured in Booths 30 and 31. The new Martin Table, especially designed for rectal work, will be demonstrated with regard to its adaptability to all types of general examination as well as specialized work.



attachments for photomicrography, as well as Contax Cameras for medical and general photography, will also be shown. Ophthalmic equipment, such as slit lamp outfits, perimeter, retinal and anterior segment cameras, test sets for contact lenses, etc., will be on display. Demonstration by experienced technical representatives and information will be gladly furnished.

SPENCER LENS COMPANY

The Spencer Lens exhibit will feature medical microscopes, equipped for bright field and dark field work; also for blood counting with the Bright-Line Haemocytometer. Several types of Spencer microscopes will be set up for demonstration. Delineoscopes for the projection of color slides, lantern slides, filmstrips or opaque material will be exhibited. The new Quebec Colony Counter and a new Colorimeter will also be shown. Booths 263 and 261.



PHARMACEUTICALS AND BIOLOGICALS

ABBOTT LABORATORIES

You will find a hearty welcome at the Abbott exhibit, Booths 234 and 235, where representatives will be on display. You will be able to take pleasure in discussing new as well as old research items with you. A chat about your experiences with Abbott products (whether favorable or otherwise) will help all to keep 'abreast-of-the-times'.

AMERICAN RESEARCH PRODUCTS

An informative display featuring Vitamin D in the form of Viosterol (A.R.P.I. Process) in Oil, for the pharmaceutical trade, and Vitamin D in evaporated milk, for the fluid milk dealers, will await physicians visiting Booth 131. The story of what the product Embo (Wheat Embryo) can accomplish in cases of Vitamin B deficiency also will be told. Nationally known products of the parent company, General Mills, Inc., will be an interesting part of the exhibit.

ARLINGTON CHEMICAL COMPANY

Featured in Booth 118 will be the Arlington pollen extracts for diagnosis and treatment of hay fever, which are offered this year at a considerable reduction in price. Also a handy diagnostic protein outfit, consisting of eighty of the most common causative factors in allergic conditions, and a full line of food, epidermal and fungi proteins for diagnosis and desensitization. Dr. J. H. Fryer will be in charge.

ARMOUR LABORATORIES

Treatment of dyscrasias of the hematopoietic organs with particular reference to the erythrocyte and granulocyte series will be featured at the Armour exhibit, Booths 188 and 189. Graphs will show the increase in number of granulocytes and erythrocytes brought about by the administration of different preparations. The necessity for, and importance of careful and correct thyroid assay will be explained graphically.

tions about and discuss the well-known Cilia specialties, among which are Digifoline, Dial, Lipodoline, Nupercaine and Vioform. Your call will be welcomed.

CUTTER LABORATORIES

The complete line of Cutter biologicals and closely allied specialties, including their dextrose and other solutions in salfiflasks, will be exhibited. A new development is the ingenious hanging device now being built into the bottom of each salfiflask. It is completely out of the way until needed. In use, forms a sturdy hanger. Booth 226.



DAVIES, ROSE & COMPANY, LTD.

This year, as in the past, visitors will find the exhibit of Davies, Rose both interesting and informative. In Booth 23 Messrs. R. J. Mansfield, William F. Krause, and A. R. Gorham will be in attendance to explain in detail to callers the outstanding qualities of this firm's laboratory productions.

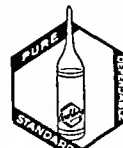
DRUG PRODUCTS CO. INC.

Visit Booth 157 where Hyposols and Pulvoids will be on display. Pulvoids Digitalis Folium, a mode of digitalis standardized by the Sodium Cacodylate, all accepted by the Council on

a showing of the following "Council-Accepted" International Vitamin products: Halibut Liver Oil Plain in Liquid and Capsule form; Halibut Liver Oil with Vitamin D Concentrate in Liquid and Capsule form; Cod Liver Oil Concentrate in Liquid and Capsules; Cod Liver Oil Vitamin Concentrate in Tablets; and Viosterol (A. R. P. I. Process) in Oil.

LAKESIDE LABORATORIES, INC.

Their Council-Accepted Ampoule preparations, particularly ampoules of Dextrose (d Glucose) 50%, Sodium Cacodylate, Mercury Succinimide, Ephedrine Sulfate, Ephedrine Sulfate capsules for oral use, and Ephedrine Hydrochloride 3% for topical use, will be exhibited by Lakeside Laboratories in Booth 73. Members of the research staff will be in attendance.



LEDERLE LABORATORIES, INC.

The Lederle exhibit in Booths 201 and 202 will feature, in animated chart and diagram form, latest therapy on pernicious anemia, pneumonia and scarlet fever. Other new and interesting Lederle drugs and biologicals will also be shown.

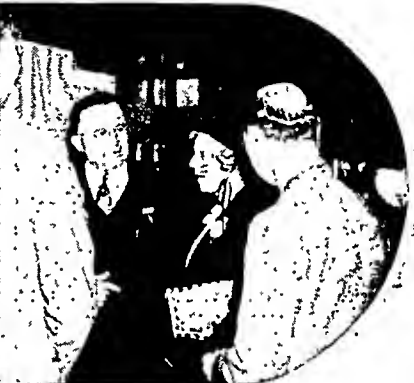
ELI LILLY AND COMPANY

Eli Lilly, who pioneered the large-scale manufacture of insulin for the treatment of diabetes and of liver extract for the treatment of pernicious anemia, will dis-

LIST OF EXHIBITORS

Pet Milk Co. St. Louis
Petrolagar Labs., Inc.
Philadelphia Hosp.
Phillip Morris & Co.
Phillips-Triester
Piller
Pilling
Prior Co., Inc., W. F.
Prometheus Electric Corp.
Puritan Compressed Gas Corp.
Pyramid Rubber Co.
Radium Chemical Co., Inc.
Radium Emulation Corp.
Riedel-de Haen, Inc.
Rose Mfg. Co., Inc., E. J.
Royal Metal Mfg. Co.
S. M. A. Corp.

Safety Gas Machine Co., Inc.
Saaborn Co.
Saandoz Chemical Works, Inc.
Saunders Co., W. B.
Sealan-Morris Co.
Schering Corp.
Scientific Sugars Co.
Searlight Co., Inc.
Searle & Co., G. D.
Selby Shoe Co.
Shampaine Aseptic Steel Furniture Co.
Sharp & Dohme
Slebrandt Mfg. Co., J. R.
Sklar Mfg. Co., J.
Smith-Dorsey Co.
Smith Co., Upsher
Smith, Kilne & French Labs.
Smith & Nephew, Inc.



CALCO CHEMICAL CO., INC.

Urginin ar...
be featured
of Urginin a
fibrillation,
myocardial
vascular-renal disorders; and of Trichloroethylene in the treatment of painful conditions about the face and in certain types of cardiac pain, will be discussed. Other Council-Accepted specialties will also be on exhibit.

CHAPPEL LABORATORIES

An invitation is extended to all members of the medical profession to visit the technical exhibit of Council-Accepted, anti-anemia preparations made by Chappel. The development of Chappel pharmaceuticals has progressed as a result of scientific and clinical research, and representatives will attempt to demonstrate some of the aspects of these investigations in their Booth, No. 93.

CHURCH & DWIGHT CO., INC.

As makers of those two dependable old products, Arm and Hammer and Cow Brand Baking Soda since 1846, Church and Dwight are happy to invite you to visit their exhibit in Booth 76. Here attendants will be glad to discuss with you the many uses of Bicarbonate of Soda in medicine and tell you how quantity production and wide distribution have made this product available at low cost.



CIBA PHARMACEUTICAL PROD., INC.

Physicians are cordially invited to visit the Ciba Booth, No. 205, where the Assistant Medical Director and representatives of the firm will be glad to answer ques-

Pharmacy and Chemistry, will be presented. In addition, the advantages of the Pulvoids method of manufacture as compared to mass made tablets will be shown.

E. FOUGERA & COMPANY, INC.

How Lipiodol (Lafay), the original iodized oil, not only meets all the requirements for a nontoxic, nonirritating, radiopaque contrast medium for visualization of body cavities and tissue spaces, but presents unique advantages for this purpose, will be shown and discussed at the Fougere exhibit in Booth 145.

HOSPITAL LIQUIDS, INC.

Intravenous Solutions in Filtrair Dispensers will be exhibited at the Hospital Liquids display; Booth 169. Physicians will find interesting the manner in which solutions are kept pyrogen-protected and how they can be depended upon for sterility, security and safety in administration. Competent representatives will be on hand to discuss problems of parenteral therapy.



HYNSON, WESTCOTT & DUNNING

An exhibit featuring Mercurochrome and various pharmaceutical specialties of H. W. & D. manufacture will be found in Booth 177. There will also be a display of diagnostic apparatus and ampule solutions which have been developed in the firm's laboratories in cooperation with physicians. Competent representatives will be in attendance to demonstrate the products and to answer questions.

INTERNATIONAL VITAMIN CORP.

Complete information on all matters pertaining to vitamins will be available for physicians at Booth 267. Included will be

play these products in their exhibit, Booths 212, 213 and 214. Important drugs such as Sodium Amytal, Ephedrine, Carbarsone, and a representative list of biologicals will be included. Also an interesting laboratory demonstration of the physiological effects of the female sex hormones Estrone and Estril will be presented.

MALLINCKRODT CHEMICAL WORKS

Physicians, their wives, and friends are invited to visit the Mallinckrodt Chemical exhibit, Space 170, where representatives will be glad to be of service in discussing any of the Mallinckrodt medicinal chemicals and specialties, such as ether, barium sulfate, Iodoquin, Isoiodoquin, Hippuran, the arsenicals, mandelates, sulfanilamide and soda lime.

MALTINE COMPANY

The various steps in the manufacture of Maltine with Cod Liver Oil, the result of more than six decades of continuous research and experience, will be shown in the Maltine exhibit, Booth 10. There will be shown illuminated slides, including photographs indicating the minuteness and uniformity of the oil globules after the oil has been incorporated by vacuum process.



McKESSON & ROBBINS, INC.

McKesson drug products approved by the A. M. A. will be featured in Space 110, together with an educational exhibit in pictures of the work carried on at the company's research laboratories and manufacturing plant at Bridgeport, Conn. Dr. A. L. Omohundro, director of laboratory research, will be in charge of the company's exhibit and will be assisted by members of the laboratory staff.

MC NEIL LABORATORIES

In Booth 291 representatives of McNeil Labs. will exhibit and discuss such important contributions as Digitalis Duo-Test, which is assayed by both the frog and guinea-pig method; Rosebud Vaginal Tampons, the soft, cup-shaped tampons which help to prolong vaginal medication; Lubricant "McNeil," a velvety smooth jelly for digital and instrumental examination; Emulsion Castor Oil, a palatable, stable emulsion containing 50% (by volume) medicinally pure castor oil.

MERCK & COMPANY INC.

The Merck exhibit will feature such outstanding discoveries of the past few years as Thiamin Chloride and Nicotinic Acid. In the center panel of the display will be a striking enlarged illuminated photograph of the crystals of vitamin B₁ hydrochloride. Below, the intricacies of the vitamin B complex will be graphically illustrated. Nicotinic Acid and Thiamin Chloride will occupy large panels left and right of the center. Booths 271 and 272.

WM. S. MERRELL COMPANY

An interesting series of dioramas will show methods of procuring raw materials for use in Merrell pharmaceutical products. Diothane Hydrochloride, Fluoreon, and other Merrell therapeutic agents will be on display, and representatives will explain their action and use. Booth 22.

Salysal, "Rare Chemicals," the salicylic ester of salicylic acid designed to provide improved salicylate therapy by reducing local gastric irritation to a minimum; and Optoclin Hydrochloride, ethylhydrocupreline, for pneumococcal infections of the eye.

RIEDEL-DE HAEN, INC.

At Booth 21 the Riedel-de Haen exhibit will feature Decholin and Decholin Sodium for the treatment of hepatic and biliary tract disorders. It will also present the scientific background of deoxycholic acid, the fat-digestant component of bile used to promote absorption of vitamin K.

SANDOZ CHEMICAL WORKS, INC.

Among the Council-Accepted pharmaceuticals of Sandoz in Booths 195 and 196, special attention will be given to Gynergen (ergotamine tartrate) extensively employed for the dramatic relief of migraine as well as for dependable uterine hemostasis; the gluconate preparation of calcium (Calciglucon) whose advantages for oral, intramuscular and intravenous calcium therapy were first discovered in the Sandoz Research Laboratories; Scillaren and Scillaren-II, dependable cardiotonics; and Sandophol, an excellent hypnotic.

G. D. SEARLE & COMPANY

A shadowgraph demonstration of various heart conditions will be on exhibition at the Searle Booth, No. 187. This ingenious device, developed by Dr. George Levene of Boston, enables the physician to view in

samples also available on tincture, capsules and tablets *Digitalis Upsher Smith* of U.S.P. XI potency. A cordial welcome to all visiting physicians.

E. R. SQUIBB & SONS

A new display featuring recent additions to the Squibb line of Council-Accepted and pharmaceuticals and at Booths 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

FREDERICK STEARNS & COMPANY

Doctors are cordially invited to visit the attractive Stearns Booth, No. 176, to view and discuss outstanding contributions to medical science developed in the firm's Scientific Laboratories. Representatives will be pleased to supply information on such outstanding products as Neo-Synephrin Hydrochloride. Information on Appella Apple Powder-Stearns for use in infantile diarrhea and dysenteries will be readily available.

WHITE LABORATORIES

Representatives of White Labs., Booth 210, will concentrate on furnishing practical information, backed by tests of time, as well as animal and clinical experience. These representatives will present Council-Accepted White's Cod Liver Oil Concentrate (liquid, tablets and capsules), together with pertinent information.

LIST OF EXHIBITORS

Snuggle Rug Co., Goshen, Ind.
Sonotono Corp., Elmstord, N. Y.
Sorenson Co., Inc., C. M., Long Island City
Spencer Corset Co., Inc., New Haven, Conn.
Spencer Lens Co., Buffalo
Squibb & Sons, E. R., New York City
Standard X-Ray Co., Chicago
Stearns & Co., Fred., Detroit
Stokely Brothers
Storz Instrument
Surgical Publisher
Tampax, Incorporated, New York City
Taylor Instrument Cos., Rochester, N. Y.
Thomas, Charles C., Springfield, Ill.
Tower Co., Inc., Seattle, Wash.
U.M.A., Inc., New York City
Union Carbide Co., New York City
Union Mfg. Co., Memphis, Tenn.

Universal Cotton Products Corp., Minneapolis
Univ. Presses, Books of, Chicago
Vegex, Inc. and Vitamin Food Co., Inc., N. Y. C.
Vlex Laboratories, N. J.
Walk-Over Shoe, Mass.
Wallace & Tierua, N. J.
Welch Allyn Co., Auburn, N. Y.
Westinghouse X-Ray Co., Inc., Long Island City
White Laboratories, Inc., Newark, N. J.
Williams & Will
Wilson Rubber
Winthrop Chem.,
Wisc. Alum. R.
Wocher & Son
Wright & Co. Inc., E. T., Rockland, Mass.
Wyeth & B.
Zelss, Inc.,
Zimmer Mfg. Co.,

**PARKE, DAVIS & COMPANY**

Members of the staff of Parke, Davis will be at your service to tell you about some of the numerous scientific products of Parke, Davis, Adrenalin, Theelin, Theelin, Theelin, and other biological products will be a part of this attractive exhibit. Booths 79, 80 and 81.

E. L. PATCH COMPANY

While many vitamin products have come and gone during recent years, there has recently been a decided trend back to Cod Liver Oil as a source of natural vitamins A and D. Patch's Cod Liver Oil will be featured at the Patch Company exhibit, Space 77. Patch representatives will be on hand to greet their friends in the medical profession and discuss the advantages of Cod Liver Oil as a source of the natural vitamins A and D.

PETROLAGAR LABORATORIES, INC.

At an interesting Petrolagar exhibit, Booth 121, representatives will be pleased to discuss the various uses of the product for the treatment of constipation. When you stop in to chat with one of the Petrolagar representatives, ask him to show you the new list of scientific motion pictures. There are numerous subjects especially suitable for classroom or lecture purposes.

PURITAN COMPRESSED GAS CORP.

The "Puritan Maid" brand of nitrous oxide, ethylene, oxygen, carbon dioxide, and carbon dioxide-oxygen mixtures, will be included in the exhibit of Puritan Compressed Gas Corp., Booth 108. Mr. George J. Hooper will be in charge of the exhibit and other authorized representatives will be in attendance.

RARE CHEMICALS, INC.

At Booth 161 Rare Chemicals will feature Gitalin (Amorphous), a rapid, dependable, glucosidal fraction of digitalis purpurea;

motion many of the typical pathologic alterations in cardiac contour and rhythm. A number of Searle representatives will be present and you are cordially invited to discuss with them various preparations.

SHARP & DOHME, INC.

Their complete line of Propadex Hydrochloride products will be featured this year by Sharp & Dohme. In addition, there will be on display other items of interest in both the medical and biological field. All representatives of this Convention are invited to visit at Booths 193 and 194. Competent, well-informed representatives will be on hand to furnish information.

SMITH-DORSEY COMPANY

Physicians are cordially invited to visit the Smith-Dorsey Booth, No. 295, where they will find on display a number of products which meet the requirements of the Council on Pharmacy and Chemistry. Representatives in charge of the exhibit will be glad to furnish full information about products shown.

SMITH, KLINE & FRENCH LABS.

Physicians are invited to stop at Booth 155 to obtain complimentary samples of Benzadrine Inhaler. Representatives will be glad to answer questions about Benzadrine Sulfate Tablets, Benzadrine Solution and Pentnucleotide. Physicians may help themselves from convenient literature dispensers without the bother of leaving their names. They will not be solicited to register.

UPSHER SMITH COMPANY

Booth 158, Aisle G, between registration tables and main entrance, will feature Pyrethrum Ointment, Council-Accepted non-irritating scabies treatment, which has a pleasant odor and is clean and easy for your patients to use. Information and

WINTHROP CHEMICAL CO., INC.

is extended by Booth 95, where they discuss the latest preparations made available by this firm. You will receive valuable booklets dealing with anesthetics, analgesics, antiremittents, antispasmodics, antisyphilitics, diagnostics, diuretics, hypnotics, sedatives and vasodilators.

JOHN WYETH & BROTHER, INC.

In Booth 230, Denn Cornwell's heroic canvas, "Beaumont and St. Martin" will be exhibited by John Wyeth & Brother. This is the first showing of this painting at an American Medical Association Convention and is the first painting in a series to be presented by Wyeths. The series is entitled "Pioneers in American Medicine" and will dramatize the contributions of Americans to the advancement of medicine. Arrangements for reproductions of the painting may be made at the booth.

PHYSICAL THERAPY AND X-RAY**AOLANCO X-RAY CORPORATION**

In Booth 27 the Aolanco X-Ray exhibit will feature the Siemens Planigraph, which permits fluoroscopy and radiography of the predetermined layer within the patient's body without anterior and posterior obstructions. The "Original Ultratherm" ultra short wave apparatus, as well as the smallest shock-and-ray-proof X-ray unit "Teliosphere," will also be exhibited. A call to inspect these new and important contributions will be well worth while.

(Continued on advertising page 81)

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Society News.—Dr. Sumner L. S. Koch, Chicago, discussed "Surgical Management of Fractures, Lacerations and Infections of the Hand" before the Los Angeles Surgical Society March 24. Among others, Dr. Wilbur Bailey addressed the Trudeau Society in Los Angeles March 28 on "Spontaneous Pneumothorax of Nontuberculous Origin."

Changes in Health Officers.—The *Weekly Bulletin* of the California Department of Public Health recently announced the following changes in health officers:

Dr. Albert B. Gray, Dorris, succeeding Dr. Paul F. Dieffenbacher.
Dr. David G. Schmidt, Larkspur, succeeding Dr. Cornwall C. Everman.
Dr. James D. Coulter, Portola, of Plumas County.
Dr. Harry M. Grayman of Dos Palos to succeed Dr. Edwin A. Patterson.
Dr. James L. Faulkner, Red Bluff, of Tehama County, succeeding Dr. Otto T. Wood.
Dr. William E. Fountain, Merced, of Merced County, succeeding Dr. Clarence C. Fitzgibbon.

Dr. Reuben L. Kaufman, who has served for many years as district health officer at Whittier, under the Los Angeles County Health Department, has been appointed health officer of Riverside County to succeed the late Dr. Wendall A. Jones.

COLORADO

Society News.—At a special meeting Dec. 28, 1938, the Colorado Hospital Association adopted new by-laws to make the structure of the state association conform more closely to those of the American Hospital Association.

Personal.—Dr. Thaddeus M. Koppa, Cheyenne, Wyo., has been appointed in charge of the Otero County health unit, pending the return of Dr. Lynn J. Lull, Branford, Conn., who is taking a year's graduate study at Yale University.

DELAWARE

Society News.—The Delaware Academy of Medicine, Wilmington, was addressed March 3 by Dr. Robert B. Osgood, Boston, on "The Ethics of Medicine."—Dr. Amos R. Koontz, Baltimore, addressed the New Castle County Medical Society, Wilmington, recently on "The Use of Fascia in Surgery."

Delaware Society to Observe Sesquicentennial.—Plans are under way to observe in October the sesquicentennial of the Medical Society of Delaware. The organization was incorporated by a special act of the legislature Feb. 3, 1789, thus making it the third oldest medical society and the second oldest medical corporation in the United States, according to the state medical journal. New Jersey holds first place in both categories, with Massachusetts in second place as a society. The celebration will be held in Wilmington.

ILLINOIS

Personal.—Dr. Louis J. Frederick has been appointed health commissioner of Joliet, succeeding the late Dr. Edward J. Higgins.

Chicago

Necropsy Rate in Research Hospital.—A delayed report from the Research and Educational Hospital of the University of Illinois, Chicago, indicates that this institution has a record of 83.2 per cent necropsies for the year 1938. Other approved internship hospitals having over 70 per cent necropsies were reported on page 924 of the Hospital Number of THE JOURNAL March 11.

Public Session on the Hard of Hearing.—The Chicago Medical Society will hold a public meeting on "What Chicago Does for Its Hard of Hearing" at the Chicago Woman's Club April 19. The principal speakers will include Frank L. Beals, assistant superintendent, Chicago schools; Dr. Robert Black, acting president, board of health; Dr. Walter H. Theobald, secretary, Chicago Laryngological and Otolological Society; Dr. Samuel Salinger, clinical professor of otorhinolaryngology, Loyola University School of Medicine; Miss Irene Hubbell, president, and Dr. Austin A. Hayden, chairman, board of directors of the Chicago League for the Hard of Hearing, and Edward J. Kelly, mayor.

Society News.—Among others, Drs. Arthur K. Koff and Edith L. Potter addressed the Chicago Gynecological Society March 17 on "Dangers of Excessive Development of Human Fetus."—The Chicago Society of Allergy was addressed March 20 by Dr. Israel Davidsohn on "Heterophilic Phenomena in Immunology."—Dr. Isadore Pilot addressed the Chicago Club for the Study of Rheumatic Diseases March 22 on "Different Features of Bacterial and Rheumatic Arthritis," and Drs. Catharine E. Logan and Eugene F. Traut, Oak Park, Ill., "Clinical and Bacteriologic Improvement in Chronic Arthritis Following the Use of Sulfanilamide."—A symposium on commitment to mental hospitals was presented before the Illinois Psychiatric Society March 2 by Drs. Francis J. Gerty, Thomas M. French and Abraham A. Low.

INDIANA

Director of Research on Sickness Insurance.—Dr. Walter U. Kennedy, Newcastle, has been appointed director of research on sickness insurance of the Indiana State Medical Association. The position is a new one. Dr. Kennedy graduated at Barnes Medical College, St. Louis, in 1898.

Marriage Law Now in Effect.—A law has been enacted in Indiana governing applicants for licenses to marry. Applicants must submit to tests for venereal diseases. Application for a license must be made in the home county of the bride or in the home county of the bridegroom if the bride does not reside in Indiana; if neither is a resident of the state a license will be refused. Notice of intention to marry must be publicly certified five days before the ceremony.

Semiannual District Meeting at Peru.—The sixty-first semiannual meeting of the Eleventh Indiana Councilor District Medical Association will be held at Peru May 10. A clinic on renal diseases, conducted by Dr. Howard M. Odel, Rochester, Minn., will open the session. The speakers in the afternoon will include Drs. Herbert M. Rhorer, Kokomo, who will give the presidential address; Ernest O. Asher, New Augusta (subject not announced); Ora G. Brubaker, North Manchester, "The Acute Ear," and Dr. Odel, "Essential Hypertension—Diagnosis and Management." Andrew W. Cordier, Ph.D., Manchester College, North Manchester, will give an address at the banquet, under the auspices of the Miami County Medical Society, on "Germany and Her Neighbors."

KANSAS

The Wichita Medical Supplement.—The *Wichita Sunday Beacon* dedicated an eight page section March 19 to the "men of medicine of Wichita." Carrying a caption "A Dedication and Tribute to the 'Regular' Family Doctor," the first page shows a reprint of the painting "The Doctor" by Fildes. Articles describe the activities of the Sedgwick County Medical Society and its auxiliary. There are also discussions of diseases and of hygiene. The *Eagle* and the *Beacon*, in separate supplements, have thus honored the local profession for the past five years.

MAINE

Society News.—The Cumberland County Medical Association was addressed in Portland recently by Dr. Roger I. Lee, Boston, among others, on "The Doctor's Dilemma, When and If the Government Goes Into the Practice of Medicine in a Big Way."—At a meeting of the Portland Medical Club recently Dr. Edward A. Greco discussed "The Heart in Lung Diseases."—The Kennebec County Medical Association held a clinical session in Waterville February 16; the speakers included Drs. Edward H. Risley on "Ruptured Gallbladder and Incarcerated Inguinal Hernia" and Edwin R. Irgens, "Plastic Operation for Deformity of Face Secondary to Operation for Carcinoma of Antrum."—Dr. Everett D. Kiefer, Boston, discussed "Management of Ulcerative Colitis and Functional Colonic Disorders" before the Knox County Medical Society in Rockland February 14.—Dr. Siegfried J. Thannhauser, Boston, addressed the Oxford and Penobscot county medical societies in Rumford and Bangor respectively on diseases of the liver.—Dr. Adam P. Leighton, Portland, addressed the Maine Pharmaceutical Association recently in Augusta on "The Relationship of the Doctor to the Druggist."

MARYLAND

Buildings for Tuberculous Patients.—Buildings to house 200 additional patients are under construction from funds provided by the state legislature, according to the *Baltimore Health News*. These beds are expected to be ready for occupancy October 1. A request is to be made of the legislature

by the board of managers of the state tuberculosis sanatorium commission for funds for an additional hundred beds at Henry-ton, a sanatorium for Negroes, and for funds to establish a branch hospital for Negro patients on the Eastern shore. It is also hoped to have a building in operation October 1 for the sole purpose of surgical treatment of tuberculosis of the lungs.

Annual Meeting of Medical and Chirurgical Faculty.—Dr. Victor F. Cullen, acting president, will open the annual meeting of the Medical and Chirurgical Faculty of Maryland in Baltimore April 25 with an address on "Tuberculosis of the Past and Present." Trimble lectures will be given by Drs. John Alexander, Ann Arbor, Mich., and Haven Emerson, New York, on "Management of Bronchiectasis and Abscess of the Lung" and "Administrative Medicine" respectively. Dr. Wilcy D. Forbus, Durham, N. C., will deliver the first Stokes lecture on "Variations in Morphological Reaction to Injury." There will be a symposium on appendicitis by Drs. Victor D. Miller and Arthur M. Shipley, and a round table luncheon with the following speakers:

- Dr. Thomas B. Aycock, Surgery of the Chest.
- Dr. Bartus T. Baggett, Early Diagnosis of Tuberculosis.
- Dr. Thomas R. Chambers, Rectal Surgery.
- Dr. Richard G. Coblentz, Cerebral Trauma.
- Dr. John A. Campbell Colston, Urology.
- Dr. Ira A. Darling, Sykeville, The Responsibility of a State Mental Hospital to the Community.
- Dr. Nicholson J. Eastman, Obstetric Hemorrhage.
- Dr. John S. Fenby, Common Problems in Pediatrics.
- Dr. Whitmer B. Firor, Radiation Therapy of Inflammatory Conditions.
- Dr. Francis J. Geraghty, The Treatment of Pneumonia with Sulfapyridine.
- Dr. Charles Loring Joslin, The Treatment of Pneumonia in Infants and Children with Sulfapyridine.
- Dr. John Mason Hurdley Jr., Malignancy of the Female Generative Tract.
- Dr. Raymond Hunsley, Relationship of Heart Disease to Pulmonary Disease.
- Dr. Edward A. Looper, Remarks on Diseases of the Accessory Sinuses.
- Dr. Llewellyn Williams Lord, Ezenia.
- Dr. Joseph E. Moore, Legislation Regarding Syphilis.
- Dr. Moses Paulson, Practical Aspects of the Diarrheas and Dysenteries of the Adult.
- Dr. Floyd Elmer Shaffer, Sparrows Point, Accident Surgery.
- Dr. Richard W. TeLinde, Office Gynecology.
- Dr. Allen F. Voshell, Proximal Fractures.
- Dr. Frank B. Walsh, Ophthalmology.

MASSACHUSETTS

George Bigelow Memorial.—The Boston Medical Library has received \$1,038.30 to provide a permanent fund, the income of which will be used to purchase books on public health, cancer, medical economics and related subjects to serve as a memorial to the late Dr. George H. Bigelow. A section in Holmes Hall has been set apart for these books. The books are to be selected by a committee composed of the librarian of the Boston Medical Library, the dean of the Harvard School of Public Health and the commissioner of public health. As a nucleus for the collection, the Commonwealth Fund of New York has contributed fourteen volumes of its publications and a few writers on public health have donated copies of their books. It is hoped that additional gifts of books or money for the Bigelow Library will be made from time to time and sent to the librarian of the Boston Medical Library. According to the *New England Journal of Medicine*, two friends of Dr. Bigelow who prefer to be anonymous have presented to the library a bookplate, designed by Miss Mary Sears, to be placed in each book purchased by the fund. Each donor has received a print of the bookplate, which carries an excellent likeness of Dr. Bigelow. The fund was collected by a memorial committee, members of which were Drs. Henry D. Chadwick, Boston, chairman; Dr. Clarence L. Scamman, New York; Dr. Charles F. Wilinsky, Boston; Frank Kiernan, A.B., New York; Dr. Gaylord W. Anderson, Minneapolis; Dr. Walter P. Bowers, Clinton; Ida M. Cannon, R.N., and Curtis M. Hilliard, A.B., Boston; Dr. Benjamin Harrison Ragle, Boston; Dr. Wilson G. Smillie, New York, and Mr. Horace Morison.

MICHIGAN

Consultant on Maternal Health.—Dr. Alexander M. Campbell, Grand Rapids, has been appointed full time consultant to the bureau of maternal and child health of the state department of health. He will carry on a program jointly sponsored by the state medical society, the W. K. Kellogg Foundation, the University of Michigan and the state department of health, working with the maternal health committees of the county medical societies in the state, newspapers reported February 12.

New Maternity Service.—A new health service providing medical, nursing and hospital care for expectant mothers who otherwise would not be able to secure such care was to be started in Schoolcraft County March 15. Organized by the state department of health with social security funds, the service is under the immediate supervision of Dr. Ervin J. Brenner, director of the Alger-Schoolcraft Health Department in cooperation with the local physicians. Funds will be provided to pay physicians for complete obstetric service, including antepartum and postpartum care. Hospital care will be available when needed and the family physicians will be given nursing assistance for both home and hospital deliveries. Physicians wishing to use this service should submit their applications to Dr. Brenner's office in Manistique.

Meeting of Industrial Physicians.—The Michigan Society of Industrial Physicians and Surgeons will hold its annual meeting at the Hotel Olds, Lansing, April 19. The speakers will include:

- L. J. Carey, LL.B., Detroit, general counsel, Michigan Mutual Liability Insurance Company, Medical Service for the Small Employer.
- Dr. Gordon B. Myers, Detroit, professor of medicine, Wayne University College of Medicine, Sulfanilamide in Surgical Infections.
- Dr. William L. Benedict, professor of ophthalmology, University of Minnesota Graduate School of Medicine, Rochester, Preventable Industrial Eye Accidents.
- Dr. Frank T. McCormick, Detroit, Medical Relations in Industrial Surgery.

Warnings and precautions in management against disabling results from injuries will be given by the following: Drs. Alfred H. Whittaker, injuries to hips; Grover C. Penberthy, Detroit, elbows; Carl E. Badgley, Ann Arbor, backs; Max M. Peet, Ann Arbor, skulls.

NEVADA

Annual Registration Due May 1.—All persons holding licenses to practice medicine in Nevada are required by law to pay annually to the treasurer of the Board of Medical Examiners, on or before May 1, a tax of \$2. Failure to do so operates to forfeit a licensee's right to practice medicine and his license to practice can be reinstated thereafter only on the payment of a \$10 penalty.

NEW MEXICO

Biennial Report of State Health Department.—The biennial report of the state department of public health for 1937 and 1938 indicates that the department has been enlarged by a division of health education, a school health consultant and a milk sanitarian. With funds provided by the Children's Bureau of the U. S. Department of Labor, a demonstration unit has been established in San Miguel County as a training field for public health nurses. Sixteen nurses have been added to the department's staff during the biennium, bringing the total number to seventy-four. Influenza was the most prevalent communicable disease in 1937 and measles in 1938; measles came second in 1937 and syphilis in 1938; 130 fewer cases of typhoid were reported in 1938 than the average for the five preceding years. Tuberculosis is one of New Mexico's major problems. In 1937 there were 1,392 cases reported of which 542 originated outside the state. The state's infant death rate, highest in the United States, is chiefly caused by diarrhea and enteritis. A dysentery research project, which has been in progress for several years, continues to operate. Through the U. S. Public Health Service the state has initiated a venereal disease control project in Bernalillo County. The engineering division in cooperation with the University of New Mexico made a survey of fluorine in public water supplies. Samples from 359 supplies were examined. Of 157 communities of considerable size, thirty-five were found to have water containing fluorine above the danger point of 0.9 parts per million. In the division of maternal and child health, established in 1936 under the provisions of the Social Security Act, the largest part of the funds have been used to increase the number of public health nurses working in rural areas. Maternity and child health clinics are conducted by physicians who are members of the state medical society. Since 1937, 900 of these clinics have been conducted, most of them by local staff to instruct midwives, of whom there are about 800 in the state. The state laboratory has moved into a new building. In 1937 the laboratory examined 60,220 specimens and in addition performed 50,657 agglutination tests for Bang's disease in cooperation with the U. S. Bureau of Animal Industry. In 1938, 72,563 specimens were examined and 39,694 agglutination tests were performed. Tests for syphilis were made on 22,596 specimens in 1937 and 26,784 in 1938.

NEW YORK

Society News.—The New York State Association of Public Health Laboratories will hold its twenty-third annual meeting at Grasslands Hospital, Valhalla, May 8.—Dr. John E. Jennings, Brooklyn, addressed the Medical Society of the County of Nassau at Garden City March 28 on "Management of Carcinoma of the Colon."—Drs. Enrico C. Soldini, Staten Island, and Nathan Rosenthal, New York, addressed the Richmond County Medical Society in February at St. George on "Management of the Diabetic Patient" and "Diseases of the Blood" respectively.—Dr. Charles Gordon Heyd, New York, addressed the Medical Society of the County of Albany March 22 on "Diagnosis and Treatment of Cancer of the Colon and Rectum."

Alumni Clinical Day in Buffalo.—Alumni of the University of Buffalo School of Medicine will have their annual clinical day April 22 at the Hotel Statler, Buffalo. The speakers will be:

Dr. Elmore B. Tauber, professor of dermatology and syphilology, University of Cincinnati College of Medicine, Cincinnati.

Dr. Horton Casparis, professor of pediatrics, Vanderbilt University School of Medicine, Nashville, Tenn.

Dr. Edward H. Dennen, professor of gynecology and obstetrics, New York Polyclinic Medical School and Hospital, New York.

Dr. Harry E. Mock, associate professor of surgery, Northwestern University Medical School, Chicago.

Dr. Ernest Perry McCullagh, director of the department of endocrinology and metabolism, Cleveland Clinic, Cleveland.

David L. Thomson, Ph.D., professor of biochemistry, McGill University Faculty of Medicine, Montreal, Que.

The annual dinner will be held at the Statler.

New York City

Biggs Memorial Lecture.—Mr. Frederick Osborn, research associate in anthropology at the American Museum of Natural History, delivered the fourteenth Hermann Michael Biggs Lecture of the New York Academy of Medicine, April 6, on "Significance to Medicine of Present Population Trends."

Seventh Harvey Lecture.—Charles H. Danforth, Ph.D., professor of anatomy, Stanford University School of Medicine, San Francisco, will deliver the seventh Harvey Society Lecture of the current series at the New York Academy of Medicine April 20. Dr. Danforth will speak on "Genic and Hormonal Factors in Some Biological Processes."

Dinner to Eve Curie.—The New York City Cancer Committee of the American Society for the Control of Cancer will sponsor a dinner in honor of Mlle. Eve Curie, daughter of Pierre Curie and Madame Curie, discoverers of radium, Tuesday April 18. The dinner will be at the Cosmopolitan Club, 129 East Sixty-Fifth Street. Mlle. Curie is the author of the recent biography of her mother.

Friday Afternoon Lectures in Brooklyn.—The spring series of Friday afternoon lectures sponsored by the Medical Society of the County of Kings included the following lectures:

Dr. James Alexander Miller, Modern Approach to the Early Diagnosis of Pulmonary Tuberculosis, March 17.

Dr. Joseph E. Milgram, Subdeltoid Bursitis—Its Pathology, Differential Diagnosis and Office Treatment, March 24.

Dr. Theodore J. Curphey, New Contributions to Laboratory Medicine—Their Clinical Interpretations and Significance, March 31.

Dr. Harry M. Greenwald, Diagnostic and Therapeutic Aspects of Splenic Enlargement, April 14.

Large Chronic Disease Hospital Completed.—Construction has been completed at the new Hospital for Chronic Diseases on Welfare Island and the hospital will be opened about July 1, it was announced February 4, when a group of 1,500 physicians, nurses and social workers inspected the new institution. The hospital has four four-story ward buildings, with a seven story administration building in the center. The bed capacity of the hospital will be 1,600, and the building has cost almost \$8,000,000. When it is opened 800 patients will be brought from other city institutions, thus relieving overcrowded buildings originally intended for acutely ill patients.

Society News.—A symposium on mental health problems was presented at a meeting of the Medical Society of the County of New York March 27 by Drs. Gerald R. Jameison, Severo Eugene Barrera, Karl M. Bowman and Lawrence S. Kubie.—The program of the Medical Society of the County of Kings March 21 included as speakers: Drs. Joseph Slavitt, on "Socialized Medicine"; Kingsley Roberts, "Group Practice and Its Relationship to the Future of American Medicine"; Charles Gordon Heyd, "Medical Expense Indemnity Insurance," and Haven Emerson, "The National Health Program."—Drs. Burrill B. Crohn and Richard Lewisohn addressed the Bronx County Medical Society March 15 on medical and sur-

gical aspects, respectively, of ulcer of the stomach and duodenum.—Dr. James A. Cahill Jr., Washington, D. C., addressed the Queensboro Surgical Society April 19 on "Trauma of the Abdomen and Chest."

Industrial Workers Tested for Tuberculosis.—The New York City Department of Health with the assistance of the Works Progress Administration is conducting tests among the 15,000 fur workers in New York to determine the prevalence of tuberculosis in this occupation. When the program among the fur workers is completed it is hoped that other occupational groups may be examined. Although this is the beginning of the tuberculosis service among industrial workers, the health department has examined more than 160,000 in its tuberculosis program among other groups, begun in December 1933. The tests have been given to 5,000 residents of or transients at the Municipal Lodging House, 14,000 high school children, 8,857 members of the National Youth Administration, 2,500 residents of West New Brighton, Staten Island, 4,000 men in the Rikers Island Penitentiary, 1,000 women in the Women's House of Detention, 1,000 Hunter College students, 1,000 students of the College of the City of New York and 600 of New York University. The percentage of infection among these groups runs from 0.5 per cent to 16 per cent. The highest percentage was found among the transients and homeless men of the Municipal Lodging House.

NORTH CAROLINA

Duke Celebrates Centennial.—Duke University announces a formal celebration of its centennial April 21-23. The entire scholastic year 1938-1939 was designated as a time for celebration of the century of development that has resulted in the Duke University of today. The university is built around Trinity College, which goes back to 1838-1839, when a group of Methodists and Quakers established a school they called Union Institute. The school kept this name until 1851, when it became a teachers' college and was called Normal College. Just before the Civil War the college was affiliated with the North Carolina Methodist Conference and named Trinity College, which continues today as the undergraduate college for men in the university. Duke was organized in 1924. In November 1938, the university presented a three day symposium on medical problems as part of the centennial observance (THE JOURNAL, Oct. 8, 1938, page 1389). At the coming ceremonies there will be discussions of "Southern Contributions to American Education," "Education and the Public" and "The University and the Nation."

OHIO

Personal.—Dr. Emily J. Widdecombe, Kent, for many years secretary of the Portage County Medical Society, was recently honored for her service. The society presented her a gold and amethyst bracelet.—Dr. Clyde W. Dawson, Columbus, has been appointed orthopedist in the medical section of the state industrial commission.—Dr. Edward S. Folk has recently been elected mayor of Canton.

Postgraduate Assembly at Youngstown.—The Mahoning County Medical Society will present its twelfth Annual Postgraduate Assembly in Youngstown April 20 with a group from the University of Pennsylvania School of Medicine, Philadelphia, as its guests. The following program is announced:

Dr. Charles C. Wolferth, Cardinal Features of Coronary Disease; Physical Examination of the Heart with Special Reference to Heart Sounds.

Dr. Eugene P. Pendergrass, Silicosis and Silicosis with Infection; Roentgen Therapy of Infections.

Dr. Richard A. Kern, General Principles of Allergy and Clinical Manifestations of Allergy (Part 1); Clinical Manifestations of Allergy and Principles of Diagnosis and Treatment (Part 2).

Dr. Joseph Stokes Jr., Recent Advances in the Study and Treatment of Certain Virus Diseases; Prophylaxis and Treatment in Certain Acute Infectious Diseases.

PENNSYLVANIA

Society News.—Dr. William Devitt, Allenwood, was elected president of the Pennsylvania Tuberculosis Society for the fifth time at its annual meeting in Pittsburgh February 14-15. Dr. Charles Howard Marcy, Pittsburgh, was elected secretary.

Philadelphia

Joint Obstetric Meeting.—The Obstetrical Society of Philadelphia entertained the New York Obstetrical Society, Obstetrical Society of Boston, the Pittsburgh Obstetrical and Gynecological Society and the Washington Gynecological Society April 6. Clinics were held in various hospitals during

the day and the Philadelphia group gave a dinner in the evening at the University Club, at which Dr. Benjamin P. Watson, New York, presided.

Society News.—Speakers at a meeting of the Philadelphia Urological Society March 27 were Drs. Charles H. de T. Shivers and Kenneth P. Henderson, Atlantic City, N. J., on "Tumors of the Bladder; A Review of 101 Cases" and Clarence R. O'Crowley, Newark, N. J., "Polycystic Kidneys."—Dr. Howard H. Bradshaw, among others, addressed the Laennec Society of Philadelphia, March 28, on "Neurogenic Tumors of the Thorax."—Dr. John F. Fulton, Sterling professor of physiology, Yale University School of Medicine, New Haven, addressed the Jefferson Neurological Society, March 22, at Jefferson Medical College, on "Hypothalamus and Regulation of Autonomic Function."

SOUTH DAKOTA

State Medical Meeting at Aberdeen.—The fifty-eighth annual session of the South Dakota State Medical Association will be held in Aberdeen April 24-26 under the presidency of Dr. John F. D. Cook, Pierre. The following guest speakers are on the program:

Dr. Edward D. Allen, Chicago, Diagnosis and Treatment of Leukorrhea; Diagnosis and Treatment of Endometriosis.
Dr. Don C. Sutton, Chicago, Arteriosclerosis—Etiology, Symptoms and Treatment.
Dr. Hewitt B. Hannah, Minneapolis, An Analysis of Factors in Personality Influencing Health.
Dr. Henry W. Meyerding, Rochester, Minn., Backache.
Dr. Henry L. Williams Jr., Rochester, Minn., Physiologic Phenomena Which Are Misinterpreted as Nasal Disease.
Dr. Joseph C. Ohlmacher, Vermillion, Practical Cooperation Between the Practicing Physician and the Diagnostic Laboratory.
Dr. Clifford J. Barborka, Chicago, Recent Advances in Nutrition.
Dr. Edwin M. Miller, Chicago, Bowel Obstruction in the Newborn.
Dr. Harry Culver, Chicago, Epithelial Tumors of the Bladder.
Dr. Fay H. Squire, Chicago, Diagnosis and X-Ray Picture of Peptic Ulcer During Medical Management.
Dr. Gerald J. Van Heuvelen, Pierre, Venereal Disease Control.

There will be clinics by Drs. Meyerding, Sutton, Culver, Barborka, Squire and Miller. The South Dakota Academy of Ophthalmology and Otolaryngology will hold its meeting Tuesday April 25 with the following speakers: Drs. Henry L. Williams Jr., Rochester, Minn., "Effect of Radium in Maintaining Patency in the Nasofrontal Duct" and "External Operations on the Frontal Sinus"; Walter H. Fink, Minneapolis, "Routine Ocular Muscular Investigation"; Henry P. Rosenberger, Bismarck, N. D., "Suppurations in the Neck," and Edward A. Rudolph, Aberdeen, "Perforating Injuries of the Eye."

TENNESSEE

Personal.—Dr. Fray O. Pearson, Livingston, has been appointed health officer of Hamilton County to succeed Dr. Jesse C. Eldridge, Chattanooga, resigned.—Dr. J. W. Erwin, Blountville, has been appointed health officer of Sullivan County to succeed Dr. Fred L. Moore, Blountville, who resigned to join the faculty of Long Island College of Medicine, New York.

New Graduate Courses at Vanderbilt.—A new series of graduate courses at Vanderbilt University School of Medicine, Nashville, is to be made available to physicians under the auspices of the Commonwealth Fund of New York, according to the *Journal of the Tennessee State Medical Association*. Four courses of one month's duration will be given, medicine and surgery from June 15 through July 17 and pediatrics and obstetrics from July 17 through August 17.

Society News.—Dr. James B. Neil, Knoxville, addressed the Knox County Medical Society, Knoxville, March 7 on prostatic resection.—Dr. Douglas Chamberlain, Chattanooga, addressed the Chattanooga and Hamilton County Medical Society March 23 on "Ménière's Disease" and Dr. Gene H. Kistler, Chattanooga, March 16 on "Pruritus Ani."—Drs. Duane M. Carr and James S. Speed, Memphis, addressed the Madison County Medical Society, Jackson, March 7 on treatment of pulmonary tuberculosis and causes of low back pain respectively.

TEXAS

Hospital News.—Dr. Michael A. Cunningham, medical director of the Holy Cross Sanatorium, Holy Cross, N. M., has been appointed superintendent and medical director of the Jefferson County Tuberculosis Hospital, Beaumont. Mrs. Caroline Van Zandt, who has been superintendent for several years, will remain at the hospital in an administrative capacity.

District Meeting.—Guest speakers at a meeting of the Northwest Texas District Society at Mineral Wells, February 14, were Drs. Willis C. Campbell, Memphis, Tenn., on "Surgery of the Hip"; Tinsley R. Harrison, Nashville, Tenn., "The Value of Drugs in the Management of Cardiac Disease"; Stanley George Wolfe, Shreveport, La., "Diagnosis and Treatment of Undulant Fever"; Edward H. Schwab, Galveston, "Diagnosis of Coronary Occlusion," and Homer Prince, Houston, "Practical Points in Treating Infected Allergic Patients."

Society News.—At a meeting of the Dallas County Medical Society March 9 the speakers were Drs. Charles L. Martin on "Treatment of Sterility by Fallopian Tube Inflation with X-Ray Control"; John E. Ashby, "Drugs in the Treatment of Congenital Syphilis," and Tate Miller, "Colitis."—Drs. Louis F. Hamilton and Ira L. Howell addressed the El Paso County Medical Society, El Paso, February 13 on "Uterine Fibroids" and "Amnesia" respectively.—Drs. Neil D. Buie and Howard O. Smith, Marlin, addressed the Falls County Medical Society, Marlin, January 9 on "Bright's Disease" and "Cancer of the Breast" respectively.—Dr. Louis F. Knoepf, Beaumont, addressed the Jefferson County Medical Society, Beaumont, January 9 on "Presacral Neurectomy."

UTAH

Society News.—Dr. Orin A. Ogilvie, Salt Lake City, recently addressed the Weber County Medical Society on the diagnosis, prognosis and treatment of malignant tumors of the skin.

Personal.—Dr. George N. Curtis, Salt Lake City, has been appointed medical director and superintendent of the Salt Lake County General Hospital, Salt Lake City, to succeed Dr. Robert J. Alexander, according to *Modern Hospital*.

VIRGINIA

Professor Retires.—Dr. Halstead S. Hedges has resigned as professor of diseases of the eye at the University of Virginia Department of Medicine, Charlottesville, after thirty-four years in that position. Dr. Hedges graduated from the university medical department in 1889 and took his medical degree there in 1892. After several periods of study in New York he was appointed professor in 1905.

Regional Meeting.—A symposium on diseases of the chest was presented at a meeting of the Southside Virginia Medical Association in Franklin March 21. The speakers were Drs. John A. Proffitt, Burkeville, "Early Signs and Symptoms of Tuberculosis of the Chest"; Porter P. Vinson, Richmond, "Aids in the Early Diagnosis of Primary Carcinoma of the Bronchus"; Wright Clarkson, Petersburg, "The X-Ray in the Diagnosis of Diseases of the Chest"; Louis H. Clerf, Philadelphia, "Bronchiectasis: A Consideration of Its Causes and Its Prevention" and Isaac A. Bigger, Richmond, "Surgery of the Chest."

Society News.—Dr. Priscilla White, Boston, addressed the Richmond Academy of Medicine March 7 on "Some of the Newer and Interesting Phases of Diabetes."—Dr. Edwin E. Barksdale, Danville, addressed the Patrick Henry Medical Society in Martinsville January 13 on cutaneous diseases of importance to the general practitioner.—At a meeting of the Roanoke Academy of Medicine January 9 the speakers were Drs. Charles W. Dorsey on "Obstetrical Analgesia, Amnesia and Anesthesia"; Charles H. Peterson, "Use of the Roentgen Ray in Diagnosis and Treatment of Mediastinal Diseases," and Roger H. Du Bose, modification of fresh cow's milk with use of honey.

WISCONSIN

Personal.—The village of Cashton and the surrounding community honored Dr. Cornelius H. Cremer with a reception February 17 celebrating his fiftieth anniversary in the practice of medicine. Dr. Cremer, 74 years old, is president of the state board of medical examiners. About 1,200 persons attended the celebration.

Society News.—Dr. Robert F. McNattin, Chicago, addressed the Brown-Kewaunee-Door County Medical Society, Green Bay, March 9 on "Treatment of Benign and Malignant Lesions by Radiation Therapy."—Dr. Albert W. Bryan, Madison, Wis., discussed "Management of Neurosis" before the Barron-Washburn-Sawyer-Burnett County Medical Society, Barron, March 7.—Dr. Horton C. Hinshaw, Rochester, Minn., addressed the La Crosse County Medical Society, La Crosse, March 14 on "Recent Advances in Treatment of Pneumonia."—Dr. Ovid O. Meyer, Madison, addressed the

Outagamie County Medical Society, Appleton, March 16 on "Diagnostic Considerations in Diseases of the Spleen" and Dr. Victor F. Marshall, Appleton, on "Some Indications for Splenectomy."—Dr. Walter A. Fansler, Minneapolis, addressed the Pierce-St. Croix County Medical Society, New Richmond, March 16 on "Treatment of Hemorrhoids and Anal Fissure."—Drs. Benjamin B. Souster and Gordon R. Kamman, St. Paul, addressed the Polk County Medical Society, Amery, March 16 on "The Mechanism of the Heart Beat and Electrocardiography" and "Psychiatric Disorders Occurring in Middle Life" respectively.

Lectures and Clinics for Practitioners.—Lectures and clinics for practicing physicians will be held in Appleton April 18, in Madison April 19 and in Eau Claire April 20, a new activity under the auspices of the council on scientific work of the State Medical Society of Wisconsin. The speakers will be:

- Dr. Alexis F. Hartmann, St. Louis, Immunologic Program in Family Practice.
- Dr. Cleveland J. White, Chicago, Office Management of Syphilis.
- Dr. Richard W. McLirde, Baltimore, Office Gynecology; Practical Aspects of Gynecologic Endocrinology.
- Dr. Francis D. Murphy, Milwaukee, Treatment of Acute Medical Emergencies.
- Dr. Carl W. Eberbach, Milwaukee, The Acute Abdomen.
- Dr. Leland S. McKittick, Boston, Early Recognition and Early Eradication of Cancer.
- Dr. Marion A. Blankenhorn, Cincinnati, Deficiency Diseases as Seen in Office Practice and Vitamin Therapy.

GENERAL

St. Louis University Alumni Dinner.—The alumni of St. Louis University School of Medicine will hold a reunion dinner at the Missouri Athletic Association, St. Louis, May 17, 6:30 p. m. Additional information may be obtained from the alumni office, 221 North Grand Boulevard, St. Louis.

Guggenheim Foundation Awards.—The John Simon Guggenheim Memorial Foundation has announced its annual award of fellowships. They include the following in the field of the biologic sciences:

- Leland S. McClung, Ph.D., instructor in research medicine, Hooper Foundation for Medical Research, University of California, for studies of certain disease-producing and food-spoiling bacteria.
- Dr. Henry N. Harkins, instructor in surgery, University of Chicago, for research into the nature and causes of surgical shock.
- Alfred George Marshak, Ph.D., Boston, physiologist, for investigation into the mechanism of chromosome division.
- Isidore Gersh, Ph.D., instructor in anatomy, Johns Hopkins University School of Medicine, Baltimore, for studies of the intracellular distribution of certain organic compounds.

Special Society Elections.—Dr. James D. Bruce, Ann Arbor, Mich., was named president-elect of the American College of Physicians at the annual meeting in New Orleans March 30. Dr. Oliver H. Perry Pepper, Philadelphia, was installed as president and the following vice presidents were elected: Drs. Allen A. Jones, Buffalo; Gerald B. Webb, Colorado Springs, Colo., and James Morrison Hutcheson, Richmond, Va.—Dr. John J. Morton Jr., Rochester, N. Y., was elected president of the American Society for the Control of Cancer at the annual meeting of the board of directors in New York March 4. George H. Smith, Ph.D., New Haven, Conn., is vice president and Dr. Frank E. Adair, New York, secretary.

Special Itineraries to Biologists' Meeting.—Three separate itineraries have been planned for persons attending the Federation of American Societies for Experimental Biology in Toronto April 27-29. Itinerary number 1, leaving Chicago April 25 at 11:59 p. m., includes a day in Detroit with a trip to the Ford plant and museum. Trip number 2 will leave April 25 at 8 p. m. and trip number 3 Wednesday April 26, 8 p. m. Rates for these all-expense tours represent substantial savings. Those who wish to make the trip must signify their intentions not later than Monday April 17. Further information may be obtained from Dr. Arno B. Luckhardt, department of physiology, University of Chicago, Chicago; telephone: Midway 0800, local 963.

Pan-Pacific Surgical Meeting.—The third congress of the Pan-Pacific Surgical Association will be held in Honolulu September 15-28 under the presidency of Dr. J. Hardie Neil, Auckland, N. Z. Motion pictures will be featured especially at the meeting and those who wish to present films are urgently requested to send them, registered, to Dr. Howard L. Updegraff, chairman of the section on surgical movies, 6777 Hollywood Boulevard, Hollywood, Calif., for technical editing. Among other features will be a hospital institute. The program chairman for the United States is Dr. Frederick L.

Reichert, San Francisco. Surgeons interested in obtaining further information may write to Dr. Reichert or to Dr. Forrest J. Pinkerton, Honolulu, secretary of the association.

American Pediatric Society.—The fifty-first annual meeting of the American Pediatric Society will be held April 27-29 at Skytop Lodge, Skytop, Pa. Among the addresses on the program will be:

- Drs. Gilbert M. Jorgensen and Henry S. Christian, New York, Treatment of Pneumococcal Infections in Children with Sulfapyridine.
- Dr. Edward C. Curnen Jr., Boston, Serum Treatment of Type XIV Pneumonia.
- Dr. Henry J. Gerstenberger, Cleveland, Experience with the Use of Phosphate for Treatment of Infantile Rickets.
- Dr. Frederic W. Schlutz, Chicago, Physical Fitness of the Child as Reflected by Cardiovascular and Blood Serum Changes During Exercise.
- Dr. Joseph Stokes Jr. and Dorothy R. Shaw, Philadelphia, Comparative Studies of the Antibody Response of Individuals Vaccinated with Human Influenza Virus.
- Dr. Alfred Hand, Philadelphia, Two Complete Recoveries from Cretinism.
- Dr. Irvine McQuarrie and Mildred R. Ziegler, Minneapolis, Experimental Studies Concerning the Pathologic Physiology of Insulin Convulsions.

Dr. Clifford G. Grulee, Evanston, Ill., is president of the society.

Commission on Graduate Medical Education Meets.—

"Considerable progress is being made in the clarification of the place of the internship, the residency, the short postgraduate courses and other educational opportunities in the broad field of graduate medical education," declared Dr. Willard C. Rappleye, New York, chairman of the Commission on Graduate Medical Education, following a meeting of the commission in New York City April 1. "With the cooperation of medical and hospital leaders, the commission hopes to offer constructive suggestions regarding needs now existing in the field of graduate medical education and opportunities for developing more adequate educational facilities by medical schools, hospitals, national and local medical organizations and specialty societies. It is felt that the need for more adequate graduate and post-graduate medical training is pressing and has been sharpened by the formation of the twelve specialty boards. It is gratifying to find that interest in these fields is now so widespread that it appears certain that hospitals, medical schools and other agencies will develop satisfactory programs to meet this need in the near future." The commission expects to complete its work within a year and at that time will publish a full report of its observations and conclusions.

National Academy of Sciences.—The annual meeting of the National Academy of Sciences will be held at its headquarters, 2101 Constitution Avenue, Washington, D. C., April 24-25. The speakers on the scientific program include:

- Dr. Warren H. Lewis, Baltimore, Changes in Viscosity and Cell Activity.
- Karl Sax, Sc.D., Arnold Arboretum, Jamaica Plain, Mass., The Time Factor in X-Ray Irradiation.
- Dr. August Krogh, Copenhagen, Denmark, The Active Uptake of Ions by Organisms.
- Duncan A. MacInnes, Ph.D., and Lewis G. Longworth, Ph.D., New York, Electrophoretic Studies in Blood Studies on Blood Sera.
- Gioacchino Failla, D.Sc., and Kanematsu Sugiura, New York, Experimental Results Supporting the "Fluid Flow" Theory of the Biological Action of Ionizing Radiations.
- Dr. Herbert M. Evans and Gladys A. Emerson, Ph.D., Berkeley, Calif., Degrees of Sterility in the Female Rat Held on E-Free Rations.
- Dr. Henry Borsook, Dr. Marshall Y. Kreners and C. G. Wiggins, Pasadena, Calif., Relief of Symptoms in Major Trigeminal Neuralgia (Tic Douloureux) Following the Administration of Massive Doses of Vitamin B Supplemented in Some Instances by Concentrated Liver Extract.
- Dr. Walter B. Cannon, Boston, A Law of Denervation.

Warning Against Impostor.—Wake Forest College, N. C., and the University of Pennsylvania School of Medicine, Philadelphia, have reported activities indicating that an impostor is attempting to use credentials of a graduate of the two schools. Herman William Farber, formerly of Weldon, N. C., graduated from Wake Forest in 1930 with the bachelor's degree and from the two year school of medicine in 1932. He then finished his medical course at the University of Pennsylvania, graduating in 1934. In September 1938 both schools received letters signed Herman William Farber and requesting copies of his diplomas because the originals had been destroyed by fire. In addition the letters asked for official transcripts of credits for presentation to state licensing boards. Wake Forest sent the transcripts of Farber's college record, both liberal arts and medicine, to Farber at Evansville, Ind., as he requested. Later he wrote to ask if the Wake Forest officials would affix the college seal to the transcripts. The college agreed to do this but reports that the transcripts were never received. Late in October the duplicate diplomas were sent to Farber in care

of General Delivery at Evansville. The real Dr. Farber is living in Richmond, Va.; he has had his diploma since graduation and has never been in Evansville.

Annual Meeting of Health Officers.—The fifty-fourth annual meeting of the Conference of State and Provincial Health Authorities of North America will be held at the U. S. Public Health Service, Washington, D. C., April 21-22, under the presidency of Dr. Felix J. Underwood, Jackson, Miss. The speakers will include:

Lowell J. Reed, Ph.D., Baltimore, The Standard Million of Population.
Dr. Wilson C. Williams, Nashville, Tenn., Coordination of Health Education Between State Departments of Health and Public Instruction.

Dr. John O. Bower, Philadelphia, Public Health Aspects of Appendicitis.
Dr. Gregoire F. Amyot, Vancouver, B. C., British Columbia Program for Medical Care.

Dr. George C. Dunham, U. S. Army, Typhoid Vaccine, Duration of Immunity, Methods of Administration.

Dr. Willbur A. Sawyer, New York, The Health Officer's Interest in Virus Diseases.

Dr. Haven Emerson, New York, Current Practice in Communicable Disease Control.

Dr. Eugene L. Bishop, Chattanooga, Tenn., What Constitutes Public Health from an Administrative Standpoint.

Sunday morning April 23, through the courtesy of Col. Joseph F. Siler and Lieut. Col. George C. Dunham, medical corps, U. S. Army, a demonstration of the manufacture of typhoid vaccine and pneumonia vaccine, among other things, will be given at the Army Medical School laboratory.

FOREIGN

Society News.—The fourth World Congress of Workers for the Crippled will convene in London July 16-22 under the auspices of the International Society for Crippled Children and the English Central Council for the Care of Cripples. The program will deal with the industrial cripple, education and preventive orthopedics in childhood. Those desiring accommodation on the convention ship, the *S. S. American Merchant*, may secure space by writing to H. W. Roden, Travel Bureau, Mellon National Bank, Pittsburgh.

Cameron Prize Awarded to Professor Domagk.—The University of Edinburgh has awarded the Cameron Prize for 1939 to Prof. Gerhard Domagk, director of the Institute for Experimental Pathology, I. G. Farbenindustrie, Elberfeld, Germany, for his discovery of the treatment of bacterial diseases by compounds of the sulfonamide group. Dr. Domagk is 43 years old and a graduate in medicine of the University of Kiel. The Cameron Prize, amounting to about £200, is awarded annually to the person who in the opinion of the university senate has in the previous five years made any highly important and valuable addition to practical therapeutics.

Congress on Life-Saving and First Aid.—The fifth International Congress on Life-Saving and First Aid to the Injured will be held in Zurich and St. Moritz, Switzerland, July 23-28. All agencies concerned with life-saving and first aid are invited to send delegates. Eight sections are being organized: rescue work and first aid in catastrophic events and international traffic; first aid to the injured in general; organization of first aid, rescue work and first aid (including protective measures); first aid on the coast and inland waters; first aid at sporting events and the history and idea of life-saving and first aid. The languages of the congress will be French, German, Italian and English. Inquiries should be addressed to the Secretariat of the fifth International Congress for Life-Saving and First Aid to the Injured, Schmelzbergstrasse 4, Zurich, Switzerland.

Missionary Society One Hundred Years Old.—The Canton Medical Missionary Society has been in existence 100 years. Because of the military occupation of the city, commemoration of the centenary has been postponed. The society was founded by three missionaries, two of whom were physicians, in 1838 for the principal purpose of conducting the Canton Hospital, founded three years earlier. A further object was to establish and maintain hospitals and dispensaries throughout China. The present hospital was opened in 1935. At that time also the cornerstone was laid for the Dr. Sun Yat Sen Medical College. During the past year it has cared for hundreds of victims of aerial bombing and is still functioning, though full of poor patients, admitted chiefly from refugee camps, according to a newspaper account. Dr. William W. Cadbury is superintendent of the hospital. The society has constantly worked with the foreign mission boards, which have provided and maintained the physicians to staff its hospitals; present operation of the hospital is made possible by contributions from the International and the American Red Cross.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 18, 1939.

Gas Masks for Babies

The whole civilian population of the country has been supplied with masks protective against gas attacks from the air, but the problem of producing a mask suitable for young children has proved difficult. After three years of continuous research a mask has been made for children under the age of 2 years. It resembles a helmet and consists of a hood of impervious fabric fitted with a large window of cellulose acetate. The hood encloses the head, shoulders and arms of the child and is closed round the waist by a draw-tape. The baby inside can thus move its arms and put its hand to its mouth—an important point, it was found, in keeping the baby quiet. The hood is surrounded by and fastened to a light metal frame, which is lengthened on the under side and fitted with an adjustable tailpiece as a support and protection for the child's back. The tailpiece is turned up at the end to form a seat, which prevents the child from slipping out of the hood. The child is made secure in the helmet by means of a T shaped supporting strap connected to the end of the tailpiece. The hood is padded on the under side, where the child rests. Air is supplied to the inside of the hood by a rubber bellows. The air passes through a container which removes all poison gas, and it enters the hood at the top through an orifice which deflects it upward so that it sweeps out all vitiated air from the hood and also prevents the stream from blowing directly on the child's head. The space in the hood is large enough to allow pumping to be stopped for several minutes if required. Tests have shown that these masks are worn without inconvenience to the child and that they are effective in an atmosphere of lethal gas. For children between the ages of 2 and 5 years a special mask, similar to that for adults but with modifications introduced for the sake of comfort and further security, is being produced.

A Gestation Period of 174 Days

In the divorce court the fact that the earliest possible date for conception after marriage allowed a maximum of only 174 days for a child who survived birth was given as sole evidence of adultery on the part of the wife. In giving judgment the president said that this was the most remarkable case with which he had had to deal. There was not a shred of evidence that the wife was conducting any sort of association with another man. He quoted from Taylor's textbook, "Principles and Practice of Medical Jurisprudence": "It would be in the highest degree unjust to impute illegitimacy to offspring or want of chastity to parents merely from the fact of a 6 months child being born and surviving birth." He could dispose of the case on that passage, but there was also the evidence of the very experienced midwife that this and one other child were the most extreme cases of premature birth which she had seen in her experience of thirty years. The president was satisfied that the child was conceived in wedlock and dismissed the husband's petition but granted the wife a divorce on the grounds of the husband's adultery. It should be noted that in this case the age of the child at birth was exactly 6 lunar months and therefore less than 6 calendar months.

The Improved Health of the People

In the House of Commons the labor party claimed that malnutrition was prevalent, for which the government should provide a remedy. It may be pointed out that our people are the best fed in Europe and that the expenditure on the social

services, which include free meals for school children, is enormous. In the debate it was stated that the purchasing power of the working class was four times what it was at the time of the battle of Waterloo. Mr. Elliot, minister of health, said that the government had introduced the subject of nutrition into national discussion and had taken action in the light of the newer knowledge. The consumption of milk by school children had gone up and they were keeping up pressure on agriculturists to insure a pure supply. The following statistics showed the extent to which malnutrition was being repelled. In 1927 infant mortality was 70 per 1,000 and today it was 58; maternal mortality was 4.11 per 1,000 against 3.26 today. Maternal mortality from puerperal sepsis had fallen from 1.97 in 1927 to 0.98. The tuberculosis mortality had fallen from 79 in 1927 to 56 today. All indications pointed to an improvement in nutrition of children. A comparison between 1927 and 1937 showed that boys in Leeds were more than 1 inch (2.5 cm.) taller and 3½ pounds (1.5 Kg.) heavier and in Huddersfield were 1½ inches (3.7 cm.) taller and more than 5 pounds (2.5 Kg.) heavier.

PARIS

(From Our Regular Correspondent)

March 11, 1939.

Treatment of War Injuries Accompanied by Severe Hemorrhage

At the February 14 meeting of the Académie de médecine of Paris, two leading army surgeons, Maissonnet and Barthélemy, reviewed recent progress in the treatment of certain types of war injuries. A severe hemorrhage can threaten life under one of three conditions: 1. An artery of medium caliber is divided, but, during a battle, the injured soldier cannot be transported immediately and the bleeding continues for several hours, until extreme anemia supervenes. 2. An artery of large caliber is sectioned. Even though immediate care is given in both these forms of injury, the wound is either fatal or the soldier is found exsanguinated. 3. Multiple injuries to soft parts are individually of minor importance but the sum total is such that the soldier is found in an extremely anemic state. The treatment of these three types of injuries should be both local and general. As to the first, if an artery of moderate caliber in an extremity has been divided, after application of a tourniquet on the proximal side the soldier should be sent to the nearest casualty clearing station for more thorough treatment. If a large artery of an extremity has been sectioned, the only hope is that some one can close the opening digitally until a tourniquet is applied. For use in case of injury to a large artery of the neck, every front line surgeon should be provided with a set of sterile instruments for opening the wound and applying forceps to the bleeding vessel preparatory to transportation of the wounded man behind the lines. Many lives can be saved by this procedure. In the case of multiple wounds none of which involve an artery or vein of any importance, only firm compression with dressings is indicated, because treatment of multiple injuries at the front involves too much shock.

The general treatment includes blood transfusion and serotherapy. These should be employed only at a casualty clearing station equipped with facilities to permit care of the wounds at the same time. The use of citrated refrigerated blood is the only feasible method of transfusion except during a battle with sudden changes of the front lines, when it may be difficult to reach the injured with automobiles or airplanes carrying the conserved blood. During the Spanish war it was found that conserved blood was invaluable except during offensives and periods of instability of the front lines. By serotherapy is understood here the replacement of the blood which has been lost by the intravascular injection of artificially prepared sub-

stitutes, such as saline or acacia solutions. The disadvantages of the saline solutions are that they lack viscosity and osmotic pressure, the latter because of an insufficient quantity of colloids. Sherrington and Copeman have shown that saline solutions leave the circulation in less than an hour and a half after injection. Normet in 1929 proposed the addition of small quantities of the citrates of sodium, calcium, magnesium, iron and manganese to a 0.9 per cent saline solution. Gosset, Tzanck and Charrier (*Presse médicale*, Dec. 20, 1930, p. 1745) found that Normet's polycitrate solution, although not a substitute for blood, was not excreted as rapidly as physiologic solution of sodium chloride.

The best substitute for blood transfusion has been found to be injection of acacia solution as proposed by Bayliss; this solution is retained in the vessels long enough to enable the blood-forming organs to begin to function. Blood transfusion or, if no blood is available, injection of physiologic solution of sodium chloride or the Bayliss solution should be performed simultaneously with and not before local hemostasis. Every casualty clearing station should have an ample supply of flasks containing either the sterilized Normet polycitrate solution or the Bayliss acacia solution. In addition, every such advance center should have ready, as soon as an offensive begins, a supply of conserved refrigerated blood susceptible of being utilized within eight days of its collection from civilian donors as explained in a previous letter.

Sulfanilamide for Meningococcus B Meningitis

A case was reported at the January 20 meeting of the Société médicale des hôpitaux of Paris by the navy surgeons Germain and Gautron in which recovery from meningitis due to meningococcus B followed the use of sulfanilamide. A sailor aged 42 presented the typical clinical picture of meningitis. Cultures of the cerebrospinal fluid revealed the presence of meningococcus B. Without waiting for the results of the examination of the spinal fluid, the patient was given sulfanilamide immediately on admission to the hospital, at first 8 Gm. daily by mouth. During the first three days and again on the fifth day, from 20 to 30 cc. of an 0.8 per cent solution was given intraspinally. Altogether, 107 Gm. of sulfanilamide was given. Twenty-four hours after treatment was begun there were a drop in the temperature and a decrease in the headache and somnolence. At the end of forty-eight hours the temperature was normal, there was less rigidity of the neck and cultures of the spinal fluid were sterile. The only complication was a slight cyanosis of forty-eight hours' duration. Recovery was complete eighteen hours after the beginning of treatment.

Death of Dr. Antoine Bécère

The dean of French radiologists, Dr. Antoine Bécère, died February 25 in Paris at the age of 82. About a year after the discovery of the x-rays Bécère was present during a radioscopic examination for suspected pulmonary tuberculosis. He immediately foresaw the future of this new method of diagnosis and began to devote his energies to its clinical application, being one of the first to recommend the use of a dark room and of a fluoroscope in the examination of lesions of the chest. He soon extended the roentgen method to the diagnosis of pathologic changes in other viscera and then began to study the effects of roentgen therapy on neoplasms. He was elected a member of the Academy of Medicine of Paris as a recognition of his contributions to the development of roentgenology. During the World War Dr. Bécère was in charge of a school in which radiologists were trained for service in army hospitals. After the war and until a few weeks before his death, he took a vigorous part in the activities of the various medical societies in France and foreign countries. He suggested the use of iodized oil as an opaque medium in

the diagnosis of uterine and tubal lesions. During the past twenty years he had become interested in the relation of ovarian and testicular tumors to the hypophyseal hormones and in many other research problems. In 1936 many of his former pupils met to celebrate the eightieth birthday of this untiring worker, who until a few days before his death was busy editing a paper on experimental studies at the Radium Institute of Paris. In addition to serving a term as president of the Academy of Medicine, the leading society here, Dr. Bécclère was an honorary member of many French and foreign medical organizations.

BERLIN

(From Our Regular Correspondent)

Feb. 27, 1939.

The Quinine-Calcium Treatment of Pneumonia

Professor Kalk, a pupil of Professor von Bergmann and director of a large Berlin hospital, recently discussed the quinine-calcium treatment of pneumonia before the Berlin Medical Society. The pneumonia mortality has at present come to exceed that of tuberculosis; in many hospitals every fifth patient and in some instances every second patient succumbs to the disease. Moreover, as it is now seventeen years since the introduction of quinine therapy by von Bergmann, comparison of this method with serotherapy has become possible. Within the past four years Kalk has observed more than 2,000 cases of pneumonia. The picture often varies according to the age group; bronchopneumonia preponderates among children, lobar pneumonia is most important among younger adults, whereas bronchopneumonia again comes to the fore among the elderly. This linear scheme may be extended into the immunobiologic circular scheme of the negative and positive energy. Kalk regards pneumonia as a secondary illness; in virtually all his cases a meticulous study disclosed the history of some infection, such as a mild influenza or a cold, which had been manifested from two to three weeks previously. When later the patient experienced chills, the earlier, minor disturbance would tend to be forgotten. This circumstance suggests the concept of nonspecific sensitization, as developed by von Bergmann and the Berlin pathologic anatomist Professor Rössle.

Kalk discussed the influence of weather on the pneumonias and reported observations of the interrelation of normal atmospheric temperature and relative humidity. If the temperature is lowered and the moisture content of the air is high (as in oceanic drops in temperature originating in the west) the pneumonie morbidity curve will exhibit a sharp upturn, conditioned by the great concomitant deprivation of heat; the coolness of the weather may be still further enhanced by strong winds. The author found that vitamin C deficiency increases susceptibility to pneumonia and acts unfavorably on the course of the disease.

Professor Kalk himself has had pneumonia six times and in three of these instances cut short his illness by the use of quinine. He is a confirmed advocate of parenteral quinine therapy combined with the administration of calcium. If utilized in time, this procedure bids fair not only to arrest the pneumonia but also to inhibit infiltration. If infiltration is already present, the procedure appears as a rule to induce earlier resolution. Parenteral quinine-calcium therapy is thus effective at times when the use of quinine alone does not suffice. Kalk was able to obtain like results in bronchopneumonia by the utilization of similar quinine preparations.

The pneumonia mortality among Kalk's clinical material has shown a decline of from around 23 per cent to 16 per cent since the utilization of quinine-calcium preparations. In army hospitals, according to the latest reports, the decline has been from 9.8 per cent to 4.9 per cent. The army figures provide the best possible illustration of how effective this therapy can be if it is

introduced in the initial stage of the illness; this timely treatment is particularly feasible in the army, thanks to the highly efficient organization of the medical corps. Kalk discusses reports of lesions allegedly caused by quinine therapy. He considers the use of the term "lesions" here unjustifiable. In a total of 60,000 injections of quinine only seven, according to the author's observations, were followed by the formation of an abscess; in addition, paralysis of the peroneal muscles was observed in but one instance. From the foregoing data it will be seen that in view of the enormous advantage of this therapy one cannot correctly speak of it as "dangerous." As to serotherapy, Kalk simply remarks that, although at present thirty-two different strains of pneumococci are differentiated, thus far the mortality has been lowered only in cases based on types I and II, and then never by as much as 50 per cent. For this reason as well as on account of the greater expense involved, the author feels unwilling to recommend serotherapy. It would seem that Kalk has never carried on any large scale studies of serotherapy, such as would form a true basis for comparison. But even in the absence of a comparative evaluation his data on the favorable results of quinine-calcium therapy are still interesting.

AUSTRALIA

(From Our Regular Correspondent)

March 1, 1939.

The Association for the Advancement of Science

The twenty-fourth biennial meeting of the Australian and New Zealand Association for the Advancement of Science was held in Canberra January 11-18. Attracted by the unique circumstances of meeting at the federal capital and by the fact that the association executive had succeeded in securing the presence of several overseas notables, a record membership of 1,200 delegates attended the meeting. Overseas visitors included Prof. Ralph Carr and Dr. Anita Muhl, representing the American Association for the Advancement of Science; Prof. F. T. Brooks, representing the British Association; Sir E. John Russell, Rothamstead Agricultural College; Prof. N. Y. Sidgwick (Cambridge), noted chemist; Sir John Flett, Sir George Simpson and Mr. H. G. Wells. The sections represented were mathematics, physics, astronomy, optometry, geology, zoology, history, anthropology, economics, statistics and social science, engineering and architecture, medical science and national health, education, psychology and philosophy, agriculture and forestry, veterinary science, botany, physiology, pharmaceutical science, geography and oceanography. The congress was perhaps disappointing to the extent that little official attempt was made to relate the discoveries of science to the personal experience of everyday life and no constructive recommendation of any social significance emerged from it.

THE AUSTRALIAN JOURNAL OF SCIENCE

The Australian National Research Council, which was derived from the association some years ago, has, after a period of independent existence, now become in effect a committee of the association. The council has commenced the publication of a journal of the type of *Nature*. This journal now appears bimonthly as the *Australian Journal of Science*. The journal aims to cover a field including short advance summaries of research, periodic accounts of recent work in various branches of science, book reviews, proceedings of scientific societies, doings in Australian universities and museums, current news, personal information and correspondence.

HEART SIZE IN RELATION TO EXERCISE

Dr. Fritz Duras, director of physical education in the University of Melbourne, submitted a paper on heart size in relation to exercise. He discussed the results he had obtained from the

measurement of heart size after various types and intensities of exercise. Measurements were made of the lateral diameter on a fluoroscopic screen. He had found that heart size decreased during static work, increased during moderate dynamic work and increased only slightly, if at all, during more strenuous work. After exercise the size of the heart fluctuated about a continually increasing mean size and might not return to preexercise measurement for forty-eight hours. He also considered the possibility of complete relaxation of heart muscle being prevented by fatigue. The normal heart could not be damaged even by the most strenuous exercise but the normality must be established by proper medical examination.

MAXIMUM POWER OF HUMAN WORK

Considering the maximum power of human work, Dr. F. S. Cotton of Sydney has found champion cyclists to be able to work for five minute periods at rates in excess of one-half horse power. These figures are materially higher than the highest recorded figures for this period of work, namely those of Olympic oarsmen, in spite of the fact that the latter figures included a somewhat arbitrary allowance for work not used in propelling the boat.

TISSUE INJURY BY RADIANT ENERGY

Drs. C. H. Kellaway and E. R. Tretliwicz reported the results of recent experiments carried out at the Walter and Eliza Hall Institute, Melbourne. Injury by radiation caused the isolated lung preparation to liberate histamine in a manner similar to a number of pharmacologically active substances, such as venoms and peptone. The injurious effect of light on tissues sensitized by dyes was not confined to regions normally exposed to radiation. Histamine was destroyed by photodynamic action in the presence of oxygen, as for instance in suspensions of ground lung tissue, when the histamine content disappeared on exposure to light. The response of histamine of an isolated jejunum preparation of a guinea pig sensitized with hematoporphyrin protoporphyrins rapidly diminished on exposure to light. Methylene blue caused increased sensitivity of the intestine to histamine in the dark; in bright illumination the effect rapidly diminished. Eosin had a slow contracting effect on the intestine, which in bright illumination failed to relax readily following histamine contractions. The injury to muscle cells in these experiments was such that they failed to respond to the histamine, which was almost certainly set free and which might also have been destroyed by photodynamic action.

CHEMISTRY OF HEMOGLOBIN METABOLISM

In a paper on the chemistry of hemoglobin metabolism, Dr. R. Lemberg of Sydney said that it had heretofore been assumed that hematin and porphyrin were intermediate products in the change from hemoglobin to bile pigments, the removal of protein being followed by that of iron and the porphyrin transformed into bilirubin. It could now be shown that the real intermediate products were bile pigment-hematin compounds and biliverdin, the oxidative opening of the porphyrin ring occurring before the removal of protein and iron. The reaction began with the hydrogenation of oxyhemoglobin. Among the intermediate compounds were those with "easily detachable iron." Finally, biliverdin was reduced by dehydrogenase systems to bilirubin. In the intestine bilirubin was reduced to urobilin. The iron from the bile pigment-hematin compounds was used for the synthesis of hemoglobin, but nothing was known about the synthesis of the porphyrin ring in the animal body. In different circumstances oxidations might occur at the side chains and not on the porphyrin nucleus. Under these conditions biologically important catalysts might be formed.

Dr. Lemberg exhibited his own preparations of many of the blood pigments and their intermediate products.

SYMPOSIUM ON ANIMAL PIGMENTS

Contributing to a symposium on animal pigments, J. W. Legge of Sydney discussed the physiologic disintegration of hemoglobin in the animal body. He supported Lemberg's theory and presented evidence for the formation of intermediate bile pigment-iron-protein by oxidation of the α -methene bridge of the porphyrin molecule of hemoglobin. With choleglobin, the best known of these compounds, reversible combination with oxygen and carbon monoxide could be observed spectroscopically. By action of ascorbic acid on hemoglobin in air a second similar compound was formed. Both compounds occurred in normal erythrocytes and were formed when blood containing dissolved hemoglobin was perfused through the spleen, or after in vivo hemolysis by the action of distilled water, arsine or phenylhydrazine. From these intermediate compounds, removal of iron and protein gave biliverdin. Both dehydrogenases could reduce this to bilirubin.

VIRUS ACTIVITY OF SOME PROTEIN MOLECULES

R. J. Best of Waite Institute, Adelaide, described his recent work which had resulted in the separation of certain viruses in a chemically pure state and had demonstrated that they were proteins. He showed evidence for the identity of protein and infective principle in the case of certain plant viruses and described some aspects of the gross physical structure of the virus as revealed by x-ray analysis and optical means. He mentioned a few of the properties of viruses most likely to influence biologic activity and touched on problems relating to strain variation, mutation and possible methods by which viruses might multiply. The virus molecules built themselves into long chains, quite readily visible microscopically in polarized light. These chains were readily broken up mechanically but on standing they formed again. In subsequent discussion it was considered questionable whether the purified virus proteins could be regarded as crystals, as they were only two dimensional. True crystals on the other hand were characterized by definite angles between faces in three planes. The multiplication of virus could not be considered apart from its association with the host. It was built on the cell mosaic of the host cell. It was doubtful whether the increase of virus protein in infected cells could be regarded as a multiplication of these protein molecules. It might be considered that the virus modified the metabolism of the cell in such a way that some virus protein was produced by it in place of its normal protein. It was also suggested that the virus might be regarded as a proteolytic enzyme which, acting on the cell proteins as substrate, produced from them virus protein as one of the products of its action.

Marriages

LAURA C. GAETJENS, Oradell, N. J., to Mr. J. Perry Morris of Norfolk, Va., in Pensacola, Fla., February 19.

EDGAR GILMORE GIVHAN JR., to Miss Margaret Woodward Spencer, both of Birmingham, Ala., February 22.

JAMES B. GILLESPIE, Urbana, Ill., to Mrs. Emily Reeve of Paxton, in San Antonio, Texas, February 27.

CARL NORMAN GIERE, Minneapolis, to Miss Helen Louise Butler of Fort Sill, Okla., January 27.

EDWARD HUMPHREYS HERRING to Mrs. Lucile Sherrod Collins, both of Raleigh, N. C., January 7.

PAUL HAYNE CULBREATH JR., Ellenton, S. C., to Miss Sara Miller of Hodges, Dec. 29, 1938.

PHILIP H. NIPPERT, Atlanta, Ga., to Miss Lucille Garrison of Miami, Fla., February 8.

LEWIS KARL HOHERMAN to Miss Esthermae Bogan, both of Philadelphia, recently.

SOL NEIDICH to Miss Evelyn Rudowitz, both of Beaufort, S. C., Dec. 25, 1938.

JOHN S. HAINES, Baltimore, to Miss Clara Elizabeth Ward, January 14.

Deaths

William Hallock Park * eminent as a medical contributor to the field of public health and noted as a bacteriologist and immunologist, died in New York April 6 of heart disease. Dr. Park was born in New York Dec. 30, 1863. After graduation from the College of the City of New York in 1883 he received the degree of doctor of medicine at Columbia in 1886. Following three years of internship at Roosevelt Hospital he went to Vienna during 1889-1890, returning to New York to take up practice as a specialist in diseases of the nose and throat. While engaged in this work he carried on research at the College of Physicians and Surgeons, concerning himself particularly with diphtheria. This work commanded the attention of Dr. Hermann M. Biggs, who at the time was professor of bacteriology and hygiene at New York University and also in charge of one of the divisions of the New York City Health Department. Dr. Park was appointed bacteriologic diagnostician of diphtheria in the city health department and director of its research laboratory in 1894. There the first municipal bacteriologic laboratory in the United States was organized. The methods of diagnosis, control and prevention of communicable disease originated under Dr. Park have since been adopted throughout the world. For forty-two years, until the time of his retirement, Dr. Park continued his labors as active head of the public health laboratory, serving as consulting bacteriologist to the New York State Department of Health from 1914 onward, medical examiner in bacteriology from 1917 and consulting bacteriologist at the U. S. Quarantine Service from 1921.

In 1898 Dr. Park was appointed adjunct professor of bacteriology and hygiene at the New York University; in 1899 he became associate professor and in 1900 professor, holding this position until 1933, when he became first incumbent of the Biggs chair of preventive medicine. For one year he served as dean of the medical college. From 1895 to 1932 he was visiting bacteriologist to the Willard Parker Hospital and later served as consultant. In 1910 he received the honorary LL.D. degree from Queens University. In 1926 he was awarded the degree of doctor of science by New York University, in 1929 by Yale University and in the same year by Columbia University. During his career he also received many honors such as the Public Welfare Medal of the National Academy of Sciences in 1932 and the George M. Kober Medal of the Association of American Physicians in 1937. In 1933 he received also the Townsend Harris Medal for his achievements in medicine. In 1935 he received the Roosevelt Medal because of his contributions to the control of diphtheria. On his seventy-first birthday, Dec. 30, 1934, his assistants in the New York City Department of Health presented him with a bronze bas relief plaque of himself to be placed in the Willard Parker Hospital. When the William Hallock Park Laboratory, named and dedicated in his honor in 1936, was established President Franklin D. Roosevelt wrote him a letter in which he said, "Your contribution to medical progress will continue to benefit the people of New York, of this nation and of the world long after this splendid laboratory has crumbled to dust."

From time to time Dr. Park was called to deliver lectures before famous organizations. Thus he gave the Nathan Louis Hatfield lectures of the College of Physicians of Philadelphia in 1935. He received the Achievement Award of the Columbia Alumni Association of the Graduate Schools in 1934. In 1933, at a great celebration, he immunized against diphtheria the

millionth child to be inoculated in New York City, the first of the second million being immunized by Dr. Béla Schick. When it was proposed to develop a method of inoculation against infantile paralysis in 1934, he voluntarily submitted himself to be one of the first three injected.

Dr. Park was a frequent contributor to medical literature. His works included "Pathogenic Micro-Organisms," of which the tenth edition appeared in 1933; "Public Health and Hygiene" in 1927; "Who's Who Among the Microbes" in 1929. Among the research problems to which he turned his attention in addition to methods of immunization against diphtheria were the character of the tubercle bacillus, the nature of dysentery, the typhoid bacillus and typhus carriers, intraspinal injection of tetanus antitoxin, the bacteriology of respiratory infections and the treatment of pneumonia.

He was a member of most of the leading societies in the fields of his scientific interest, and he had served as president of the American Society of Experimental Pathology and of the American Public Health Association.

His death at the advanced age of 75 terminated a career of great importance and of vast benefit to the people and the medical profession of our country.

Donald Gregg * Wellesley, Mass.; Harvard University Medical School, Boston, 1907; fellow of the American College of Physicians; member of the American Neurological Association, American Psychiatric Association, New England Society of Psychiatry, Association for Research in Nervous and Mental Diseases and the American Psychopathological Association; president of the Massachusetts Society for Mental Hygiene; instructor in physical diagnosis, 1910, and assistant professor of tropical medicine in 1911 at the University of the Philippines, Manila; medical superintendent of the Channing Sanitarium; aged 58; died, January 6, in Massachusetts General Hospital.

Leonard Woolsey Bacon, New Haven, Conn.; Yale University School of Medicine, New Haven, 1892; member of the Connecticut State Medical Society; served during the World War; assistant in medical clinic 1892-1894, assistant in surgical clinic 1895-1897; instructor in operative surgery 1897-1905 and instructor in surgery 1905-1906 at his alma mater; for many years on the staff of the Grace Hospital; aged 73; died, January 8, of arteriosclerosis at his home in Hamden.

Henry Corbin McClenahan, San Francisco; Tulane University of Louisiana School of Medicine, New Orleans, 1895; member of the California Medical Association; veteran of the Spanish-American War; at one time assistant in clinical neurology and associate to the chair of legal medicine and psychiatry, Cooper Medical College; aged 67; died, Dec. 11, 1938, of arteriosclerosis, myocarditis and hypertension.

William Cott Hobdy * San Francisco; Columbia University College of Physicians and Surgeons, New York, 1896; formerly connected with the U. S. Public Health Service; on the staffs of the Stanford University and Franklin hospitals; aged 68; died, Dec. 26, 1938, of carcinoma of the liver with metastases.

Emil Gustave Winter, Indianapolis; Eclectic Medical Institute, Cincinnati, 1907; Indiana University School of Medicine, Indianapolis, 1908; served during the World War; formerly county deputy coroner; aged 52; on the staff of the Methodist Hospital, where he died, Dec. 18, 1938, of acute coronary occlusion.

William Gray Thigpen, Montgomery, Ala.; Tulane University of Louisiana School of Medicine, New Orleans, 1901; member of the Medical Association of the State of Alabama; served during the World War; aged 59; died, Dec. 11, 1938, in the Veterans Administration Facility, Biloxi, Miss., of pneumonia.



WILLIAM HALLOCK PARK, M.D., 1863-1939

Nicholas De Haas, Fremont, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1893; past president of the Newaygo County Medical Society; aged 68; was chief of staff, 1916-1917 at the Gerber Memorial Hospital, where he died, January 18, of carcinoma of the stomach.

Robert Hubert Fegers, Keokuk, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1906; member of the Iowa State Medical Society; aged 55; on the staffs of the Graham Protestant Hospital and St. Joseph's Hospital, where he died, Dec. 26, 1938.

Harry Joseph McGuire, Tulsa, Okla.; Rush Medical College, Chicago, 1926; member of the Oklahoma State Medical Association; formerly city health superintendent; on the staff of the Morningside Hospital; aged 38; died, Dec. 24, 1938, of cerebral hemorrhage.

William Henry Robin, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1891; member of the Louisiana State Medical Association; formerly health officer of New Orleans and Orleans Parish; aged 69; died, February 9, of heart disease.

John Henry Carpenter Ⓢ Chicago; National Medical University, Chicago, 1901; member of the Radiological Society of North America; at one time x-ray technician at Cook County Hospital; aged 65; died, January 18, of carcinoma of the esophagus.

Samuel Walter R. Langdon Ⓢ Stockton, Calif.; University of California Medical Department, San Francisco, 1900; formerly health officer; on the staff of the Stockton State Hospital; aged 65; died, Dec. 30, 1938, of cardiovascular renal disease.

John Thomas Dawson, Seattle; Toledo Medical College, 1895; member of the Washington State Medical Association; veteran of the Spanish-American War; on the staff of the Providence Hospital; aged 65; died, January 12, of coronary thrombosis.

Alonzo Wells Connor, Neeses, S. C.; Medical College of the State of South Carolina, Charleston, 1895; formerly member of the state legislature; aged 67; died, January 2, of diabetes mellitus, cardiac insufficiency and prostatitis.

Frank R. Ross, Houston, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1897; member of the State Medical Association of Texas; aged 63; died, Dec. 4, 1938, in a local hospital of lung abscess.

Charles Clary Rathbone, Los Angeles; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1893; aged 73; died, Dec. 27, 1938, of chronic myocarditis and arteriosclerosis.

Frank Cyril Barltrop Campbell, Owen Sound, Ont., Canada; University of Toronto Faculty of Medicine, 1921; at one time health officer of Henderson and Pulaski counties, Ky.; aged 40; died, Dec. 3, 1938.

John Henry Shipley, Rippey, Iowa; Drake University Medical Department, Des Moines, 1889; member of the Iowa State Medical Society; aged 72; died, Dec. 10, 1938, of valvular heart disease.

Edwin Augustus Kuhns, Emlenton, Pa.; Jefferson Medical College of Philadelphia, 1884; aged 80; died, Dec. 16, 1938, of carcinoma of the ascending colon with involvement of the liver.

Charles L. Reading, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1891; aged 68; died, Dec. 14, 1938, in the Allentown (Pa.) State Hospital, of chronic myocarditis.

Jerry Calvin Falvey, Longview, Texas; Memphis (Tenn.) Hospital Medical College, 1911; aged 52; died, Dec. 19, 1938, in the Wilson Memorial Hospital, Johnson City, N. Y., of endocarditis.

David Louis Axilrod, Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1903; aged 61; died, January 14, in the Asbury Hospital of cerebral hemorrhage.

George Krauss, Allentown, Pa.; Jefferson Medical College of Philadelphia, 1896; served during the World War; on the staff of the Allentown Hospital; aged 65; died, Dec. 30, 1938, of myocarditis.

Orville Leon Hanlon Ⓢ Ridgely, Maine; Medical School of Maine, Portland, 1901; past president of the Oxford County Medical Society; aged 63; died, Dec. 10, 1938, of coronary thrombosis.

James Edward Stubbett, Oakland, Calif.; University of the City of New York Medical Department, 1881; aged 79; died, Dec. 3, 1938, of myocarditis, arteriosclerosis and prostatic obstruction.

Perry Lee Atkins, Grants, N. M.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; aged 61; died, January 27, in a hospital at Albuquerque, of lobar pneumonia.

Caswell H. Jennings, Wheatland, Ind.; Medical College of Indiana, Indianapolis, 1895; formerly coroner of Greene County; aged 67; died, Dec. 25, 1938, in Terre Haute of coronary occlusion.

William Raney Black, Seminole, Okla.; Chattanooga (Tenn.) Medical College, 1906; member of the Oklahoma State Medical Association; aged 60; died, Dec. 22, 1938, of angina pectoris.

John Edward Brinkman Ⓢ Waterloo, Iowa; Illinois Medical College, Chicago, 1898; past president of the Black Hawk County Medical Society; aged 64; died, Dec. 23, 1938, of angina pectoris.

Ephraim G. McCormick, Prairie Grove, Ark.; Missouri Medical College, St. Louis, 1881; member of the Arkansas Medical Society; aged 83; died, Dec. 12, 1938, of cerebral hemorrhage.

Fred Augustus Bragdon, Springvale, Maine; Medical School of Maine, Portland, 1883; member of the Maine Medical Association; aged 80; died, January 24, of carcinoma of the liver.

George McGehee Stewart, Covington, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1901; aged 76; died, Dec. 27, 1938, in Jackson of arteriosclerosis.

William H. Cowell, Shawboro, N. C.; Kentucky School of Medicine, Louisville, 1893; aged 68; died, Dec. 27, 1938, of chronic myocarditis and hypertrophic cirrhosis of the liver.

Reno N. Williams, Sanders, Ky.; Hospital College of Medicine, Louisville, 1898; member of the Kentucky State Medical Association; aged 77; died, Dec. 26, 1938, of heart disease.

Harvey Albert Dever, El Reno, Okla.; Medico-Chirurgical College of Kansas City, Mo., 1904; aged 64; died, Dec. 25, 1938, in St. Anthony's Hospital, Oklahoma City, of pneumonia.

George Adelbert Delamater, Butler, Mo.; Chicago Homeopathic Medical College, 1893; aged 73; died, Dec. 22, 1938, in South Winter Haven, Fla., of coronary thrombosis.

William V. Marshburn, Yorba Linda, Calif.; University of Louisville (Ky.) Medical Department, 1886; aged 83; died, Dec. 14, 1938, of hypostatic pneumonia and uremia.

Elmer D. Shadday, Montpelier, Ind.; Kentucky School of Medicine, Louisville, 1901; county health officer; aged 65; died, Dec. 19, 1938, of coronary sclerosis and myocarditis.

Edward V. Cherney, Springfield, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1903; aged 57; died, January 27, of Parkinson's disease.

Francis X. McPhillips, Vancouver, B. C., Canada; Manitoba Medical College, Winnipeg, 1889; formerly on the staff of St. Paul's Hospital; aged 72; died, Dec. 23, 1938.

Albert Charles McGeagh, Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1902; aged 63; died, Dec. 22, 1938, of coronary thrombosis.

Abraham L. Thomas, Chicago; Chicago Medical College, 1879; member of the Illinois State Medical Society; aged 88; died, Dec. 19, 1938, of carcinoma of the stomach.

Charles Solomon Cantough, Reading, Pa.; Jefferson Medical College of Philadelphia, 1914; aged 47; died, Dec. 16, 1938, in St. Joseph's Hospital of coronary thrombosis.

Hugh McCormick, New Auburn, Wis.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1892; aged 72; died, Dec. 17, 1938, of coronary thrombosis.

Charles Luther Kirtley, Challis, Idaho; Rush Medical College, Chicago, 1901; aged 65; died, Dec. 1, 1938, of coronary occlusion, nephritis and arteriosclerosis.

George Nicholas Vogelei, Chicago; Chicago College of Medicine and Surgery, 1913; aged 50; died, Dec. 27, 1938, of angina pectoris.

Henry W. Partlow, Olympia, Wash.; Detroit College of Medicine, 1893; aged 75; died, Dec. 4, 1938, of carcinoma of the sigmoid.

Caleb E. Carter, Tenaha, Texas; Memphis (Tenn.) Hospital Medical College, 1902; aged 69; died, January 15, of pneumonia.

William Lages, Fredericktown, Mo.; Missouri Medical College, St. Louis, 1891; aged 76; died, Dec. 19, 1938.

Samuel W. Downing, Salem, Mo.; Missouri Medical College, St. Louis, 1894; aged 68; died, Dec. 9, 1938.

Herbert Charles Fry, Brooklyn; Long Island College Hospital, Brooklyn, 1898; died, Dec. 4, 1938.

Correspondence

PRIORITY IN TECHNIC FOR PRESERVATION OF SERUM

To the Editor:—In THE JOURNAL, January 14, page 134, Dr. Leon Friedman stated that "Riehl and Schereschewsky in 1919 were the first to use glass capillary pipets, sealed by fusing in a flame, to preserve specimens of serum" for examination of *Spirochaeta pallida*.

I have seen priority in this useful method of preserving specimens containing *Spirochaeta pallida* credited to so many workers that I am at last impelled to state that I first used it in 1909 at the Military Hospital, Rochester Row, London, for preservation of specimens for teaching purposes, and it was described and illustrated in my "Diagnosis and Treatment of Venereal Diseases in General Practice," first published in January 1918.

In connection with the observation of Riehl, quoted by Dr. Friedman, that in such conditions *Spirochaeta pallida* remained motile up to fourteen days after collection, it may be of interest to recall that this time was greatly exceeded in experiments reported by McNabb and his associates (*Canad. Pub. Health J.* 24:405 [Sept.] 1933) and by myself (*Lancet* 1:156 [Jan. 20] 1934). To state the case as briefly as possible, the Canadian workers initiated an experiment to test whether transportation over long distances in capillary tubes would be practicable for specimens to be examined for *Spirochaeta pallida* by the dark-ground method. The specimens were collected in triplicate in London and sent first to Toronto, where motile spirochetes were found. Three were returned to me with one specimen collected in Toronto, and motile spirochetes were again found in all of them. I returned them to Toronto, sealed with wax between slide and coverslip, and after examination in Toronto the same slides were returned to me; motile spirochetes were still found in them both in Toronto and in London. Thus three specimens of chancre fluid crossed the Atlantic four times and one three times, and after these journeys the spirochetes in them were still motile. The lapses of time from the taking of the respective specimens to my last report to the Toronto workers were eighty days, seventy-one days, sixty-eight days and forty-six days. Actually after dispatch of this report motility continued to be noted in one specimen up to the eighty-fourth day after collection.

Dr. Friedman mentions that his specimens were expelled from the tubes by pressure from a small rubber bulb. I suggest that a much easier method is to heat the blind end of the tube in a small flame.

L. W. HARRISON, London, S.W. 1, England.
68 Eccleston Square.

DANIEL DRAKE—INFORMATION, PLEASE, ABOUT LETTERS WRITTEN BY HIM

To the Editor:—For more than twelve years I have been engaged in the preparation of a bibliography of Daniel Drake. The list of published writings is apparently almost completed. Some manuscript material and many letters have already been located. However, Daniel Drake was a voluminous letter writer, and undoubtedly there must be many letters in private hands or in libraries. I shall sincerely appreciate information concerning any letters or manuscript material by Daniel Drake. Due credit will be given in the published work, which will not go to press for several months.

EMMET FIELD HORINE, M.D., Louisville, Ky.
Associate Professor of Clinical Medicine, University of Louisville School of Medicine.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

GOLD FOR TUBERCULOSIS

To the Editor:—I note in my December 2 issue of the *Iowa State Register* an article regarding the cure of tuberculosis with a gold solution. Gold has been used in the treatment of tuberculosis all through the years of my fifty years of practice. Would you please advise me whether this solution has been found of real value and now a real cure for this disease. It would seem strange that Dr. Kime of Fort Dodge, Iowa, should find it necessary to go to far away India to publish a complete digest of this material and its methods of use in the *Bombay, India, Medical Digest*. It is also said that this method has been in part revealed by British and American medical journals. I am anxious to know whether this treatment has been found real and a cure for the tuberculosis victim. Would you please let me hear from you.

M.D., Iowa.

ANSWER.—Gold has been used in the treatment of various diseases for approximately twelve hundred years and for more than three centuries it has been employed intermittently in the treatment of tuberculosis. Interest in the gold treatment was revived in 1915. Experimental work as well as the treatment of patients with gold salts revealed the fact by 1920 that their administration is not always safe for the patient and that apparent benefits were due to hyperemia in the vicinity of the tuberculous lesion. There being no accurate method of controlling the degree of hyperemia, the reactions could be sufficiently severe to cause pulmonary hemorrhage.

In 1924 Møllgaard presented the results of some experimental work with a gold preparation known as sanocrysin. Since that time a large volume of work has been done with gold salts both experimentally and clinically. One of the most extensive studies conducted on tuberculous patients in this country was by Henriksen, Sweany and Hruby of Chicago, whose following conclusions represent a fair statement of the present status of the gold treatment for tuberculosis:

"1. About 50 per cent of tuberculous patients having a stationary or downward progressive advanced tuberculosis of the B or C types, when given sanocrysin in well regulated doses, will show (1) a rather prompt cessation of symptoms (drop of temperature and pulse, increase of weight and improvement of general condition), which changes tend to be permanent if the patient observes the usual measures of hygiene; (2) a clearing of tuberculous infiltration, with marked fibrosis and contraction of cavities, as shown by roentgenograms; and (3) changes from unfavorable laboratory findings.

"2. The remainder of the treated patients may be divided about equally into three classes: Those who show a temporary improvement for a few weeks to a few months, those who show no favorable change, and those who will not tolerate the drug at all.

"3. By all the methods of control available and carefully analyzed figures, we can conclude that there is a shortening of the convalescent period or prolongation of life or both in the treated patients of group 1.

"4. There seems to be a real indication for the drug's use as a supportive treatment in collapse therapy when patients are not doing well and when there is a beginning spread to the other side, or when there is need to clear up a slight involvement of one side in preparation for collapse therapy on the other.

"5. Sanocrysin may be used to speed the convalescence of patients with favorable prognosis, but this is usually unnecessary.

"6. The drug may be added to the armamentarium of the tuberculosis specialist for use when other measures are unavailable, as well as for other 'reacting' types when the skill of the physician is able to direct a successful course.

"7. More experiment is warranted, so that indications, contraindications and more favorable types may be better established, in all ages, stages, complications, types of the disease, and in both sexes."

For many years Dr. Kime has advocated the administration of gold in the treatment of tuberculosis. He has had ample time to demonstrate the efficaciousness of his treatment to his fellow workers in the state of Iowa as well as in the nation, particularly those who limit themselves largely to the field of tuberculosis. He has frequently discussed papers on the treat-

ment of this disease but neither his method nor his results have gained much favor among physicians.

The superintendent of one of the Iowa sanatoriums gave Dr Kime's "gold cure" an extensive trial approximately ten years ago with no favorable response on the part of any patient. Dr Kime then preferred charges against the superintendent on the ground of lack of cooperation and the like. However, the superintendent was vindicated and continued in his position.

Unfortunately, in the past good results have been reported from special forms of treatment when modern methods of examination were not used and the evidence available would not always justify a diagnosis of clinical tuberculosis. It is on such cases that most spectacular results have frequently been reported. Therefore, in his publication in the *Bombay Medical Digest* it is hoped that all cases reported by Dr Kime are described with reference to diagnostic procedures so that no question can be raised by any physician as to the actual existence of clinical disease when his treatment was begun. He should also have available to any physician who desires to review his material personally X-ray films of the chest in the beginning and periodically throughout the course of treatment, sputum reports from official laboratories, tuberculin tests, red cell sedimentation rates and every other bit of information that experts in tuberculosis would require in reaching a definite diagnosis. Furthermore, he should make available to the profession unmistakable evidence that his patients have remained well over a sufficiently long period of time to convince the expert that remissions have not been mistaken for "cures."

CANCER NOT TRANSFERABLE FROM ANIMAL TO MAN

To the Editor—In a pamphlet entitled "Cancer as a Public Health Problem" George W Cox, a state health officer of Austin, Texas writes, as follows (p. 4):

"At this time we have no facilities in the State Department of Health for the antemortem inspection of meat. Last year one report shows 125 animals were rejected for slaughter because they were cancerous. It is obvious that we may be eating a great deal of meat from cancerous animals. The question as to the danger of eating such meat has never been investigated, but it may have a bearing on our increasing cancer incidence. If it were possible for the State Department of Health to render this service, this danger along with others of similar magnitude would be controlled."

This paragraph appears to be endorsed by Dr J W E H Beck, general chairman of the public health committee of the Texas department of the American Legion, in a circular letter dated March 14. The statement sent by Dr Cox and Dr Beck's letter lead me to ask: Is there any danger of transmission of cancer in cattle to man? M D, Texas

ANSWER—There is no possibility and hence no danger of a transferring of cancer from cattle to human beings in the manner suggested by Dr Cox, because cancer is not transmissible even by transplantation from one mammalian species to another, e g from cattle to man. Human cancer is not an infectious or contagious process like tuberculosis or actinomycosis. The statement by Dr Cox should be corrected promptly because it may cause unfounded and unnecessary alarm with respect to an important source of human food.

TONSILLECTOMY AND SYPHILIS

To the Editor—A man of 25 came to me on July 1, 1938, with chronically inflamed much hypertrophied tonsils. His blood Wassermann reaction was found to be 3 plus. The absence of a history or sign of a penile lesion caused me to believe that the tonsils were the point of origin of his syphilis. Six intravenous treatments with 0.6 Gm of nearsphenamine and twelve intramuscular treatments of sodium bismuth thioylcollate caused his blood to show 2 plus. He is now in the second such course of treatment. His tonsils have receded much in size but are still moderately red; they are now about three times the normal size. Would you advise tonsillectomy? If so when? M D Wisconsin

ANSWER—A diagnosis of syphilis should never be made on the basis of a single positive or, especially, partly positive serologic test for syphilis in the absence of history or physical signs. There are too many opportunities for technical and biologic laboratory error to justify such a diagnosis. If, in the patient in question, the diagnosis of syphilis hinges on one "3+" complement fixation test followed after treatment by one "2+" test, one cannot be certain that the patient actually has syphilis. The serologic diagnosis should certainly be verified by check of the complement fixation test, by one or more reliable flocculation techniques, and in one or more laboratories other than that which performed the original test.

Whether the patient has syphilis or not, his tonsils, if chronically infected, should be removed and operation may be performed immediately. The only factors which influence surgical operations on syphilitic individuals are (a) the possible accidental infection of members of the operating team and (b) possible

failure of wound healing because of the association of trauma with syphilitic lesions. As to the former, the risk of infection to members of the operating team is almost wholly dependent on the duration of infection in the patient. If he has early syphilis, i e of less than two years' standing, and if he has not been previously treated, there is some risk. If, on the other hand, he has late syphilis, i e of more than five years' standing, whether or not he has been previously treated, there is little or no risk. In either case and whether the patient's syphilitic infection is early or late, the administration of a course of an arsenamine immediately prior to operation does away with the risk of infection. (Parenthetically, it should be remarked that laryngologists who operate without gloves are particularly prone to the development of extragenital chancres, and no operation, even that of tonsillectomy, should be undertaken with bare hands under any circumstances, whether the patient is known to have syphilis or not.)

The failure of wound healing is negligible without treatment and is entirely obviated by treatment before and after operation.

In the patient in question, therefore, tonsillectomy may be performed immediately without risk to patient or operator, but in the meantime the diagnosis of syphilis in the patient should be verified.

WIDAL TEST AND INTERCURRENT INFECTION

To the Editor—Following a three weeks' siege of bronchial pneumonia caused by mixed infection with *Streptococcus viridans* predominating, a patient had an exhaustive bronchial cough for two weeks with temperature between 99 and 101 F. Roentgenograms of the chest and examination of the sputum were negative but the Widal reaction was found positive in a dilution of 1:40. How long after immunization to typhoid will the Widal reaction be positive? Will prolonged low grade fever tend to cause a positive Widal reaction in a patient who has been immunized to typhoid several times, the last previous inoculation being three years ago? In this case an unhealed area in a bronchiectatic space could account for the fever but why the positive Widal reaction?

R A BUTLER M D, Safety Harbor, Fla

ANSWER—The Widal reaction may persist at low levels for years after an attack of typhoid or after vaccination with killed typhoid bacilli. The agglutinin titer usually reaches its height, sometimes over 1:1,280, about two weeks after the last injection of vaccine, and then in the average case first diminishes rather rapidly for several months and at a slower rate thereafter. It is not at all uncommon to find a low titer of 1:40 or 1:80 for several years. During this time any intercurrent infection or vaccination against some other disease may cause a temporary increase in the titer which is sometimes referred to as an anamnestic reaction. Such an occurrence is often confusing in making diagnoses.

A Widal titer of 1:40 is not high enough to be of significance in making a diagnosis of typhoid. In the case referred to it is highly probable that the atypical pneumonia or possible bronchiectasis was responsible for the presence of the Widal reaction.

SOLUTIONS OF COMMON SEDATIVES

To the Editor—I should like full information concerning the preparation of sterile stock solutions of the common sedatives such as soluble phenobarbital and sodium amylal. I have tried autoclaving such solutions, only to have the powder precipitate as a solid cake. Why? Would autoclaving the dry powder and then dissolving it with aseptic technique solve the problem? Should the solution be passed through an Arnold sterilizer? What is the effect of heat on the solution? How long would such solutions keep in bottles in the wards? M D, District of Columbia

ANSWER—Barbituric acid and its many derivatives, which are used as sedatives and hypnotics, are not acids in the true sense of the word. They do form soluble salts when combined with the alkali metals. These salts are combinations of a weak "acid" and a strong base and as such are unstable when in solution. When such solutions are subjected to boiling or to autoclaving or are allowed to stand for some time, hydrolysis takes place. In the case mentioned, the hydrolysis liberates the free barbituric acid derivative which is insoluble. This precipitates and forms the "cake."

A sterile solution could be prepared by heating the dry powder to about 125 C for some time. (The United States Pharmacopeia directs that the powdered soluble phenobarbital is to be heated for six hours at 140 C in preparation for analysis.) This could be dissolved in sterile water under aseptic technique. No further treatment of the solution is necessary.

The question as to how long such solutions would keep in bottles in the wards is difficult to answer. The U S Pharmacopeia states that aqueous solutions of soluble barbiturates are alkaline in reaction and are unstable. Several experiments with buffer solutions were tried, but the solutions either became cloudy or precipitated on standing. One pharmaceutical house has a solution of a soluble barbiturate derivative on the market.

This is dissolved in ethylene glycol and hence is not suitable for intravenous use. The fact that soluble barbiturate derivatives are marketed dry in ampules, to be put into solution with sterile water just before use, is evidence of the difficulties in preparing stable solutions of the soluble barbiturate derivatives.

BLEPHARITIS FROM MONILIA

To the Editor:—I have a patient who is afflicted with chronic blepharitis caused by *Monilia albicans*. His refractive error, practically negligible, has been corrected. Is there any specific treatment for blepharitis moniliasis? What is the prognosis?

M.D., Connecticut.

ANSWER.—It would seem that blepharitis due to *Monilia albicans* is an exceedingly rare condition or at least that it is practically never recognized as such by ophthalmologists. No recommendations for treatment have been found in the literature. The logical treatment would seem to be the use of one of the drugs employed in treating monilia infections of the skin and mouth. Soaking the lids with a moist pack of 5 per cent sodium thiosulfate would be safe and might prove of value. The use of sodium thiosulfate in a 2 per cent ointment would offer another method of application. If there is also conjunctival infection, a 1 or 2 per cent solution of sodium thiosulfate would not damage the cornea. It is likely that the more commonly employed ointments, such as 2 per cent yellow mercuric oxide or 3 per cent ointment of ammoniated mercury might be of value as in other forms of blepharitis, provided the crusts are first removed with an applicator soaked in 3 per cent sodium bicarbonate.

INJURY TO RAMUS COMMUNICANS

To the Editor:—What effect has injury to the ramus communicans in the region of the twelfth dorsal and first lumbar vertebrae on the stomach? Would any chronic disturbance result? How?

M.D., New York.

ANSWER.—It is doubtful that an injury to the ramus communicans in the region of the twelfth dorsal and first lumbar vertebrae would have any great effect on the stomach itself. The efferent innervation to the stomach is from the vagus and the white rami from the fifth to the twelfth thoracic nerves through the sympathetic trunk without interruption, to the celiac ganglion, celiac plexus and in the musculature of the stomach. The location of the injury mentioned may result in changes in the large bowel and produce a chronic disturbance in this region by interrupting the synapse. This disturbance may be in the form of increased irritability of the bowel resulting from lack of inhibitory control.

LIVER EXTRACT FOR PSORIASIS

To the Editor:—A patient of mine suffering from psoriasis has called to my attention the recently published treatment for this disease by means of liver extract. I will appreciate any information you can give me on this question. The patient is a married woman of 25, apparently healthy in all other respects, has had psoriasis for about twelve years, and the only effective treatment so far has been ultraviolet exposures and the application of Dr. White's crude tar ointment. However, as soon as treatment is stopped, the lesions tend to recur.

STANLEY Z. WEISSHAUS, M.D., New York.

ANSWER.—Liver extract, like innumerable other injections, has been used with variable and indifferent results in the treatment of psoriasis. The use of crude coal tar ointment plus ultraviolet rays as described by Goeckerman (*Northwest. Med.* 24:229 [May] 1925; *Arch. Dermat. & Syph.* 24:446 [Sept.] 1931) is a good method of treatment when used persistently.

APPENDICAL ABSCESS

To the Editor:—I read on page 464 of THE JOURNAL for February 4, a query from Dr. Raymond H. McPherron of Chicago on the opening of an appendical abscess extraperitoneally. I felt that Dr. McPherron, in following up this idea, might be further interested in the principle of chemotaxis as applied to drainage in these cases, which principle has, I believe, been life saving in my hands and, I also believe, a subject much overlooked in the literature as well as in practice, in spite of the fact that it has been in use and attention has been called to it on numerous occasions by various authors. I submit here a few references on that subject, which I hope will be of value:

Eastman, J. R.: Prevention of Peritoneal Contamination in Drainage of Abdominal Abscess, *THE JOURNAL*, March 24, 1923, p. 833. (This article refers to similar work by A. J. Ochsner.)

McCutcheon, Morton; Wartman, W. B., and Dixon, H. M.: Chemotropism of Leukocytes in Vitro, *Arch. Path.* 17: 607 (May) 1934.

Schuster, D.: Experimental Studies of Local Bacterial Processes of Inflammation, Especially of Chemotaxis, *Mitt. a. d. Grenzgeb. d. Med. u. Chir.* 36: 441, 1923.

Benoist, E. E.: Maintenance of Relative Asepsis in Abdominal Surgery, *Mississippi Doctor*, November 1936, p. 41.

E. E. BENOIST, M.D., Natchez, Miss.

Council on Medical Education and Hospitals

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Thirty-Fifth Annual Meeting, held in Chicago, Feb. 13 and 14, 1939

(Continued from page 1414)

DR. JULIAN F. DU BOIS, Sauk Centre, Minn., in the Chair

THE FEDERATION OF STATE MEDICAL BOARDS

FEBRUARY 14—AFTERNOON

Looking at Health Insurance Abroad

MR. J. GEORGE CROWNHART, Madison, Wis.: As we discuss compulsory sickness insurance this afternoon we must keep uppermost in mind that, in the final analysis, we are talking about the care of individuals.

As I traveled the state of Wisconsin with a committee during the last eighteen months, going into some thirty-nine counties, sitting day after day with people from all walks of life and talking to them about their health and the health of their friends, I was impressed particularly with the fact that health problems frequently differed from county to county and even within counties. I would leave that as a background for our discussion.

The examination of sickness insurance abroad was undertaken in the sense of "Is the legislation in any one country, as it stands or with some modification, something that can be taken back and applied in Wisconsin to provide more people with a better sickness and health service?"

After completing the study, I was conscious of the fact that in England, Norway, Sweden, Denmark, Germany and France certain factors are common to the system regardless of whether the laws differ in their actual writing. I should like to discuss some of the elements which, one may fairly assume, are inherent to practice under compulsory sickness insurance.

First, the legislature establishes the premium. It says "This is the amount of money that we must raise for each person who is insured." Every pay check abroad, no matter how small, is taxed under compulsory sickness insurance. Persons under income limits that here would entitle them to receive service, without themselves contributing to it, abroad help the government to finance this service for themselves. Then the employer makes his contribution. Sometimes the government adds something, and sometimes it doesn't. But, regardless of that, in the initial legislation the premium is established. Now, I think that this would be all right were it not that physicians and medical science do not stand still. In the very time in which there has been compulsory sickness insurance abroad, the wide use of x-rays, first in diagnosis and then in therapeutics, has developed; insulin for diabetes, liver extract for pernicious anemia and other remedies have been discovered, and all of them initially cost more money. Socially they are cheap, but initially they require a greater outlay of funds than was anticipated at the time the legislation was passed. When small pay checks are being taxed, it is not politically expedient to increase that tax year after year. The administrator balances his books in the only way available to him by ignoring, for the great mass of his insured population, the steady advance of medical science.

Second, the fact that millions of dollars are involved does not mean that there is more money for each person who is not ill. Millions of dollars were involved in Wisconsin in poor relief. An effort was made to find out why more work could not be done in the prevention of illness for people who were receiving this government service. It was discovered that, despite the fact that there were millions, there was only about \$27 a month for each family of four for food, fuel, shelter, clothing, sickness care and health service.

The same principle holds in compulsory sickness insurance. Although millions are raised there is no more for each individual case of illness. Actually, there may be increasingly less from year to year. It is not known what the load is going to be, so most countries resort to the only thing possible

under the circumstances; they pin down the amount involved to make certain that their budget will be sufficient to cover the year, and they do it by making the physician the real insurer. They say, "Doctor, we now insure 50 per cent, 60 per cent, 80 per cent of the people in your community. Would you like to be part of the system?" Possibly he says yes. Then they say, as they do in England, "All right, we will pay you \$2.25 a year for each person who selects you as his family physician at the time he is insured." The selection is generally not made at the time the illness occurs, on the basis of the individual illness, but at the time the person enters the insurance system, so the physician becomes the real insurer. He has accepted the stipulated amount for an unknown amount of service during the year.

If the physician were left alone at that point, he could probably figure out some way of jumping those handicaps, but he isn't. The government is interested in what the physician does because it has to pay for that, too.

In each system there is the little book, in which is set forth that which the physician may do, having in mind economical prescribing. If one talks to a physician who has gone out beyond the book, he may say "I did prescribe drugs not in the book, but my patient wasn't getting along well, and I read of something that had passed beyond the experimental stage, and I tried it, and my patient is back to work, but now I must explain to the regional medical officer about a patient he never saw, of whose family history he knows nothing, and tell him why I went out of the book and prescribed the more expensive procedure. You understand, of course, that the extra cost is subtracted from my next quarterly pay check."

Then something else happens. These systems do not administer themselves any more than an insurance company administers itself. In England one must admire the wonderfully high concept of civil service, far surpassing our own. Yet under such ideal conditions one finds that the administrative cost, after it is broken down, is 17 cents of the sickness dollar. In other countries it is as low as 10 per cent and 12 per cent but, when it is broken down, one is not altogether convinced that all which here would be regarded as administrative costs have been included.

One is told at the International Labor Office at Geneva that to collect the money, to check on the employer to make certain he has made the proper deductions, to check on the person who is sick in his home for more than a normal time, to check (in England) the 66,000,000 prescriptions a year to see that the physician has stayed within the little book and the pharmacist has priced the drugs right, to check on the treatment that is being given to the patient who requires more than a normal period of hospitalization, and to administer the whole scheme requires a group of employees varying from one for every fifty to one for every hundred persons insured.

Something else is even more important. In the National Hospital at Oslo, Norway, and I choose that one hospital merely because it comes to mind, I was tremendously impressed with the work that was being done under the handicaps of an old institution, handicaps which I think to physicians in my own state would seem almost insuperable. Yet down the street is a modern seven story office building with every type of modern business equipment, and here the system is administered. As the observer goes through this building, he cannot forget the building in which the sick are being cared for. He is impressed by the fact that under these systems the administration takes a dominant role.

As one spends hour after hour with the administrators of these systems, one is impressed constantly by a certain attitude and asks oneself why it prevails. Finally the answer comes from the lips of the administrator, and it is repeated time and time again: "Not all our people are sick at one time, only 2 or perhaps 4 per cent. All we know is that last year we hardly had money enough to get through the year. These sick people have been paying their contribution out of every week's pay check, and 2 per cent seems a lot when the pay check is small. They have been paying over a long period and they want the benefits. I have a 96 or a 98 per cent unknown demand. I don't know what it will be before the year is over. I have no other source of money. It must come from what I have raised, and this amount must last. We have a surplus, not in

the vast amount that we think necessary, but at least a year's budget. So we must be watchful of our funds."

This attitude worries the observer, because the administrator, instead of assuming the role of guardian of the sick, becomes, as the years go by, more and more a trustee of money, and this conflicts with the concept of sickness care which prevails in our own country.

The regulations in Germany as well as in other countries contain a warning to the physician that, while in so-called private practice what he does is at the expense of the individual, under insurance practice it is at the expense of a third party.

An observer from the United States studying abroad finds creeping into the situation the hours of labor concept of legislation in Norway and the assignment of night calls exclusively to the young physician in Copenhagen, Denmark. He finds medicine in the role, whether it wishes to be there or not, of a salvager instead of the dynamic force, ever pushing back disease, that it is in the United States.

Then there is the overload on the physician. It is due in part to the fact that the amount that can be paid per person on the panel is so low that there must be a sufficient number on the panel to compensate and in part to the fact that, because the system is concerned even with pennies, the administrators would prefer that the physician limit his prescriptions in amount and that the patient go back three or four times, if need be, to have the prescription repeated instead of receiving a prescription for the full amount, in which case some of the medicine might be wasted. The overload does exist. The concept of sickness insurance to compile records on which further progress may be made in the prevention of disease is never realized. The concept of prevention in the sense of treating illness early is not found, because of the overload. It was not my observation that the physician abroad was any less humanitarian than the physician in my own state, but I was impressed that under rules and regulations he may find himself unable to do the thing that he is trained to do.

I spoke to an administrator in one country about the possibility of having periodic health examinations. I said "It seems to me, from my work on the governor's committee in Wisconsin, that over a period of years these would be the cheapest method, entirely aside from the humanitarian aspect in the care of the sick." "Well," he said, "that might be so. Undoubtedly it would over a long period, but how could we do it? We are swamped now by our demands. Are you suggesting that we should uncover more demands? Such a situation would be hopeless, from our point of view."

On my second visit to Oslo, it had just been determined to extend the sickness insurance downward from the age of 16 to 14. The medical association there had asked for the school medical record to be sent to the physician of choice for those who were then to be insured at the age of 14. It was explained that this couldn't be done because the school record was on a card that was one fourth inch too wide for the sickness insurance envelop but that, if the physician who wanted the record would write to the teacher of the school involved, a copy could be had at such times as he might wish it. Under these systems even the size of records become of commanding importance.

The effect extends beyond the insured. I quote from the report on British health services: "The nation needs sickness services, but a nation which regards them as a substitute for health services is going to find the confusion expensive in money and suffering. . . . It is no less necessary for those concerned with national health to examine the diseases of insurance schemes than it is to study heart disease and cancer."

There is a social purchase price for whatever economic security is involved in compulsory sickness insurance: 1. It is sold as a social service, but its operation as an insurance plan defeats this end. 2. It is sold in its preventive aspects, but its budget and operations reduce medical practice to the role of salvage. 3. Its beneficent intent is accepted as a guaranty of a quality of service that it is increasingly impossible to render. 4. To insure a balanced budget requires a control over the service that is rendered the sick, and that control is exercised in every country and not in accordance

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School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine....	(1917),		
(1934) Dist. Colum.			
Georgetown University School of Medicine.....	(1934)	Dist. Colum.	
Howard University College of Medicine.....	(1937)	Tennessee	
Indiana University School of Medicine.....	(1930), (1937)	Indiana	
University of Louisville School of Medicine.....	(1936)	Kentucky	
Louisiana State University Medical Center.....	(1938)	Louisiana	
Johns Hopkins University School of Medicine.....	(1934), (1937)	Maryland	
University of Michigan Medical School.....	(1936)	Penna.	
St. Louis University School of Medicine.....	(1937)	Missouri	
New York University College of Medicine.....	(1935)	New Jersey	
Ohio State University College of Medicine.....	(1923)	Ohio	
University of Cincinnati College of Medicine.....	(1938)	Ohio	
Temple University School of Medicine.....	(1937)	N. Carolina	
Mellary Medical College.....	(1937)	Tennessee	
University of Tennessee College of Medicine.....	(1932)	Tennessee	
Medical College of Virginia.....	(1935)	New Jersey	
University of Virginia Department of Medicine.....	(1937)	New Jersey	
University of Wisconsin Medical School.....	(1932)	Wisconsin,	
(1933) California			
University of Toronto Faculty of Medicine.....	(1929)	New York	

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad.	of
George Washington University School of Medicine....	(1936)	N. B. M. Ex.	
Jefferson Medical College of Philadelphia.....	(1935)	N. B. M. Ex.	
University of Texas School of Medicine.....	(1924)	U. S. Navy	

* Licensed to practice osteopathy and surgery.

Book Notices

Insulin: Its Chemistry and Physiology. By Hans F. Jensen, Ph.D., Associate, Laboratory for Endocrine Research, The Johns Hopkins University, Baltimore. Cloth. Price, \$2. Pp. 252. New York: Commonwealth Fund; London: Oxford University Press, 1938.

In preparing this monograph on insulin, Dr. Jensen has performed a valuable service, particularly to those workers interested in diabetes and in investigations concerning carbohydrate metabolism. He has thoroughly reviewed the important literature up to 1938. To indicate the completeness of the work, one needs only to mention that, in the bibliography appended to the chapter on the physiologic action of insulin alone, 624 references are cited. Although the emphasis throughout is placed on the chemistry and physiologic action of insulin, sufficient reference to clinical application is made to make the work interesting and valuable for the clinician. Every doctor treating diabetic patients would profit by reading the introductory paragraph to chapter 6 on insulin substitutes. Among other statements the following excellent advice is given:

An appreciable number of substances exist which will depress the blood sugar level in animals. More careful work has generally shown that, in spite of the superficial similarity in effect, the physiological action of these compounds is quite different from that exhibited by insulin itself. It is therefore obvious that every new insulin substitute should first be carefully studied in normal and depancreatized animals before its clinical trial on diabetic patients is attempted.

As a result of investigative work which is constantly in progress, our knowledge regarding carbohydrate metabolism, the action of insulin and related topics is always in a state of flux. Consequently it is desirable that from time to time new summaries be written. The monograph by Dr. Jensen can be thoroughly recommended.

Clinical Laboratory Methods and Diagnosis: A Textbook on Laboratory Procedures with Their Interpretation. By R. B. H. Gradwohl, M.D., Director of the Gradwohl Laboratories and Gradwohl School of Laboratory Technique, St. Louis, Mo. Second edition. Cloth. Price, \$12.50. Pp. 1,607, with 536 illustrations including 44 color plates. St. Louis: C. V. Mosby Company, 1938.

This edition has been thoroughly revised and brought down to date. Each chapter contains enough of physiology and pathology for comprehension and interpretation of the tests that are mentioned. In the preface Gradwohl states that more than 100 pages have been added to the chapter on hematology, that complete data on the theories of blood development are given and that twenty-four color plates have been added. The views of several authorities are always included; footnote references to printed matter are abundant. The entire section on hemithol-

ogy was written by Prof. Pedro Kouri of Havana, Cuba. Besides the customary chapters on each division of routine laboratory work, this book contains several interesting chapters on postmortem examinations, toxicologic technic and detection of crime by laboratory methods. This is valuable information for the rare occasions when even the smallest laboratory is called on to trace a questionable cause of illness or death. The manner of presentation is clear and interesting. The least doubt or confusion which may arise in the reader's mind is at once clarified by an example. Several approved tests for each determination are given. Technic is presented to the most minute detail. Preparation of reagents and equipment for each test are included with the test. The volume is somewhat bulky and rather expensive. Nevertheless it is an excellent textbook for technicians. It is particularly recommended for hospital laboratories and for physicians with private laboratories.

Untersuchungsmethoden für Arzneispezialitäten. Zusammengestellt von der Spezialitäten-Kommission des Internationalen Apothekerbundes. Second edition. Boards. Price, 3.50 florins; 5 marks. Pp. 148, with 10 illustrations. Leyde: Fédération Internationale pharmaceutique; Amsterdam: Dekker en Nordemann N. V., 1938.

This edition is greatly improved. Besides the general technical methods, numerous specific determinations of chemical entities are given and clearly arranged in table form. Micro methods were used whenever they were found to be superior to the time and material consuming conservative standards. Many chemical assays of newer therapeutics are taken from New and Nonofficial Remedies. The committee members must be thanked for their enormous effort to place such a timely book of practical and precise analytic procedures in pharmaceutical chemistry again into the hands of international, private and government agencies connected with the enforcement of food, drug and cosmetic laws.

Maternity Care in a Rural Community, Pike County, Mississippi, 1931-1936. By Maxwell E. Lapham, M.D., Assistant Professor of Obstetrics, School of Medicine, the Tulane University of Louisiana, New Orleans. Paper. Price, 25 cents. Pp. 65. New York: Commonwealth Fund, 1938.

This is part of a stock taking of a public health program established in Pike County, Miss., in 1931 with the assistance of the Commonwealth Fund. Attention is focused on maternal mortality, which was 5.3 and 9.4 per thousand live births for white persons and Negroes respectively. "In regard to the Negro maternal deaths, it seems likely that the relatively poor economic conditions under which the patients lived caused a lowered resistance and greater tendency to develop some of the common conditions causing death, such as infection and toxemia." While, on the basis of an analysis which it is stated should be clearly understood as "in part speculative," it was determined that a certain percentage of the maternal deaths were due to "neglect and failure to obtain medical care on the part of the patient or midwife, and possibly ill advised interference on the part of the physician. . . . nearly half of the controllable deaths were due to neglect on the part of the patient or the patient's family." A suggested maternity program gives specific suggestions for the improvement of medical, midwife and nursing service.

Forelæsningsnoter over klinisk Endokrinologi og beslægtede Emner. Første Række. Af Herman Nielsen. [Lectures on Clinical Endocrinology and Related Subjects. First Series.] Paper. Price, 12.50 kroner. Pp. 192, with 38 illustrations. Copenhagen: Levin & Munksgaard, 1938.

This monograph presents a series of clinical lectures on endocrinology and related conditions presented before university medical students. It comprises a clinical description of acromegaly, diabetes insipidus, adrenal disorders, Addison's disease, Cushing's syndrome, the climacteric, Paget's disease, scleroderma, Hand-Schüller-Christian disease, xanthomatosis and related disturbances in lipid metabolism. The clinical descriptions are remarkably clear and usually from patients presenting the symptom complex under discussion. The illustrations are a distinct addition to the text. A familiarity with the published literature is equally evident. The chapter on xanthomatosis and the reticulo-endothelial system adds a new interest to the xanthoma problem. It emphasizes the principle that the xanthoma cell is a cell of the reticulo-endothelial system infiltrated with lipoids. The various manifestations of

xanthomatosis are regarded as expressions of disturbed lipid and cholesterol metabolism. Of the many monographs that have appeared on clinical endocrinology, this is one of the most attractive and informative that have been published.

A Textbook of Histology: Functional Significance of Cells and Inter-cellular Substances. By E. V. Cowdry, Professor of Cytology in the School of Medicine, Washington University, St. Louis, Mo. Second edition. Cloth. Price, \$7. Pp. 600, with 323 illustrations. Philadelphia: Lea & Febiger, 1938.

This edition has been enlarged by a hundred pages, and many new figures have been added. These should aid the student to understand more completely the sections he studies under the microscope. An introduction, partly historical, is intended to orient the students in their study. In various ways, such as directions for the examination of fresh tissues, the book has been improved for use as a laboratory guide. But these additions are not enough to make the study of histology easy for the average student. Freshman medical students probably need more explicit descriptions and guides than this textbook provides. This book should probably be supplemented in the laboratory by a small guide, such as Schaffer's. The great importance of the book, however, is that it heralds a new era in medical textbooks. It is a pioneer of the textbooks of the future. The author attempts (1) to present the subject of histology as a field in which progress is being made daily, (2) to awaken the student's intellectual curiosity to the problems which this subject presents, and (3) to initiate the student into that correlation of facts from many fields of investigation which will prove most useful to him in his later medical work. He carries out the first two aims by discussing both sides of controversial questions, with liberal extracts from the recent literature. The third aim is aided by tables, in which the significant anatomic and physiologic characteristics of tissues and organs are briefly enumerated. Whether the book will succeed in this threshold attempt, as well as impart the necessary histologic facts to the average medical student, is doubtful. It should be highly stimulating to teachers of the subject and to the more intellectually qualified medical students.

Nursing Care of Communicable Diseases: Prophylactic Technics for the Prevention and Control of Disease. By Mary Elizabeth Pillsbury, R.N., M.A. With a chapter on Fungous Diseases. By Grace Maguire Swanner, M.D. And a Brief Picture of Public Health Nursing. By Mary E. Edgecomb, R.N., Science Adviser: Jean Broadhurst, Ph.D., Professor of Bacteriology, Teachers College, Columbia University, New York City. Fifth edition. Cloth. Price, \$3. Pp. 603, with 137 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1938.

There is assembled in this edition an unusual amount of valuable information. The scope of the subject is broad; the material is concise and well arranged. Part I, which comprises approximately one third of the volume, contains chapters every nurse should read. The importance and technic of medical asepsis are emphasized. Cause, mode of transmission and resistance to disease are discussed. The functions of the nurse in disease control and measures for public health control are outlined. Prophylactic technic for the nurse and methods for establishing immunity against various infections are set forth. Part II relates to a large number of the better known communicable diseases and gives specific instructions regarding the nursing care of each. In part III is found miscellaneous information, which includes a historical review of the care of communicable diseases. The value of the book is enhanced by illustrations and charts. It should be of great assistance not only to the nurse in training but to the graduate and to the medical student as well. For one who contemplates entering the field of public health this treatise will prove to be a splendid acquisition.

La amibiasis en Chile. Por el Dr. Amador Neghme Rodriguez, jefe de laboratorio de la cátedra de parasitología, Santiago. Paper. Pp. 48, with illustrations. Santiago: Imp. el Imparcial, 1938.

In this monograph one will find a brief summary of the most commonly known literature on amebiasis and the results of the author's observations on amebiasis in Chile. After more than two years of study on cultural methods and after devising a new modification, he has concluded that culturing *Endamoeba* is more of scientific interest than of practical use. After discussing briefly some well known facts concerning the

epidemiology of amebiasis, he gives the results of studies made in Chile during the years 1934 to 1937 inclusive. Two hundred and eighty-five patients were examined in the laboratory of parasitology of the school of biology and medical sciences. Forty-three (50.08 per cent) harbored *Endamoeba histolytica* (the author prefers the term *E. dysenteriae*). In the Hospital del Salvador there were 827 patients examined in 1937 and 11.36 per cent were infected with *E. histolytica*, while in other hospitals the rates of infection varied from 7.67 per cent to 11.26 per cent. Among 790 soldiers examined the rates varied from 2.7 to 10.12 per cent. The author has infected cats with cultures of amebas by rectal inoculation as well as by inoculation directly into the ileum, both before and after splenectomy.

Virus Diseases and Viruses. By Sir Patrick P. Laidlaw, M.A., B.Ch., F.R.C.P. The Rede Lecture 1938. Boards. Price, 90 cents; 2s. 6d. Pp. 52. New York: Macmillan Company, Cambridge: University Press, 1938.

This brief "lecture" on virus diseases and viruses represents some of the views of one of the most distinguished contributors in the field. Perhaps its most important aspect is the author's theory on the origin of viruses, which is entitled to receive the careful attention of workers in the field.

Have You Had Your Vitamins? By Harry N. Holmes, Ph.D. Cloth. Price, \$1. Pp. 60, with 3 illustrations. New York & Toronto: Farrar & Rinehart, Inc., 1938.

Written by a distinguished professor of chemistry at Oberlin College, this little book is intended for the intelligent housewife and "others interested in vitamin therapy." Those persons who feed vitamin pills to their families will find plenty of support in the "conservative advice" of the author. With the unfortunate publicity that shotgun vitamin mixtures are receiving it would seem that the advice in this book is superfluous.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Atrophy of Optic Nerve Attributed to Exposure to Heat and Glare of Furnace.—For about ten years the workman in this case had been employed by the defendant petroleum company to fire furnaces and boilers. On May 28, in adjusting a valve on a particular boiler, he was forced to look at the flame for five minutes to adjust the flame to a target in the boiler, a task he had performed many times before. Thereafter he became blind and instituted suit under the workmen's compensation act of Louisiana. The trial court gave judgment against the workman and he appealed to the court of appeal of Louisiana, first circuit.

The evidence before the trial court showed that the workman had had syphilis for several years before the incident to which he attributed the loss of his sight and that his vision had been impaired. A physician who had examined the workman about fourteen months after the alleged industrial accident testified that he found him suffering from an advanced stage of neurosyphilis and that the optic nerve was atrophied. There was medical evidence to the effect that syphilis is the principal cause of atrophy of the optic nerve, although it is not the sole cause. Medical experts testified that heat and glare, without some severe burns around the eyes, would not cause atrophy of the optic nerve and that exposure to heat and glare in firing a boiler would not affect or aggravate a syphilitic condition so far as it relates to the optic nerve. If, said the court of appeal, the glare and heat from the boiler or furnace served to aggravate or hasten the atrophy of the optic nerve because of the weakened condition of the nerve brought on by syphilis, and if this heat and glare on that particular day was unusual and out of the ordinary routine of the day's work, it could be said that the heat and glare from the boilers had a causal connection with the blindness, and the workman would be entitled to compensation. There was, however, no evidence to this effect. On

the contrary, the evidence showed that the atrophy of the optic nerve and the resulting blindness were caused by syphilis, not by the exposure of the workman to the heat and glare of the boilers. The workman therefore failed to show that his disability was caused or superinduced by an accident or injury in the course of his employment. The judgment in favor of the employer was accordingly affirmed.—*Laughlin v. Magnolia Petroleum Co. (La.)*, 182 So. 178.

Insanity: Constitutionality of Statute Authorizing Court to Appoint Commission to Determine Sanity.—Noelke was prosecuted for the murder of his wife and infant daughter. He entered pleas of not guilty and of insanity. In accordance with an Indiana statute, which provides that when an insanity defense is pleaded the court shall appoint two or three competent disinterested physicians to examine the defendant and testify at the trial, the trial court appointed three physicians to examine Noelke and testify as to his sanity. At the trial the three physicians were permitted to testify, over Noelke's objection, that, from their examinations and observations, they were of the opinion that he was of sound mind. From a conviction of murder in the first degree, Noelke appealed to the Supreme Court of Indiana.

Noelke contended that the statute was unconstitutional in that the effect of the testimony of these physicians as to his sanity, based on their observation and examination of him, was to compel him to testify against himself contrary to the constitution of Indiana, which provides: "No person, in any criminal prosecution, shall be compelled to testify against himself." The Supreme Court, however, cited several court decisions holding that testimony by a medical expert as to sanity, based on his observation and examination, is competent and does not amount to compelling an accused to give evidence against himself. Witnesses appointed by the court to examine and observe a person who is accused of a crime and who has filed a plea of insanity affords the court and jury testimony as free from influence and prejudice as is humanly possible to obtain. Such examinations by experts must be confined within constitutional limitations. In the judgment of the court, no constitutional right of Noelke had been violated and the judgment of conviction was affirmed.—*Noelke v. State (Ind.)*, 15 N. E. (2d) 950.

Society Proceedings

COMING MEETINGS

American Medical Association, St. Louis, May 15-19. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

Alabama, Medical Association of the State of, Montgomery, April 18-20. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.

American Academy of Tuberculosis Physicians, St. Louis, May 13-14. Dr. Arnold Minnig, 638 Metropolitan Bldg., Denver, Secretary.

American Association for the Study of Goiter, Cincinnati, May 22-24. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.

American Association for Traumatic Surgery, Hot Springs, Va., May 8-9. Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.

American Association of Genito-Urinary Surgeons, Williamsburg, Va., May 24-26. Dr. Charles C. Higgins, 2050 East 93d St., Cleveland, Secretary.

American Association of Industrial Physicians and Surgeons, Cleveland, June 5-8. Dr. V. S. Cheney, Armour and Company, Union Stock Yards, Chicago, Secretary.

American Association of the History of Medicine, Atlantic City, N. J., April 30-May 1. Dr. Henry E. Sigerist, 1900 Monument St., Baltimore, Secretary.

American Association on Mental Deficiency, Chicago, May 3-6. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.

American Bronchoscopic Society, Rye, N. Y., May 26. Dr. Lyman B. Smith, 210 Longwood Ave., Boston, Secretary.

American Association of University of Pennsylvania Medical Laboratories, Philadelphia, Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., May 1-2. Dr. Russell S. Boles, 1901 Walnut St., Philadelphia, Secretary.

American Gynecological Society, White Sulphur Springs, W. Va., May 22-24. Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.

American Heart Association, St. Louis, May 12-13. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.

American Laryngological Association, Rye, N. Y., May 24-26. Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.

American Laryngological, Rhinological and Otolological Society, Chicago, May 10-11. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Medico-Legal Association, Chicago, May 12-13. Dr. Michel Pijoan, 124 Commonwealth Ave., Boston, Secretary.

American Neurological Association, Atlantic City, N. J., June 5-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.

American Orthopedic Association, Buffalo, N. Y., June 5-8. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.

American Otolological Society, New York, May 22-23. Dr. Thomas J. Harris, 104 East 40th St., New York, Secretary.

American Pediatric Society, Sky Top, Pa., Apr. 27-29. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.

American Physiological Society, Toronto, Canada, Apr. 26-29. Dr. A. C. Ivy, 303 East Chicago Ave., Chicago, Secretary.

American Psychiatric Association, Chicago, May 8-12. Dr. Arthur H. Ruggles, Butler Hospital, Providence, R. I., Secretary.

American Rheumatism Association, St. Louis, May 15. Dr. Loring T. Swaim, 372 Marlborough St., Boston, Secretary.

American Radium Society, St. Louis, May 15-16. Dr. Frederick W. O'Brien, 465 Beacon St., Boston, Secretary.

American Society for Clinical Investigation, Atlantic City, N. J., May 1. Dr. Isaac Starr, University of Pennsylvania Hospital, Philadelphia, Secretary.

American Society for Experimental Pathology, Toronto, Canada, April 26-29. Dr. Paul R. Cannon, Dept. of Pathology, University of Chicago, Chicago, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Toronto, Canada, Apr. 26-29. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.

American Society for the Study of Allergy, St. Louis, May 15-16. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.

American Society of Biological Chemists, Toronto, Canada, Apr. 26-29. Dr. C. G. King, Univ. of Pittsburgh, Dept. of Chemistry, Pittsburgh, Secretary.

American Society of Clinical Pathologists, St. Louis, May 12-14. Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.

American Surgical Association, Hot Springs, Va., May 11-13. Dr. Charles G. Mixer, 319 Longwood Ave., Boston, Secretary.

American Therapeutic Society, St. Louis, May 12-13. Dr. Joseph F. Elward, 1726 Eye St. N.W., Washington, D. C., Secretary.

American Urological Association, White Sulphur Springs, W. Va., May 29-June 1. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.

Arkansas Medical Society, Hot Springs National Park, May 8-10. Dr. W. R. Brookshier, 602 Garrison Ave., Fort Smith, Secretary.

Associated Anesthetists of the United States and Canada, St. Louis, May 15. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary.

Association for the Study of Internal Secretions, St. Louis, May 13-14. Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.

Association of American Physicians, Atlantic City, N. J., May 23. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.

Association of Military Surgeons of the United States, Washington, D. C., May 8-10. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

California Medical Association, Del Monte, May 1-4. Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.

Connecticut State Medical Society, New Haven, May 25-26. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.

District of Columbia, Medical Society of the, Washington, April 25-27. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Executive Secretary.

Federation of American Societies for Experimental Biology, Toronto, Canada, Apr. 26-29. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.

Florida Medical Association, Daytona Beach, May 1-3. Dr. Shaler Richardson, 111 W. Adams St., Jacksonville, Secretary.

Georgia, Medical Association of, Atlanta, Apr. 25-28. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

Illinois State Medical Society, Rockford, May 2-4. Dr. H. M. Camp, 224 S. Main St., Monmouth, Secretary.

Iowa State Medical Society, Des Moines, Apr. 25-27. Dr. Robert L. Parker, 3510 Sixth Ave., Des Moines, Secretary.

Kansas, Medical Society, Topeka, May 1-4. Mr. C. G. Munns, 112 W. 6th St., Topeka, Executive Secretary.

Louisiana State Medical Society, Alexandria, Apr. 24-26. Dr. F. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 25-26. Dr. Walter Dent Wise, 1211 Cathedral St., Baltimore, Secretary.

Massachusetts Medical Society, Worcester, June 6-8. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.

Minnesota State Medical Association, Minneapolis, May 31-June 2. Dr. B. B. Souster, 11 West Summit Ave., St. Paul, Secretary.

Mississippi State Medical Association, Gulfport, May 9-11. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.

National Gastroenterological Association, New York, June 1-2. Dr. G. Randolph Manning, 1819 Broadway, New York, Secretary.

Nebraska State Medical Association, Grand Island, May 2-4. Dr. R. B. Adams, 414 Federal Securities Bldg., Lincoln, Secretary.

New Hampshire Medical Society, Manchester, June 8-9. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, June 6-8. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.

New Mexico Medical Society, Gallup, May 11-13. Dr. L. B. Cohenour, 219 W. Central Ave., Albuquerque, Secretary.

New York, Medical Society of the State of, Syracuse, April 24-27. Dr. Peter Irving, 2 East 103d St., New York, Secretary.

New York State Association of Public Health Laboratories, Valhalla, May 8. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.

North Carolina, Medical Society of the State of, Cruise to Bermuda, May 9-14. Dr. T. W. M. Long, Roanoke Rapids, Secretary.

North Dakota State Medical Association, Fargo, May 8-10. Dr. Albert W. Skelsey, 20½ North Broadway, Fargo, Secretary.

Ohio State Medical Association, Executive Secretary, Toledo, May 3-4. Mr. C. S. Nelson, 79 E. State St., Columbus, Secretary.

Oklahoma State Medical Association, Oklahoma City, May 1-3. Dr. L. S. Willour, Third and Nineteenth, McAlester, Secretary.

Rhode Island Medical Society, Providence, June 7-8. Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary.

Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., Apr. 29. Dr. W. C. Spain, 116 E. 53d St., New York, Secretary.

Society of Surgeons of New Jersey, Elizabeth, May 31. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

South Dakota State Medical Association, Aberdeen, Apr. 24-26. Dr. Clarence E. Sherwood, Madison, Secretary.

Texas, State Medical Association of, San Antonio, May 8-11. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Physiology, Baltimore

125: 205-414 (Feb.) 1939. Partial Index

- Role of the Thyroid in the Carbohydrate Disturbance Which Follows Hypophysectomy. S. Soskin, R. Levine and R. E. Heller, Chicago.—p. 220.
- Decreased Resistance to Hypoglycemia on Successive Days of Administration of Insulin. W. C. Corwin, Rochester, Minn.—p. 227.
- Intramyocardial Pressure and Its Relation to Aortic Blood Pressure. J. R. Johnson and J. R. Di Palma, Brooklyn.—p. 234.
- Thyroid Stimulation by Cold, Including the Effect of Changes in Body Temperature on Basal Metabolism. G. C. Ring, Boston.—p. 244.
- Effects of Preganglionic Denervation on the Superior Cervical Ganglion. A. Rosenbluth and W. B. Cannon, Boston.—p. 276.
- Some Chemical and Physiologic Properties of the Gonadotropic Antagonist. C. A. Bunde and A. A. Hellbaum, Oklahoma City.—p. 290.
- Plasma Prothrombin Levels in Various Vertebrates. E. D. Warner, K. M. Brinkhous and H. P. Smith, Iowa City.—p. 296.
- Vasoconstriction in the Hand from a Deep Inspiration. M. G. Mulinos and I. Shulman, New York.—p. 310.
- Acute Riboflavin Deficiency in the Dog. H. R. Street and G. R. Cowgill, New Haven, Conn.—p. 323.
- Reproductive Performance of Albino Rats with Previous Vitamin A Depletion Histories. L. G. Browman.—p. 335.
- Function of Muscles in Locomotion. H. Elftman, New York.—p. 357.
- Gonadotropic Content of Hypophysis Throughout the Life Cycle of the Normal Female Rat. H. D. Lauson, June B. Golden and E. L. Sevringhaus, Madison, Wis.—p. 396.
- Physiologic Action of Natural and Artificial Radioactivity. J. G. Hamilton and G. A. Alles, Berkeley, Calif., and San Francisco.—p. 410.

American Journal of Public Health, New York

29: 1-94 (Jan.) 1939

- The National Health Conference and the Future of Public Health. A. J. Altmeyer, Washington, D. C.—p. 1.
- Attitude of the American Medical Association Toward the National Health Program. I. Abell, Louisville.—p. 11.
- The Public Health Aspects of Medical Care: From the Standpoint of Public Health. C. E. A. Winslow, New Haven, Conn.—p. 16.
- *Questionable Value of Skin Testing as a Means of Establishing an Epidemiologic Index of Tuberculous Infection. L. L. Lumsden, W. P. Dearing and R. A. Brown, New Orleans.—p. 25.
- Preparation and Analysis of Diagnostic Antipneumococcus Serum. H. Welch, E. K. Borman and F. L. Mickle, Hartford, Conn.—p. 35.
- Pneumococcus Diagnostic Serum. E. S. Robinson, Boston.—p. 43.
- Is the Private Health Agency on the Way Out? B. Marquette, Cincinnati.—p. 46.
- Is There a Place for the Voluntary Health Agency in View of the New Public Health Activities of the Federal Government? H. E. Kleinschmidt, New York.—p. 49.
- The State Public Health Nursing Unit and Its Relation to Special Services. Jane D. Nicholson, Washington, D. C.—p. 55.
- Laboratory Administration as Regards Syphilis Serology. J. F. Mahoney and Margaret R. Harrison, Stapleton, Staten Island, N. Y.—p. 61.

Epidemiologic Index of Tuberculosis.—Lumsden and his associates question the value of cutaneous testing with tuberculin preparations based on an analysis of about 12,000 persons who were given tuberculin cutaneous tests. A purified protein derivative of tuberculin from two firms was used. School children were the first to be studied. Of 177 (4,400 children tested in two counties) white children ranging in age from 6 to 19 years at the first school tested only 14.7 per cent showed positive reactions. This percentage was surprisingly low in view of the much higher percentage of positive reactions reported by others. The authors' results were strikingly variable with different tuberculin which indicate to them that different preparations of tuberculin now used extensively by health agencies vary greatly in potency and/or specificity and signify that the percentage of positive reactors to cutaneous tests among school children, and inferentially among other general population groups, depends largely on the particular preparation of tuberculin used in making the tests. Satisfactory epidemiologic measurements cannot be made with such varying "yardsticks." The authors state that their observations appear to cast doubt not

only on the validity of recorded and exploited rates of sub-clinical tuberculous infection which have been established in different communities for the same period or in one community for different periods of time solely on a basis of results of cutaneous testing with different preparations of tuberculin but also on the significance of the observations in two or more communities tested at the same time, method, dosage and preparation of tuberculin. The results of tuberculin testing and those of x-ray study of the chests were far apart as epidemiologic indicators.

American Journal of Tropical Medicine, Baltimore

19: 1-96 (Jan.) 1939

- Malaria: Retrospect and Prospect. M. F. Boyd, Tallahassee, Fla.—p. 1.
- Comments on Some of the Unsolved Problems of Research and Disease Control in the Tropics. J. F. Siler, Washington, D. C.—p. 7.
- Failure of *Aedes Aegypti* to Transmit Yellow Fever Cultured Virus (17D). L. Whitman, Rio de Janeiro, Brazil, South America.—p. 19.
- Demonstration of Sporozoites in Human Tissues. M. F. Boyd and S. F. Kitchen, Tallahassee, Fla.—p. 27.
- Eight Year's Observations on Malaria in Panama. H. C. Clark and W. H. W. Komp, Panama, Republic of Panama.—p. 33.
- Infection of Mature and Immature Erythrocytes by *Plasmodium Falciparum* and *Plasmodium Malariae*. S. F. Kitchen, Tallahassee, Fla.—p. 47.
- Further Observations on the Duration of Immunity to the Homologous Strain of *Plasmodium Vivax*. M. F. Boyd and C. B. Matthews, Tallahassee, Fla.—p. 63.
- Observation on the Incubation Period of *Plasmodium Falciparum*. M. F. Boyd and C. B. Matthews, Tallahassee, Fla.—p. 69.

Endocrinology, Los Angeles

24: 1-136 (Jan.) 1939. Partial Index

- Sodium Pregnanediol Glucuronide: Significance of Its Excretion in the Urine. E. C. Hamblen, Catharine Ashley and Margaret Baptist, Durham, N. C.—p. 1.
- *Therapeutic Use of the Sex Sterols in Functional Menometrorrhagia. E. C. Hamblen, Durham, N. C.—p. 13.
- Progestin Studies: Pregnanediol Excretion. R. F. Stover and J. P. Pratt, Detroit.—p. 29.
- The Immature Rat Uterus in the Assay of Estrogenic Substances, and a Comparison of Estradiol, Estrone and Estriol. H. D. Lauson, C. G. Heller, June B. Golden and E. L. Sevringhaus, Madison, Wis.—p. 35.
- Atypical Uterine Growths Produced by Prolonged Administration of Estrogenic Hormones. W. O. Nelson, Detroit.—p. 50.
- The Specific Metabolic Principle of the Pituitary. L. W. Billingsley, D. K. O'Donovan and J. B. Collip, Montreal.—p. 63.
- Release of Colloid from Thyroid Gland by Centrifugal Force. J. F. McClellon, Minneapolis.—p. 82.
- Calorigenic Potency of Free Thyroxine by Mouth. W. O. Thompson, P. K. Thompson, S. G. Taylor 3d and L. F. N. Dickie, Chicago.—p. 87.
- Pseudosexual Precocity; the Adrenal Cortical Syndrome in Preadolescent Girls: Report of Successfully Operated Case. W. A. Reilly, H. Lissner and F. Hinman, San Francisco.—p. 91.
- Lactogenic Hormone: Severe Reactions from Its Use. A. A. Werner, St. Louis.—p. 119.

Sex Sterols in Menometrorrhagia.—Hamblen discusses a form of treatment which employs the cyclic administration of estrogen and progesterone or of progesterone alone. Observations were made on twelve patients with functional uterine bleeding. They received a total of forty-six series of treatments. During the period of treatments regular cyclic bleeding occurred and when the injections were discontinued none of the patients experienced a return of excessive bleeding. Some evidence is presented that these cyclic treatments alter the pathologic aberrations of the pituitary-ovarian-endometrial system, thereby overcoming theoretical ovarian and endometrial refractivity and the associated alterations in the gonadotropic effects of the pituitary. The method of treatment has been essentially as follows: A remission from bleeding is induced, if necessary, by estrogenic therapy or curettage. One week later, injections of estrogen in daily doses of from 10,000 to 20,000 international units are begun and continued for fourteen consecutive days. Progesterone is then given daily in doses of 5 international units for the next seven days. At the conclusion of this treatment, and frequently before it is finished, bleeding occurs. This has been found, as a rule, to be comparable in amount and in duration to that experienced by healthy women. No treatments are given during the week set aside for bleeding. Injections of progesterone are discontinued when bleeding begins. If these are continued, experience has been that excessive and prolonged bleeding often results. One week after the onset of bleeding, treatments are repeated in the same fashion. If bleeding lasts longer than seven days, injections of estrogens cause it to stop. Series of this combined therapy are given for from three to six months.

Journal of Urology, Baltimore

41: 1-102 (Jan.) 1939

- *Fused Kidney: Gross Pathologic Changes in Thirty-Five Cases. Rosemary Shoemaker and W. F. Braasch, Rochester, Minn.—p. 1.
- Pharmacology of Sulfanilamide. E. K. Marshall Jr., Baltimore.—p. 8.
- Sulfanilamide and Disulfanilamide Concentrations in Blood and Urine. E. P. Alyea, W. E. Daniel and Anne Yates, Durham, N. C.—p. 14.
- Experimental and Clinical Observations on Sulfanilamide in Urinary Infections. S. A. Vest, Justina H. Hill and J. A. C. Colston, Baltimore.—p. 31.
- Treatment of Gonococcal Infections with Sulfanilamide. J. I. Farrell, Chicago.—p. 44.
- Sulfanilamide in Treatment of Gonorrhea in the Male. C. R. O'Crowley, W. L. James and H. L. Sutton, Newark, N. J.—p. 51.
- Treatment of Urinary Infections in Children with Sulfanilamide. Pearl Summerfeldt and D. R. Mitchell, Toronto.—p. 59.
- Limitations, Dangers and Failures of Sulfanilamide in Treatment of Urinary Tract Infections. J. L. Crenshaw and E. N. Cook, Rochester, Minn.—p. 64.
- Sulfanilamide in Treatment of Acute Gonorrhea in the Male. H. A. Bogaev, E. T. Litt and D. M. Davis, Philadelphia.—p. 75.
- Growth of Neisseria Gonorrhoeae on the Chorio-Allantoic Membrane of Chick Embryo. Justina H. Hill and Anne C. Pitts, Baltimore.—p. 81.
- Possible Anatomic Relations Between Pituitary Body and Prostate Gland: I. Normal Pituitary Body. H. M. Jones, Rochester, Minn.—p. 84.
- Self Induction Analgesia with Nitrous Oxide for Urologic Examinations and Minor Procedures. H. H. Young, Baltimore.—p. 95.

Pathologic Changes in Fused Kidney.—Shoemaker and Braasch state that at the Mayo Clinic during the years from 1905 to April 1938 thirty-five instances of fused kidney were observed in the course of postmortem examinations. The incidence was 1:385 necropsies, which is higher than that of most authors (1:700). The advent of intravenous urography, however, has increased the incidence to about 1:200 persons (Gutierrez). In twenty-four cases the ureters, pelves and calices were normal except for their position in relation to the renal parenchyma. In eleven cases there was some degree of dilatation of the ureters, pelves or calices. In five of these eleven cases the dilatation was limited to the calices and pelvis and may be considered the result of the anomaly. There were eight cases of hypertrophy of the prostate gland and one of stricture of the urethra. In six of these there also was some dilatation of the upper part of the urinary tract. In four the dilatation was probably secondary to the obstructing lesion in the lower part of the urinary tract (prostatic hypertrophy in three cases and stricture of the urethra in one). Dilatation was secondary to a vesicocolonic fistula in another case. Pyelograms were made in only three cases. In two the possibility of fused kidney was suggested by pyelography but in another the diagnosis could not be made by this means. Sections were examined microscopically in twenty-one cases. Ten of these specimens appeared grossly normal. There were three cases of pyelonephritis (two with abscess formation). The remaining specimens were normal microscopically or pathologic changes were observed which would be found as often in anomalous as in normal kidneys. Coexistent congenital anomalies were present in eleven cases.

Laryngoscope, St. Louis

49: 1-68 (Jan.) 1939

- Annual Digest of the Literature of Tuberculosis in the Field of Otolaryngology: Abstract of the Literature of the Past Few Years. F. R. Spencer, Boulder, Colo.—p. 1.
- Bacteriology of Suppurative Meningitis. A. A. Eggston, New York.—p. 16.
- Differential Diagnosis of Otitic Meningitis. J. G. Dwyer, New York.—p. 21.
- Avenues of Infection of Otitic Meningitis. M. F. Jones, New York.—p. 23.
- Operative Treatment of Otitic Meningitis. W. C. Bowers, New York.—p. 26.
- *Chemotherapy in Meningitis Secondary to Ear and Sinus Infections. E. Appelbaum, New York.—p. 30.
- Surgical Treatment of Chronic Dacryocystitis: The Transseptal Approach. S. W. Garfin, Boston.—p. 46.
- Anesthesia in Peroral Endoscopy. F. J. Putney, Philadelphia.—p. 55.
- Tonsillectomy: Dissection Technic. S. Israel, Houston, Texas.—p. 59.

Chemotherapy in Meningitis.—Appelbaum believes that future progress in the treatment of meningitis secondary to infections of the ears and sinuses will depend mainly on the development of a more effective chemotherapeutic agent, capable perhaps of attacking the primary foci of infection. He has begun to use sulfapyridine in pneumococcal meningitis and hopes to report on it at some future date. The use of sulfanilamide in cases of meningitis due to the hemolytic streptococcus has yielded marvelous results. The prompt and complete eradication

of the primary foci of infection is of particular importance in the forms of meningitis under consideration. Sulfanilamide therapy marks an important advance. By means of this drug and its derivatives one can now treat successfully many of the otherwise almost uniformly fatal infections.

Southern Surgeon, Atlanta, Ga.

8: 1-112 (Feb.) 1939

- Diaphragmatic Hernia: Report of Cases Illustrating Its Varieties. P. E. Truesdale, Fall River, Mass.—p. 1.
- Interposition Operation for Prolapsus Uteri. Q. U. Newell, St. Louis.—p. 28.
- Operative Treatment of Vesicovaginal and Related Fistulas. W. W. Balcock, Philadelphia.—p. 34.
- Carcinoma of the Male Breast. I. M. Wise, Mobile, Ala.—p. 44.
- Bronchial Tumors, Diagnoses and Treatment. E. W. Davis, Washington, D. C.—p. 47.
- Surgical Management of Incompetent Genital Supports in the Female. B. T. Beasley, Atlanta, Ga.—p. 68.

West Virginia Medical Journal, Charleston

35: 57-104 (Feb.) 1939

- Recent Developments in the Surgical Treatment of Lesions of the Biliary Tract. W. Walters, Rochester, Minn.—p. 57.
- Social Medicine and Health Insurance in Europe. W. England, Parkersburg.—p. 65.
- Ruptured Uterus. W. E. Hoffman, Charleston.—p. 74.
- Preliminary Care of the Traumatic Wound. B. I. Golden, Elkins.—p. 77.
- Study of the Treatment of Fractures of the Spine Operative and Non-operative. H. A. Swart, Charleston.—p. 80.
- *Effects of Basketball on Junior High School Boys. A. B. Bowyer and N. S. Anderson, Buckhannon.—p. 89.

Effects of Basketball on Junior High School Boys.—Bowyer and Anderson show that with the new ten second rule the game of basketball is extremely strenuous on junior high school boys from 12 to 16 years of age. To determine whether there is any harmful effect on the hearts of boys of this age playing basketball they have checked the blood pressure and heart rates of boys before and after each basketball game. They also made a preseason and postseason test. The mean or average of the preseason systolic pressure was 108 plus or minus 2.78 and the mean of the postseason pressure was 111.6 plus or minus 2.95. The true difference between the means was 3.6, which was a gain in systolic pressure. The critical ratio was 0.89, which indicates that the mean of the preseason and postseason test is not statistically significant. The authors, therefore, drew the conclusion from their studies that basketball under the old rules did not have any harmful effects on junior high school boys. With their conclusions of 1936-1937 showing no harmful effects, they continued the study under the new rules. One of the most interesting comparisons is made between a hard game and an easy one. In the easy game sixteen boys played at some time or other. There was not a boy on the squad who played the whole game. The heart rates taken twenty minutes after the easy game show that in all the boys but one it had returned to normal, and in this one it was only a fraction higher. The results of a hard game show that the blood pressure of some of the boys goes down, while the pressure of others is increased by exercise. When the blood pressure goes below normal, it indicates a period of staleness or acute fatigue. The boys who did not play the full game would return to normal very quickly after the game. From this the authors decided that a full game of basketball under the new rule was too strenuous on junior high school boys. Their conclusion is substantiated by S. J. Morris of the Health Unit of West Virginia University. The mean pulse rate of the four hardest games of the authors' squad was found to be 146 five minutes after the game. After twenty minutes the heart rate was still 115. The preseason and postseason tests were taken under ideal conditions without the emotional strain of a game. The postseason test shows that the boys' heart rates are higher while their blood pressures are lower. The high heart rates and low blood pressure indicate periods of fatigue that naturally place a strain on the circulatory system. The authors are unable to say with any final degree of authority, but the probabilities are that if this type of strenuous exercise is practiced year after year during the adolescent period it will produce a weakened circulatory system, which may develop into a handicap in later life. They conclude that basketball as played under the present rules is too strenuous for junior high school boys unless several boys, given each at least one quarter of the four to rest in, participate in one game.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

12: 1-64 (Jan.) 1939

- Calcification of the Costal Cartilages. J. B. King.—p. 2.
*Chronic Fluorine Poisoning Seen from the Roentgenologic Standpoint. P. F. Møller.—p. 13.
*Radiologic Manifestations in Bilharziasis. M. Ragheb.—p. 21.
Review of the International Radiologic Literature for January to June 1938. Compiled by A. Orley.—p. 28.
Influence of Wavelength on Biologic Effectiveness of Radiation. H. G. Crabtree and L. H. Gray.—p. 39.
"Tolerance Concentration" of Radon in Atmosphere. J. Read and J. C. Mottram.—p. 54.

Chronic Fluorine Poisoning.—Møller points out that the principal x-ray sign of fluorine poisoning is the changes in the bones. In the cases of severe poisoning the bones, especially the spongy bones, are enormously changed, both in structure and in outline. What first impresses one in looking at roentgenograms of the vertebral column and the pelvis is the almost complete disappearance of normal bony structure, which has been replaced by an almost absolute milky white opacity. The isolated trabeculae appear thick, dense and of a woolly indistinctness. The outlines of the vertebrae too are absolutely lacking in sharpness. The transverse processes are wide, thick and covered with small excrescences, and the spinous processes shine through as a dense, irregular band. This is because, in severe poisoning, the ligaments and fibrocartilaginous attachments also are the seat of extensive calcification. The ligaments on the anterior and lateral aspects of the vertebral bodies form, when calcified, actual bridges between those bodies, and in some cases the picture resulting from the calcifications resembles that of ankylopoietic spondylitis. The posterior ends of the ribs are covered along the edges with large, irregular excrescences resembling hoarfrost needles. In the extremities the compact layers of bone are greatly thickened and the marrow cavities narrowed. The normal cristae are prominent, and at the points of attachment of the large muscles there are large irregular calcifications of the fibrocartilages. The small bones of the hands and feet present the same appearance, but the density is not so great. In the most severe poisoning changes in the cranium also occur. The roentgenologist should be acquainted with the curious osseous changes resulting from such poisoning.

X-Ray Manifestations of Bilharziasis.—The extent of bilharzial infestation can be determined roentgenologically. Ragheb states that bilharziasis exhibits itself on the roentgenogram in two forms: 1. The deposition of ova in the submucosa is followed by ulceration and subsequent calcareous depositions. 2. The deposition of ova is followed by the formation of papillomas; the papillomas, in their turn, may ulcerate or become calcified and then will give the appearance of a calculus. The first form is predominant in the bladder, ureters and seminal vesicles. The second form is usual in the intestine, kidney and pelvis of the kidney.

Journal of Pathology and Bacteriology, Edinburgh

48: 1-244 (Jan.) 1939. Partial Index

- Inorganic Nuclear Content as an Index of Tumor Radiosensitivity. I. A. B. Cathie.—p. 1.
Effect of Liver Damage on the Action of Some Barbiturates. G. R. Cameron and G. S. W. de Saram.—p. 49.
Serologic Typing of Streptococcus Pyogenes and Its Application to Certain Infective Conditions. H. Neisser.—p. 55.
Toxin of Brucella Bronchiseptica and the Relationship of This Organism to Haemophilus Pertussis. D. G. Evans and H. B. Maitland.—p. 67.
Production of Vaginal Mucification with the Synthetic Estrogen Triphenyl Ethylene. A. M. MacDonald and J. M. Robson.—p. 95.
Morbid Anatomy of Gravis, Intermedius and Mitis Diphtheria: Observations on Series of Fifty-One Postmortem Examinations. J. W. McLeod, J. W. Orr and Hester E. de C. Woodcock.—p. 99.
Use of Blood Agar for Identification of Types of Corynebacterium Diphtheriae. H. Wilson and N. E. Goldsworthy.—p. 125.
Diphtheria in Liverpool, with Special Reference to Type Incidence and Severity. H. R. Shone, J. R. Tucker, V. Glass and H. D. Wright.—p. 139.
Incidence and Significance of Types of Diphtheria Bacilli in the Ukraine. K. Zinnemann and I. Zinnemann.—p. 155.
Haemophilus Influenzae of the Respiratory Type as Cause of Purulent Meningitis. J. Mulder.—p. 175.

Journal de Médecine de Lyon, Lyons

20: 69-104 (Feb. 5) 1939

- *Painful Vertebral Osteoporoses. P. P. Ravault, J. Graber-Duvernay and G. Léger.—p. 69.
Preclinical Period. P. Delore.—p. 87.

Painful Vertebral Osteoporoses.—Attention has been called to a curious syndrome characterized anatomically by a striking elective decalcification of the vertebral bodies, likely to produce gross morphologic modifications of the vertebral column; clinically, pain occupies a predominant place. This painful vertebral syndrome of osteoporotic origin must be differentiated from other painful disorders of the vertebral column. It responds to a therapy which in certain cases produces extremely favorable results. Ravault and his associates agree with Decourt that these cases of painful vertebral osteoporoses must be considered as localized forms of osteomalacia. Then they describe the clinical histories of eight personally observed cases and in the subsequent discussion they take up the subjective, objective, roentgenologic and humoral signs of the disorder. After discussing the etiology and pathogenesis they give their attention to the diagnosis and particularly the *differentiation from such disorders as Pott's disease, vertebral cancer, Kümmell-Verneuil's disease, vertebral rheumatism and senile kyphosis*. The therapy of painful vertebral osteoporoses has two chief aims: recalcification and counteracting of the pains. The first object is accomplished by injectable calcium preparations, by vitamins D and A and by the application of ultraviolet rays or heliotherapy. If success is obtained, the pains gradually subside. However, this successful outcome of the treatment is far from being constant; there are some cases which are not improved. A suitable diet may be of assistance in the treatment. The authors recommend especially milk, egg yolks, potatoes, cabbage, peas and fruits. The diet should be rich in vitamins and should stimulate the appetite. In counteracting the pains, the remedies for nervous disorders such as acetylsalicylic acid and antipyrine are not efficient, since their effect is always transitory. The same can be said about the treatment with diathermy and with short waves. Roentgen therapy was found to produce exacerbation of the pains in one instance. On the other hand, the authors found the intradermal injection of histamine effective in a patient who was not improved by the recalcification treatment. One patient was improved only by a series of shocks induced with a sulfur preparation. Finally, orthopedic measures may prove helpful.

Revue d'Orthopédie, Paris

26: 1-96 (Jan.) 1939

- Vertebral Angioma. I. Iacobovici.—p. 5.
Para-Articular Calcifications of Shoulder: Tendinous Ruptures and Pericapsular Bursitis. P. Mallet-Guy and P. Frieh.—p. 20.
*Metastatic Osseous Suppurations with Staphylococcus in Course of Evolution of Furuncles and of Anthrax in Adults. R. Peycelon.—p. 33.
Rare Case of Congenital Osseous Syphilis. J. Marian.—p. 45.
Isolated Fractures of Tarsal Scaphoid: Observations on a Case. P. Decoux and R. Demarez.—p. 51.
Operative Treatment of Scapulohumeral Periarthritis. M. Delitch.—p. 57.
Reduction Under Fluoroscopic Screen of Luxation of Elbow with Interposition of Detached Epitrochlea. H. Tillier.—p. 63.

Metastatic Osseous Suppurations in Adults.—Peycelon points out that acute infectious processes of the skeleton which are truly primary are relatively rare in adults. Many of those which appear in adults are recurrences of osteomyelitic processes of adolescence which had either been forgotten by the patient or had not been recognized at that age. The majority of acute osteomyelitic processes of adults appear as metastatic suppurations. The port of entry can nearly always be found by reference to recent clinical manifestations such as an acute pulmonary process, angina and cutaneous lesions. The localization of the metastatic osseous suppuration of adults presents some unusual aspects; one is that its site of predilection is the long bones, particularly the femur. Nevertheless the flat bones are not exempt, for the author observed it in the iliac crest and in the acetabulum. The most curious aspect, however, is the mediocliphysal localization of the infectious osseous focus in adults, because this diaphysal site contrasts with the juxta-epiphysal topography of such lesions in adolescents. As regards the anatomoclinical aspects, the author differentiates three forms: (1) the panosteitis, which involves

all parts of the bone from the periosteum to the medullary cavity, (2) the cortical osteitis, which is more superficial, and (3) the most superficial form, which is more a periostitis than a true osteitis. In this report the author gives his attention chiefly to this last metastatic staphylococcal periostitis. He describes the histories of six cases, the dominating characteristic of which is the superficial nature of the lesions; only the surface of the bone is touched by the staphylococcal infection. The roentgenograms show a localized periosteal thickening at a point of the diaphysis and this periosteal reaction remains isolated and is not accompanied by even a limited cortical destruction. The patients had been treated for cutaneous suppurations, when they complained of painfulness and slowly a tumefaction appeared. The therapy was indicated by the roentgenologic and clinical aspects. Following the simple incision of the periosteal abscess, the development was uneventful in the six reported cases. Cure was rapidly established, without passage into chronicity or fistula. Thus, the prognosis seems favorable.

Deutsche Zeitschrift für Chirurgie, Berlin

251: 449-552 (Jan. 28) 1939. Partial Index

- *Isolated Avulsion of Trochanter Minor in Epiphysis Line a Typical Sport Injury in Young Persons. K. Herzog.—p. 449.
- Significance of Small Bone Shadows on Vertebral Edges. H. Rosenthal.—p. 463.
- Acute Purulent Coxitis in Venereal Lymphogranuloma. E. Fulde and J. Herzberg.—p. 479.
- Surgical Treatment of Certain Forms of Tuberculosis of Knee Joint. E. Ducrey.—p. 491.
- Clinical Aspects and Therapy of Pancreatic Adenoma. H. Krauss.—p. 512.
- Spontaneous Rupture of Inferior Vena Cava on Basis of Chronic Thrombophlebitis with Massive Hemorrhage into Retroperitoneal Space. F. Osswald.—p. 520.
- Therapeutic Results in Fracture of Forearm. W. Bufo.—p. 539.

Avulsion of Trochanter Minor.—According to Herzog, avulsion of the trochanter minor is now more frequent than was formerly the case. He is convinced that the better recognition since the beginning of the roentgenologic era has not been entirely responsible for the greater incidence but that the increase in athletic activities is largely accountable, because nearly all recently observed cases were sustained in the course of athletic games. The occasions and movements that lead to avulsion of the trochanter minor are usually so similar that this lesion can be regarded as a typical injury from sport. The author describes the clinical histories of two youths aged 17 and 13 who sustained trochanteric avulsion, the one in the course of a hockey game and the other during a football game. That young persons are especially prone to sustain an "isolated" avulsion of the trochanter minor is due to the fact that during these years the epiphysal line of the trochanter minor is the site of least resistance to traction in that the mechanical system, which consists on the one hand of the iliopsoas muscle and the portions of the femur, reaching from the sites of attachment of this muscle to the hip joint and, on the other hand, of the bony pelvis and the vertebral column. This locus minoris resistentiae changes during the different ages. After ossification of the epiphysal line, during maturity, the muscle is the part that is most readily injured, and muscular strains and tears occur. Beyond the age of 50 the bone has the least resistance, and fractures of the trochanter minor may develop. Avulsion of the trochanter minor occurs almost exclusively in young persons who are less than 18 years old. This is understandable if it is considered that at about the age of 18 osseous fusion takes place between the trochanter minor and the femur. Discussing the mechanism of the trauma that elicits the trochanteric avulsion, the author shows that the force which results in the tearing away is elicited by aborted reflex movements; that is, an evolving movement is suddenly changed into a different one. Following a discussion of the clinical signs, he shows that the roentgenologic aspects are decisive for the diagnosis. The prognosis is favorable. Conservative treatment always results in osseous fusion. The patient is placed so that the knee and the hip are slightly bent and the thigh is rotated slightly outward. This position is retained by means of sand bags. Pains and swelling usually disappear rapidly following this immobilization. The roentgenogram reveals formation of callus after from three and one half to four weeks.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

82: 6217-6264 (Dec. 31) 1938. Partial Index

- *Favus and School. H. W. Siemens and A. J. M. Krens.—p. 6224.
- Therapy of Intermittent Claudication. P. Formijne.—p. 6231.

Favus in School Children.—Siemens and Krens deplore the lack of attention paid to the social importance of the contagious skin diseases, particularly favus. They emphasize the importance of enlightening the public and of impressing on the school boards the necessity of detecting and treating all children who have favus. They stress the following points: 1. All schools should be inspected by physicians. 2. Children with favus should be permitted to attend school only if they wear a bandage completely covering the lesions and if they can bring proof that they are undergoing regular treatment by a physician. In order to reach the cases of favus in persons who no longer attend school, ordinances should be passed which prohibit persons with favus from working in places in which they can infect others.

Acta Pædiatrica, Stockholm

23: 141-257 (Dec. 31) 1938. Partial Index

- *Cerebral Defects in Children Delivered by Cesarean Section. T. Brander.—p. 145.
- Is Rickets Due Simply to Vitamin Deficiency? E. Földes.—p. 178.
- Mycosarcomatosis with Clinical Aspects of Chloroma. Cornelia de Lange.—p. 183.
- Congenital Cardiac Disease: Four Cases. E. Mannheimer and P. J. Nordenfelt.—p. 200.
- Aspects of Hematocolpos. C. Hirschberger.—p. 229.
- Congenital Anomaly in Baulhini's Valve and in Appendix as Cause of Peritonitis in the Newborn. P. I. Tuovinen.—p. 234.
- Tabs Dorsalis in Children. S. Wendt.—p. 245.

Cerebral Defects in Children Delivered by Cesarean Section.—Brander says that it is generally believed that the abdominal cesarean section insures against intracranial birth injuries. However, in reviewing the literature he found seventy-two cases of intracranial lesions verified post mortem in children who had been delivered by abdominal cesarean section (cases of vaginal cesarean section excluded). In some of these cases a tearing of the tentorium was discovered. There are also numerous observations on symptoms of intracranial birth injuries, such as defective intelligence, epileptiform convulsions and spastic pareses. The author describes the clinical histories of three children with mental defects who had been delivered by cesarean operation. He admits that in the cases of severe cerebral defects the hereditary conditions are not always sufficiently clear. Moreover, the reports in which the diagnosis of intracranial lesions in children delivered by cesarean operation cannot be doubted contain nothing about the obstetric complications that led to the cesarean operation. In this connection the author points out that the fetus may have been injured by attempted forceps extraction before the cesarean operation was resorted to. The same applies to cases in which prolonged labor pains, perhaps in connection with Walcher's position, preceded the operation. If at this time the head of the child was tightly wedged into the pelvic inlet it may be injured not only before but also during the cesarean operation. Intracranial birth injuries in connection with the cesarean operation occur more frequently in vaginal than in abdominal cesarean section, and of the abdominal methods the corporal involves less dangers for the fetus than does the cervical method. Moreover, the extraction by the foot seems to be more dangerous than freeing the head first, and instrumental development of the head is of course more harmful than is its manual extraction. In cases in which the fetus is large, too short incisions may increase the danger of an intracranial lesion. Complications may arise if the surgical incision injures the placenta. The danger of intracranial hemorrhages in the course of cesarean operations is greater in premature deliveries, in the hemorrhagic diathesis and in pregnancy toxemias. Asphyxia supposedly may cause intracranial hemorrhages; on the other hand, it is probable that intracranial injury may become manifest in asphyxia. That methods of resuscitation may cause intracranial hemorrhages in children delivered by cesarean operation has likewise been observed. Moreover, in two reported cases of fatal intracranial hemorrhages after cesarean delivery, uterine tumors were discovered.

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COMPLICATIONS DUE TO ARSENICAL THERAPY IN SYPHILITIC PREGNANT WOMEN

REPORT OF SEVEN MATERNAL DEATHS

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PHILADELPHIA

Recent writings convey the impression that pregnant syphilitic women tolerate arsenical therapy well.¹ In fact, the fear of serious reaction to the intravenous treatment of these patients with the arsphenamines has become so remote that some authorities recommend this prophylactic procedure for the unborn child, even "on suspicion" that the prospective mother may be diseased.² McCord,³ who has apparently never seen a serious treatment reaction or death in the medical supervision of more than 2,000 syphilitic pregnant women, remarks that "such therapy seems to be safe for the mother." The Cooperative Clinical Group, with Cole⁴ as spokesman, feels that, regardless of antecedent therapy, in order to insure the birth of a healthy child it is desirable to treat intensively throughout each pregnancy every woman who has ever had syphilis, whether the serologic tests of the blood for syphilis are positive or negative or the infection is early or late. Hoffmann,⁵ voicing the opinion of one of the most progressive schools of European medical thought, in his recent lecture in this country goes one step further, recommending that "one or two combined courses should be given as a protection to the offspring" of an apparently well mother, notwithstanding "the absence of diagnostic signs and the presence of a negative serum reaction," provided her husband is known to be syphilitic.

In prescribing antisyphilitic therapy for a pregnant syphilitic woman, consideration of the well-being of the prospective mother should take precedence over the health of the unborn child, as in all other obstetric procedures. The infected woman, under medical observation and treatment during nine months at the most, and on an average during only three or four months of her pregnancy, cannot hope to have her disease cured or in most cases even materially benefited. In

all except an occasional case therefore the physician is concerned with a purely prophylactic procedure, employed to prevent the offspring from becoming diseased. Without in any way denying that the treatment of the pregnant syphilitic woman to prevent her infant from becoming infected in utero is one of the most effective forms of preventive medicine known today, it should be used with caution if the hazard to the mother is appreciable.

Many of the current opinions concerning the fact that "the pregnant syphilitic woman is a good risk for arsenical therapy" are gleaned from the statistics obtained by an analysis of the records of some 4,600 injections of arsphenamine administered to 603 expectant mothers at the five university clinics (Johns Hopkins, University of Pennsylvania, University of Michigan, the Mayo Clinic and Western Reserve University) cooperating with the United States Public Health Service.⁶ They found no significant difference in minor arsenical reactions in the pregnant and non-pregnant groups, but the pregnant women experienced fewer severe arsenical reactions than the nonpregnant (3.08 per thousand injections for the latter, as compared with 0.87 for the former).

This point of view, however, is not without its opponents. To mention only a few of the more recent, Stokes⁷ says: "There is no doubt in my mind that the pregnant woman is not eligible, in general, for strenuous treatment regimens. The pregnant woman should not be overloaded and any signs of reactivity must be taken more seriously than in the normal case." Certain circumstances "may make it preferable to take chances for the child with heavy metal or even no treatment rather than risk the mother's life with a standardized system" (see also Wile and Shaw⁸). As a result of their studies, Plass and Woods⁹ were forced to conclude "that pregnant syphilitic women are more susceptible to the deleterious, as well as to the beneficial, effects of antisyphilitic therapy by modern arsenicals than other individuals." Kuhnel¹⁰ has gone even further in suggesting that "it may be necessary for us to modify our therapeutic view of the prophylactic and syphilitic treatment in pregnancy" (see also Woods¹¹).

While the fact has always impressed me that special care is necessary in handling the syphilitic pregnant

1. McCord, J. R.: Syphilis and Pregnancy, *Am. J. Syph. Gonorr. & Ven. Dis.* 12:181 (April) 1928. Wile and Shaw⁸. Hoffmann⁵.

2. Moore, J. E.: The Modern Treatment of Syphilis, Baltimore, Charles C. Thomas, Publisher, 1933, p. 251.

3. McCord, J. R.: Syphilis and Pregnancy. A Clinical Study of 2,150 Cases, *J. A. M. A.* 105:89 (July 13) 1935.

4. Cole, H. N., and others: Cooperative Clinical Studies in the Treatment of Syphilis: Syphilis in Pregnancy, *Ven. Dis. Inform.* 17:39 (Feb.) 1936. Cole, H. N.: Congenital and Prenatal Syphilis, *J. A. M. A.* 109:580 (Aug. 21) 1937.

5. Hoffmann, Erich: Congenital Syphilis, *Am. J. Syph. Gonorr. & Ven. Dis.* 22:198 (March) 1938.

6. Cole, H. N., and others: Syphilis in Pregnancy, *Ven. Dis. Inform.* 15:83 (March) 1934.

7. Stokes, J. H.: Modern Clinical Syphilology, Philadelphia, W. B. Saunders Company, 1934, p. 1280.

8. Wile, U. J., and Shaw, J. W.: The Prenatal Treatment of Syphilis with Especial Reference to Early Syphilis in the Mother, *J. A. M. A.* 95:1791 (Dec. 13) 1930.

9. Plass, E. D., and Woods, E. B.: Hemorrhagic Encephalitis (Neosarsphenamine) in Obstetric Patients, *Am. J. Obst. & Gynec.* 20:509 (April) 1935.

10. Kuhnel, Poul: Death from Salvarsan Treatment in Pregnancy, *Acta obst. et gynec. Scandinav.* 13:29, 1933.

11. Woods, E. B.: Complications of the Treatment of Syphilis in Pregnancy. Report of Three Cases of Arsenical Encephalitis Complicating Such Treatment, *J. M. A. Georgia* 25:23 (Jan.) 1936.

woman, the realization of the importance of this question has recently been reemphasized by Dr. Philip F. Williams, who called my attention to the seven maternal deaths directly attributable to arsenical therapy which have been reported in one locality since 1931 to the Committee on Maternal Welfare of the Philadelphia County Medical Society. In addition, a careful review of the statistics obtained from the administration of 6,345 injections of neoarsphenamine to 733 pregnant syphilitic women during the last five years at the Philadelphia General Hospital revealed a much higher incidence of treatment reactions than is generally attributed to this type of therapy among such patients.

Several additional circumstances made it seem worth while to discuss this problem. In the first place there are in the literature relatively few series of cases large enough to warrant the drawing of accurate conclusions concerning the incidence of treatment reactions among pregnant syphilitic women. Then at least one group of observers tended to collect data only from patients who had been under observation for at least six months.¹² Many pregnant syphilitic women remain under observation for a shorter period than this, particularly if they are intolerant of arsenical therapy. Furthermore, the incidence of reactions probably varies greatly, depending on the economic status of the patients, their state

arsenical therapy. Klasten¹⁶ and Reif¹⁷ both described patients with symptoms of hemorrhagic encephalitis who recovered. Spillmann, Weille and Weissmann¹⁸ referred to a young pregnant woman with early syphilis in whom hemiplegia developed during arsenical therapy. Audebert and Fabre¹⁹ reopened the question of erythrodermia and dermatitis complicating antisyphilitic therapy of pregnant women. Finally it is entirely possible that delayed arsenical reactions resulting from treatment during pregnancy, for example damage to the liver or bone marrow, the symptoms of which often take several weeks to appear, have not uniformly been recorded as reactions resulting from treatment during pregnancy when the initial symptoms have appeared after delivery. If this is true, it would lead to a false impression as to the incidence of more severe types of reaction among treated syphilitic pregnant women.

TREATMENT REACTION: IN THE ANTEPARTUM
SYPHILIS CLINIC OF PHILADELPHIA
GENERAL HOSPITAL

TABLE 1.—Treatment Reactions Complicating Arsenical Therapy of 733 Pregnant Syphilitic Women at Philadelphia General Hospital, as Compared with the Statistics of the Cooperative Clinical Group^a on Syphilitic Mothers "Not During Pregnancy"

Reactions	Philadelphia General Hospital		Cooperative Clinical Group ^a
	Number of Reactions (6,345 Injections)	Rate per Thousand Injections	Rate per Thousand Injections (6,431 Injections)
Gastrointestinal disorders.....	144	22.75	6.22
Nitritoid crisis.....	24	3.79	3.73
"	5	1.26	1.71
"	27	4.27	4.04
Kidneys.....	14	2.61	0.16
Purpuric phenomena (with			
Se ^c	7	1.11	0.00
"	1	0.16	0.00
"	2	0.32	1.40
Icterus.....	8	1.26	0.62
Death (colloidoclastic shock)...	1	0.16	0.00

of nutrition and their environment. Thus a patient at Philadelphia General Hospital would be expected to react differently from one at a university clinic or a private patient, and conclusions drawn for one group could not always be transferred directly to the next. Moreover, I am forced to the conclusion, from various references in the literature, that severe treatment reactions among pregnant women are much more frequent than is generally supposed.¹⁰ Thus, McKelvey and Turner¹³ and Moore¹⁴ both mentioned the four deaths from acute yellow atrophy of the liver which followed arsenical therapy of syphilitic pregnant women at the Johns Hopkins Hospital. Clason¹⁵ referred to eclampsia in one of his cases as being precipitated by

Table 1 summarizes five years' experience with treatment reactions in the antepartum syphilis clinic at the Philadelphia General Hospital. The group studied was roughly one third white and two thirds Negro. Unfortunately it was not possible for me to obtain data as to the total incidence of treatment reactions in the type of nonpregnant patients attending the general syphilis clinic of his institution, and it may be that this figure also is higher than normal. In order to make my own statistics somewhat more understandable, however, I have incorporated in the table the reaction rate per thousand injections from the figures of the Cooperative Clinical Group for syphilitic women treated between their pregnancies; it happens that an almost identical number of injections were given to each of these groups. This comparison brings out strikingly the facts which have been noted previously by various investigators,²⁰ namely the pregnant woman's increased susceptibility to gastrointestinal reactions, to irritation of the kidneys and to hepatic insufficiency. In pregnant women nausea, vomiting and diarrhea as a result of arsenical therapy are roughly three and one half times more frequent, jaundice is twice as frequent and evidence of kidney strain is about sixteen times more frequent than in nonpregnant women. It is interesting to note that among the women treated at the Philadelphia General Hospital the incidence of gastrointestinal disturbances was twice as great, of pruritus and cutaneous eruptions three times and twice as great, respectively, and of icterus six times as great as in the series of pregnant women whose cases were reported by Cole and his co-authors.⁶

In this series there was no evidence that pregnant syphilitic women tolerate arsenical therapy well. Only in the case of generalized exfoliative dermatitis was the incidence appreciably lower than in the nonpregnant group. Here again the duration of therapy was probably an important factor, since such a reaction usually occurs after a longer course of arsphenamine than these

12. Cole, H. N., and others: Cooperative Clinical Studies in the Treatment of Syphilis: Arsenical Reactions, Ven. Dis. Inform. 14: 175 (Aug.) 1933; Syphilis in Pregnancy.⁶

13. McKelvey, J. L., and Turner, T. B.: Syphilis and Pregnancy: An Analysis of the Outcome of Pregnancy in Relation to Treatment in 943 Cases, J. A. M. A. 102: 503 (Feb. 17) 1934.

14. Moore: The Modern Treatment of Syphilis, p. 98.

15. Clason, S.: Eklampsie oder Salvarsanvergiftung? Drei Todesfälle mit diskutabler Genese, Acta obst. et gynec. Scandinav. 12: 40, 1932.

16. Klasten, E.: Die Prinzipien der antisyphilitischen Behandlung der Schwangeren, Arch. f. Gynak. 135: 620 (Feb.) 1929.

17. Reif, F.: Ueber gehäuftes Auftreten von Enzephalitis nach Neo-salvarsan, München. med. Wchnschr. 68: 14 (Jan. 7) 1921.

18. Spillmann, L.; Weille, R., and Weissmann: Hémiplegie post-arséno-benzolue, Bull. Soc. franç. de dermat. et syph. 43: 1380 (July) 1936.

19. Audebert, J. L., and Fabre, Jacques: Accouchement prématuré et érythrodermie due au néo salvarsan, Bull. Soc. d'obst. et de gynec. 17: 779 (Oct.) 1928.

20. Lewin, E. M.: Neues zur Lehre über die Toxische Wirkung der Arsenobenzolpräparate auf die Leber, Arch. f. Dermat. u. Syph. 166: 711 (Oct.) 1932.

patients received (average 8.4 injections). In the two cases in this series in which this manifestation did occur, it developed at about the time of delivery and extended some weeks into the puerperium.

The number of pregnant syphilitic women who become nauseated and vomit after neoarsphenamine treatment is noteworthy. This reaction is rarely an indication for suspension of arsenical therapy or even for reducing the dose. In my 733 cases the severity of this reaction made it necessary to stop intravenous injections in twelve cases. Nine additional patients were carried along with little discomfort by reducing the size of the dose and administering $\frac{1}{100}$ grain (0.6 mg.) of atropine sulfate. Irritability of the kidneys likewise is not an indication for cessation of treatment unless the patient shows evidence of toxemia of pregnancy, such as increasing hypertension, headache, disturbance of vision, marked albuminuria or edema of the ankles. In the presence of definite or incipient toxemia it has been my experience that no type of antisyphilitic therapy is well tolerated, and, since the risk in administration of these drugs is great to a patient whose elimination is poor, it is best to discontinue antisyphilitic treatment entirely. The jaundice which I have seen has occurred close to term and, on the cessation of arsenical therapy, has cleared up post partum without evidence of permanent hepatic damage. The death recorded in table 1 is that in case 4, described subsequently.

MATERNAL MORTALITY FROM ARSENICAL THERAPY DURING PREGNANCY

In an effort to demonstrate that the pregnant syphilitic woman is by no means immune to the serious treatment reactions attending antisyphilitic therapy and to suggest, moreover, that she may be, as some authors feel, more susceptible than the nonpregnant woman, thirty-five reported cases have been collected and summarized, and the seven cases discussed before the Maternal Welfare Committee of the Philadelphia County Medical Society have been briefly analyzed. The cases gathered from the literature include the twenty-three described in detail by Kühnel,¹⁰ the case of eclampsia reported by Clason,¹⁵ the cases of exfoliative dermatitis of Lorenzen²¹ and Kirstein²² and the cases reported by Scheel,²³ Neustadt,²⁴ Cole and his associates,²⁵ Plass and Woods,⁹ Cormia,²⁶ Gierlich and Künkele²⁷ and Lanzenberg and Laugier.²⁸

These forty-two cases represent most of the known types of serious arsenical complications (table 2). In almost two thirds the condition falls into the category of acute encephalopathy, which has come to be termed in the literature acute hemorrhagic encephalitis because of the intense cerebral congestion revealed by autopsy

(wet brain with multiple punctate hemorrhages²⁹). The fact that pregnant syphilitic women are particularly susceptible to this type of treatment reaction was early recognized by Meirowsky,³⁰ Gammeltoft³¹ and Klaf-ten,¹⁶ and the question has recently been reviewed by Cormia²⁶ and by Plass and Woods.⁹ Kühnel¹⁰ has given a graphic description of the condition, which, coming on in the latter part of the pregnancy, most often after from one to three arsenical injections to a woman with early syphilis, with the symptom sequence of headache, vertigo, malaise, nausea, vomiting, hyperpyrexia, clonic convulsions, unconsciousness, cyanosis and death within twenty-four to seventy-two hours, forms a distinctive clinical entity.^{31a}

TABLE 2.—Cause of Thirty-Five Fatal Arsenical Reactions Collected from the Literature, with Seven Additional Cases from the Philadelphia County Medical Society

	From Literature	My Cases	Total	Percentage
Acute encephalopathy (hemorrhagic encephalitis).....	24	3	27	64.3
Acute circulatory collapse (colloidoclastic shock).....	2	2	4	9.5
Parenchymatous degeneration of the liver (and kidneys).....	2	1	3	7.1
Arsphenamine dermatitis.....	2	..	2	4.8
Aplastic anemia.....	0	1	1	2.4
Eclampsia (precipitated by antisyphilitic therapy).....	1	..	1	2.4
Cause unknown.....	4	..	4	9.5
	35	7	42	100.0

Acute circulatory collapse most often follows the second or third arsenical injection and presents the picture clinically of colloidoclastic shock described by Orr³² and Weinberg³³ and pathologically of dilatation and intense congestion of all peripheral vessels (case 4). In both cases,³⁴ of arsphenamine dermatitis the condition was complicated by pyoderma and puerperal sepsis developing post partum. Eclampsia accompanying arsenical therapy or precipitated by it may be more frequent than the single case recorded by Clason¹⁵ would indicate. In connection with the case of aplastic anemia (recorded subsequently) it should be noted that definite symptoms of the condition did not develop for from four to eight weeks after delivery and that in a statistical compilation it would be easy to overlook such a condition as resulting from arsenical therapy during pregnancy.

REPORT OF CASES

CASE 1.—Death from aplastic anemia.^{34a} History.—An apparently healthy white woman aged 18, reported Oct. 2, 1936, for antepartum supervision during the fourth month of her

29. Cook, S. S.: Postmortem Findings in Fatalities Due to the Use of the Arsphenamine Group: A Review of 44 Autopsies, *Pub. Health Rep.* 51: 927 (July 10) 1936.

30. Meirowsky, E.: Bericht der Salvarsan-Kommission des Allgemeinen Aerztlichen Vereins in Köln, München, med. Wchnschr. 67: 477 (April 23) 1920.

31. Gammeltoft, S. A.: Ueber einen Fall von Encephalitis hämorrhagica nach Salvarsanbehandlung während der Schwangerschaft, *Acta obst. et gynec.* 10: 192 (1931).

31a. From hemorrhagic encephalitis among pregnant syphilitic women in the recent literature of this country tend to stress the increasing importance of this complication. They are reported by:

Sawyer, K. C., and Dwyer, P. K.: Hemorrhagic Encephalitis Following Injection of Neoarsphenamine, *Colorado M. J.* 33: 250 (April) 1936.

Kuehn, Conrad; Keating, R. A., and von Haam, E.: Arsenical Encephalitis During Pregnancy, *Am. J. Obst. & Gynec.* 36: 122 (July) 1938.

Paley, S. S., and Pleshette, Norman: Hemorrhagic Encephalitis in Pregnancy Following Antisyphilitic Therapy with Neoarsphenamine, *Am. J. Syph., Gonorr. & Ven. Dis.* 23: 691 (Jan.) 1939.

32. Orr, Harold: Medical Shock Following Use of Neoarsphenamine, *Brit. J. Dermat.* 45: 58 (Feb.) 1933.

33. Weinberg, Tobias: Medical Shock Following Intravenous Therapy with Neoarsphenamine, *Am. J. Syph., Gonorr. & Ven. Dis.* 21: 376 (July) 1937.

34. Lorenzen.²¹ Kirstein.²²
34a. Mortimer Goldberg (Am. J. Syph., Gonorr. & Ven. Dis. 23: 79 [Jan.] 1939) has recently reported a case of bone marrow injury from neoarsphenamine therapy in a syphilitic pregnant woman with recovery.

21. Lorenzen, H.: Ueber einen Fall von Salvarsanvergiftung in der Schwangerschaft mit tödlichen Ausgang im Wochenbett, *Zentralbl. f. Gynäk.* 45: 1407 (Oct. 1) 1921.

22. Kirstein, F.: Salvarsanexanthem in der Gravidität und Exitus im Wochenbett, *Zentralbl. f. Gynäk.* 46: 1634 (Oct. 14) 1922.

23. Scheel, V.: Tülfælde af akut Leveratrofi; Syfilis Graviditet; Salvarsanintoxikation, *Ugesk. f. Læger.* 81: 1817 (Nov. 20) 1919.

24. Neustadt, A.: Ein Todesfall nach einzeitig kombinierter intravenöser Salvarsan- und Jodbehandlung der Syphilis nach Bruck, *Deutsche Wchnschr.* 64: 1921.

25. Cole, J. A. M. A. 97: 897 (Sept. 26) 1931.

26. Cormia, F. E.: Hemorrhagic Encephalitis from Neoarsphenamine in Pregnancy, *Canad. M. A. J.* 35: 610 (Dec.) 1936.

27. Gierlich, J., and Künkele, F.: Pathologisch-anatomische und chemische Untersuchungen bei einem Fall von Salvarsantod in der Schwangerschaft, *Deutsche Ztschr. f. d. ges. gerichtl. Med.* 27: 116 (Sept.) 1936.

28. Lanzenberg, P., and Laugier, P.: Mort rapide survenue chez une femme enceinte au cours d'un traitement arsénobismuthique avec vomissements, vertiges, légères contractures musculaires, état comateux, foyers hémorragiques au niveau du bulbe, *Bull. Soc. franç. de dermat. et syph.* 43: 477 (March) 1936.

second pregnancy. The previous pregnancy, which terminated Nov. 5, 1935, had resulted in a living infant with congenital syphilis. The mother's infection was latent; serologic study of the blood at the time of the first visit showed the Kolmer reaction 44 and the Kahn 444. The stage of the disease was unknown, but it was probably early. Her antepartum course was uneventful, except that she showed a trace of albumin in the urine on five different occasions in late pregnancy. The blood pressure varied between 94 and 120 mm. of mercury systolic and 48 and 84 diastolic. She was delivered of a normal infant after seven hours of labor March 9, 1937. Her hemoglobin concentration was 81 per cent immediately post partum.

Antisyphilitic Therapy.—During pregnancy, from Oct. 2 to Nov. 6, 1936, she received six 2 cc. injections of bismuth subsalicylate (each cubic centimeter equals 60 mg. of metallic bismuth). From Nov. 13 to March 6, 1937, she received concurrent treatment with triarsen³⁵ and a bismuth preparation (total, twelve injections of triarsen [5.75 Gm.] and sixteen injections of bismuth salicylate [31 cc.] without reaction. She received no treatment for syphilis post partum.

Course.—She was readmitted to the hospital May 17, 1937, because of vaginal bleeding, which had continued since the birth of the child, gradually becoming worse, with recent abdominal pain and passage of clots, bleeding gums for one month, epistaxis, and purpuric spots on the arms and lower extremities of six weeks' duration. At the time of admission gingival ulcerations were noted. There was abundant albuminuria from May 19 to death. The results of studies of the

TABLE 3.—Results of Studies of the Blood in Case 1

Date	Erythrocytes	Hemoglobin, %	Leukocytes	Neutrophils	Lymphocytes	Monocytes	Transitional Forms	Eosinophils	Basophils	Platelets
5/19/37	780,000	10	7,000	27	70	..	0	1	0	.....
5/20/37	1,640,000	35	6,000	17	80	..	1	0	0	82,000
5/21/37	.....	45	.....	40	60	..	..	..	..	.....
5/23/37	2,060,000	58	4,000	5	95	..	..	..	..	92,600
5/26/37	2,000,000	40	2,600	..	..	..	..	..	..	..
5/27/37	2,360,000	50	1,800	4	96	..	..	..	..	..

blood are shown in table 3. Transfusions were given May 19, 22 and 26, but the patient died with marked hyperpyrexia (temperature 105 F.) May 27.

Autopsy.—Aplastic anemia following arsenical therapy, with generalized purpuric phenomena, was reported. The skin, mucosal surfaces and serosa showed evidence of ecchymoses throughout. There were confluent lobar hemorrhages in the lungs, acute passive congestion in the liver and follicular hyperplasia and passive congestion in the spleen. The kidneys showed extreme cloudy swelling and acute gangrenous pyelitis. Histologic examination of bone marrow gave results typical of aplastic anemia.

CASE 2.—Acute yellow atrophy of the liver. *History.*—A well developed and well nourished Negro woman aged 38 reported Jan. 7, 1936, for antepartum supervision in the twenty-sixth week of her second pregnancy. She had had a negative Wassermann reaction in another institution in January 1935, but strongly positive Kolmer and Kahn reactions were present on her first antepartum visit; the results were confirmed January 14. She gave no history of previous treatment and no history of onset of infection.

Antisyphilitic Therapy.—She received four injections of bismarsen (0.2 Gm. each) intramuscularly between January 21 and February 25 without reaction.

Course.—March 3 she was admitted to the hospital because of increasing jaundice, icteric skin and scleras, deep colored urine and clay colored stools. After admission severe gastric hemorrhage developed; the patient could retain no food taken by mouth and finally became comatose and died March 10.

35. Stokes, J. H., and Beerman, Herman: New Arsphenamine Synthetics in the Treatment of Syphilis: A Consideration of Test Procedure and of a New Drug (Triarsen), Arch. Dermat. & Syph. 35: 78 (Jan) 1937.

Autopsy.—Syphilitic aortitis, marked jaundice and acute yellow atrophy of the liver were evident. In this case it is impossible to state whether the arsenical therapy was the sole cause or merely the precipitating cause of death, but it was felt that it played at least some part in the unfortunate outcome.

CASE 3.—Acute circulatory collapse. *History.*—A Negro woman aged 32 reported in January 1933 for antepartum supervision in the twenty-sixth week of her third pregnancy. Serologic study of the blood gave strongly positive results at the time of her first visit (Kolmer 44, Kahn 444). The duration of her disease was unknown, but she was found to have a positive serologic reaction of the blood for syphilis in another institution in 1927 and had received arsenical therapy for thirteen weeks at that time, with none since. Complete cardiovascular study March 15 showed possible syphilitic aortitis and signs of "potential" myocardial involvement.

Antisyphilitic Therapy.—April 1 she received 0.025 Gm. of bismarsen intramuscularly, April 8 0.3 Gm. of neoarsphenamine and April 15 0.45 Gm. of neoarsphenamine, without reaction. With the third injection (0.45 Gm.) of neoarsphenamine, given April 22, she became dyspneic and cyanotic while in the treatment room, with a fall of blood pressure and rapid almost imperceptible pulse. She became comatose within a few minutes and, although admitted to the hospital immediately and given emergency stimulative treatment, died within an hour.

Autopsy.—Syphilitic aortitis and coronary and myocardial involvement were present, with acute dilatation of the heart. There was generalized acute passive congestion. Death may have been due to coronary insufficiency, the result of the rapid healing fibrosis of therapeutic paradox, but the sudden onset of symptoms during injection also brings up the question of acquired arsenical intolerance. The brain was not examined. Nothing observed antepartum among the terminal symptoms or at autopsy suggested toxemia of pregnancy.

CASE 4.—Acute circulatory collapse. *History.*—An apparently healthy Negro woman aged 22 reported to the antepartum clinic during the fourth month of her fifth pregnancy. Kahn and Kolmer-Wassermann tests performed November 3 and on two subsequent visits gave negative results. She was known to have syphilis, however, having first been discovered to have a positive serologic reaction of the blood in 1931. She had had no arsenical treatment during her first pregnancy, two months of arsenical therapy during her second, nine months of arsenical and heavy metal therapy during her third, and two months of arsenical therapy during her fourth. She had had no treatment for syphilis for one year prior to her present conception and would have been considered clinically "cured." In view of the fact that she had tolerated previous treatment well, and since she appeared in good health and normal on physical examination, it was decided to treat her for the sake of her child. Antepartum supervision between Nov. 3, 1937, and Jan. 12, 1938, revealed normal blood pressure and urine and no evidence of toxemia of pregnancy.

Antisyphilitic Treatment.—Neoarsphenamine 0.3 Gm. was given intravenously Jan. 12, 1938, with no reaction; 0.45 Gm. was given January 19.

Course.—Ten minutes after her second injection she complained of acute abdominal pain and collapsed on the floor. Within five minutes she lost consciousness; the skin became cyanotic, cold and clammy and the pulse rapid and thready. The blood pressure, at first maintained, became rapidly lower. She exhibited muscular twitching and choreiform movements and in spite of stimulative treatment (epinephrine, atropine, caffeine) died within one hour.

Autopsy.—There was no evidence of syphilis in any of the organs. The picture was that of acute circulatory collapse, with generalized capillary dilatation. The lungs, spleen, liver and kidneys showed intense acute passive congestion. The heart, coronary vessels and aorta were normal. The bones of the skull were hemorrhagic, the dural sinuses were dilated and there was intense congestion with subarachnoid hemorrhage. The brain was intensely edematous, with hemorrhages into the ependymal lining of the ventricles. It was felt that the intracranial as well as the general systemic picture was merely attendant on the acute circulatory collapse.

CASE 5.—Acute encephalopathy. *History.*—A Negro woman aged 30, married, in good general health, reported for antepartum supervision in the sixth month of her third pregnancy. On the first visit she was discovered to have weakly positive Kolmer and Kahn reactions. She gave no history of antecedent antisyphilitic therapy, and the duration of her infection was unknown. Her blood pressure and urine were always normal.

Antisyphilitic Treatment.—Neoarsphenamine 0.3 Gm. October 8 and 0.6 Gm. October 15 was given without evidence of intolerance.

Course.—Two days after the last injection she was admitted to the hospital because of dizziness and pain in the lower part of the abdomen. October 18 she had a bilateral convulsion lasting ten minutes and three hours later two generalized convulsions of short duration, following close one on the other. She was unconscious thereafter until death, some five hours later. There were no clinical or laboratory signs of eclampsia; a normal living child was delivered immediately after the death of the mother.

Autopsy.—Nothing significant was observed except evidence of acute encephalitis, with exudation and capillary hemorrhage, and parenchymatous cerebral syphilis. It is impossible to state in this case whether death resulted from therapeutic shock (Herxheimer reaction) in an area already diseased from syphilis or from the hemorrhagic encephalitic syndrome, so frequently described as complicating arsenical therapy among pregnant women. Death apparently did not result, however, from a massive intracranial hemorrhage or from any gross single lesion.

CASE 6.—Acute encephalopathy. *History.*—A healthy young white woman aged 24 reported for antepartum supervision Oct. 21, 1932, during the sixth month of her first pregnancy. Syphilis was diagnosed by means of a strongly positive Wassermann test, confirmed. The duration of the disease was unknown.

Antisyphilitic Therapy.—Neoarsphenamine 0.5 Gm. October 31 and 0.5 Gm. November 14 was given without reaction.

Course.—Shortly after the second injection the patient became nauseated and vomited, the reaction continuing until she was admitted to the hospital November 16. At this time she complained of severe headache and was restless, stuporous and markedly spastic. Before death twenty-four hours later she became unconscious and cyanotic and had focal and generalized convulsions; her temperature rose from 102 F. on admission to 106 at the time of death. Complete laboratory studies gave no evidence of eclampsia. There was no albumin in the urine. The blood showed sugar 120 mg., urea 13 mg., urea nitrogen 9.4 mg., creatinine 2.7 mg., calcium 8 mg. and phosphorus 3.5 mg. per hundred cubic centimeters. The blood pressure varied between 112/60 and 130/60. In the cerebrospinal fluid there were 1 mg. of globulin, no sugar, 1 cell and 2 mg. of albumin per hundred cubic centimeters.

Autopsy was refused. In this case the clinical picture was typical of that described by Kuhnel¹⁰ and others as complicating arsenical therapy of syphilitic pregnant women.

CASE 7.—Acute encephalopathy. *History.*—A white woman aged 31 reported for antepartum supervision in the sixth month of her fourth pregnancy. She gave no history of syphilitic infection or of previous treatment, but four consecutive serologic tests of the blood were reported to show medium positive Kolmer, Wassermann and Kahn reactions between Aug. 26 and Sept. 16, 1933. On the basis of these tests a diagnosis of latent syphilis of unknown duration was made and treatment started. The Wassermann reaction had been negative in 1930.

Antisyphilitic Therapy.—Neoarsphenamine 0.3 Gm. September 23 and 0.45 Gm. September 30 was given.

Course.—The night following the second injection she had a severe headache and high fever but the next day she felt better. October 2 she again felt dizzy and she went to bed and slept. On awaking she found that she could not talk and was too weak to get up, and when she attempted to move she had a convulsive seizure involving the left side of the body. She was admitted to the hospital the same day and showed left hemiplegia. It was the opinion of the syphilologic staff

that such a lesion could have been caused by cerebrovascular therapeutic shock (Herxheimer reaction). She died October 4. Before death her temperature rose from 98 to 104 F. and the blood pressure from 104/80 to 150/100. The urine showed a cloud of albumin during the febrile period; the blood, 124 mg. of sugar and 24.7 mg. of urea nitrogen per hundred cubic centimeters. In the cerebrospinal fluid the colloidal gold curve was 0000000000, the Wassermann reaction negative and the pressure 8 mm. of mercury; there were 37 cells and 3 mg. of globulin per hundred cubic centimeters. It was felt that neither the symptoms nor the laboratory data were indicative of toxemia of pregnancy.

Autopsy was refused. This case likewise would seem to be one of a cerebrovascular lesion resulting from arsenical therapy during pregnancy.

COMMENT

A critical analysis of the medical handling of the foregoing forty-two cases of maternal death following antisyphilitic therapy during pregnancy reveals many interesting facts. The age of the patient and her parity apparently have little influence on the fatal termination. The fact that 31 per cent of the patients were under 21 and 69 per cent under 28 years of age is probably no more than a reflection of the truth that the young women bear the children and that the maximum incidence of syphilis in this country is between the ages of 21 and 28. It does suggest, however, that mere youth and the general appearance of physical well-being by no means exclude the possibility of a serious reac-

TABLE 4.—Type of Infection at the Onset of Antisyphilitic Therapy in Forty-Two Fatal Cases

	Number	Percent- age
Syphilitic		
Symptomatic early (primary or secondary).....	16	38.1
Latent of less than four years' duration.....	4	9.5
Latent of more than four years' duration.....	7	16.7
Latent (duration unknown).....	13	30.9
Symptomatic late.....	1	2.4
Nonsyphilitic.....	1	2.4
	42	100.0

tion to arsenical therapy. Only two of the patients were over 36 years of age. Multiparas and primiparas suffered almost equally, 58 per cent of the former and 42 per cent of the latter comprising this series.

An analysis of the statistics, moreover, with regard to the duration of syphilis at the time of the onset of therapy reveals the surprising fact that in almost one half of the cases the physician was concerned with early syphilis, primary, secondary or latent of less than four years' duration (table 4). In more than half of the remaining cases the disease was a symptomless infection of unknown duration, so that in actuality in only eight instances (19 per cent) was the disease known to be more than four years old. Death resulted in one case in which syphilis had not been proved, therapy being administered merely because the husband was found to be infected. Instances of this sort and like case 4 bring into serious question the advisability of intensive arsenical therapy when the chances of infection of the child are so meager, even though the prospective patient gives outwardly the appearance of a good treatment risk. Although the series of cases was too small to permit of any sweeping conclusions, it is worth while to note in this connection that the fifty-two mothers in the Cooperative Clinical Group⁶ study who became pregnant after having had sufficient treatment to be considered "cured" had no syphilitic children among those born up to fifteen years after infection,

even though not treated during each subsequent pregnancy. Hoffmann's³⁶ considerable experience in this regard should also be considered. He said "A new course of treatment is not necessary in later pregnancy in women who have been treated intensively and systematically and whose cure may be assumed with sufficient probability."

Of this series of fatal cases treatment was started during the first four calendar months in 12 per cent, during the fifth or sixth month in 41 per cent and after the sixth month in 47 per cent. This again is nothing

TABLE 5.—Number of Arsenical Injections After Which First Clinical Symptoms Appeared in Forty-Two Instances of Maternal Death

Number of Injections	Cases	Percentage
One	5	11.9
Two	10	23.8
Three	10	23.8
More than three	5	11.9
	42	100.0

more than a confirmation of the circumstance frequently noted before in the literature, that pregnant syphilitic women report for antisyphilitic therapy late in pregnancy. It is usually necessary as a result of this to commence treatment when the physical burden of the woman in bearing her child is already well advanced. Only eight (19 per cent) of these patients had had antisyphilitic treatment prior to the pregnancy, two (4.7 per cent) had received more than twenty arsenical injections and six (14.3 per cent) had received less than this amount.

This fact brings up at least three important points for consideration: (1) preparatory treatment, (2) the question of individual intolerance or idiosyncrasy and (3) the ability of the already burdened pregnant woman to cope with the additional strain of antisyphilitic therapy.

When it is considered that one third of these women presented symptomatic early syphilis (primary or secondary) during their pregnancy and that only two showed evidence, either clinically or pathologically, of any serious late complication of the disease, it is probable that in most instances preparatory treatment with a heavy metal (a mercury or a bismuth preparation) prior to the institution of arsenical therapy was seldom seriously considered. Thirty-nine per cent of the patients received some preparatory treatment and 61 per cent none. It should, however, be pointed out that attempts to prepare patients for arsenical therapy have been inadequate, consisting for the most part of one or two injections of a heavy metal or their equivalent at from five to seven day intervals. According to present notions no less than from two to three weeks' treatment with a water-soluble heavy metal mercury or bismuth preparation in an adequate dose two or three times weekly or three or four weekly injections of an oil-suspended preparation (e. g. bismuth subsalicylate) could be expected to offset the shock of onset of arsenical therapy.

One of the most striking features of the entire analysis is the revelation that 81 per cent of these fatal treatment reactions were precipitated by three or less arsenical injections (table 5). In the majority of the

remaining cases death resulted from damage to the liver, changes in the bone marrow or complications of exfoliative dermatitis which not infrequently require a number of days for development of clinical symptoms. Death likewise has been a matter usually of only hours or days (table 6). In only two instances in the series could the dose of the drug employed have been considered excessive, and this not markedly so (e. g. 0.5 Gm. of neoarsphenamine at five day intervals). Death following shortly after a single arsenical injection brings up for consideration the possibility of atopic drug allergy, and instances in which the symptoms with fatal termination followed closely the second or third injection suggest sensitization (acquired allergy). Such speculation finds further confirmation in the pathologic observations in many of these cases, consisting only of extreme peripheral congestion of acute circulatory collapse, with the hemorrhagic phenomena in the brain and other organs of capillary anoxemia or intoxication and increased permeability of the vessel walls. Whether the pregnant woman is more susceptible to the major and minor complications of arsenical therapy than the nonpregnant one is a matter on which there is still considerable difference of opinion among physicians. I feel that I have advanced evidence from my personal experience and from the literature which would indicate that at best the pregnant syphilitic woman is only a moderately good risk for arsenical therapy. Certainly principles of treatment which would be considered invalid for nonpregnant women (e. g. the onset of arsenical therapy in full dosage without adequate preparation in a case of late syphilis or of latent syphilis of unknown duration) should not be employed in the management of a syphilitic pregnant woman in the general haste and eagerness for protecting the unborn child.

Finally, both in the cases collected from the literature and in those reported locally there is much to indicate that the severity and the unusualness of the type of

TABLE 6.—Time After Commencement of Arsenical Therapy at which Clinical Symptoms and Death Occurred

Days After Onset of Arsenical Therapy	First Clinical Symptoms		Death	
	Number of Cases	Percentage	Number of Cases	Percentage
—1	1	2.4	1	2.4
2 to 7	14	33.1	9	21.4
8 to 14	10	23.8	12	28.6
15 to 23	9	21.2	13	30.9
24+	7	16.7	7	16.7
	41	100.0	42	100.0

treatment reactions described in this paper, occurring usually in an obstetric service, resulted too often in an unwarranted delay and at times in almost complete omission of recognized emergency therapy. While this is neither the time nor the place for a detailed discussion of the management of severe arsphenamine reactions, it cannot be overemphasized that if colloidal shock, for example, is to be successfully combated, a matter of a few minutes hesitation in the onset of treatment with warmth and slow intravenous administration of dextrose (from 10 to 15 per cent solution) may be crucial. With hemorrhagic encephalitis epinephrine therapy with venesection and spinal drainage is successful ordinarily only when commenced before repeated convulsive seizures develop and before the

36. Hoffmann, Erich. Congenital Syphilis: In the Light of Thirty Years' Investigation of the Spirochete and Twenty-Five Years' Experience with Salvarsan. J. Pediat. 9: 369 (Nov.) 1936.

patient becomes comatosed. These severe treatment reactions are to be considered extremely serious but never hopeless if handled with dispatch.

SUMMARY

Statistics taken over a five year period in a large general hospital where the general principles involved in the teachings of the Cooperative Clinical Group on the management of syphilis in pregnancy are rigidly adhered to would indicate that under certain circumstances or with certain classes of patients during pregnancy there is a markedly greater incidence of treatment reactions than with other reported groups.

That this higher incidence of treatment reactions is not a peculiarity of the institution from which this series emanates is suggested by the seven maternal deaths from antisyphilitic therapy reported from six different sources to the Committee on Maternal Welfare of the Philadelphia County Medical Society since 1931.

An analysis of the statistics pertaining to the thirty-five additional deaths collected from the literature indicates that the pregnant woman is not exempt from any of the severer types of treatment reaction, hemorrhagic encephalitis, acute circulatory collapse, damage to the liver, arsphenamine dermatitis and aplastic anemia all having occurred with fatal termination. There is, moreover, evidence to indicate that antisyphilitic therapy may aggravate an already existing toxemia or precipitate an incipient one.

This presentation is not intended in any way to depreciate the value of antepartum antisyphilitic therapy in protecting the unborn child in utero. All the authoritative literature indicates that at present the treatment of infected pregnant women forms one of the best imaginable fields of preventive medicine.

The added impetus of the public health movement for control of venereal disease, and especially the attention directed toward syphilis in pregnancy by the numerous state antepartum and premarital Wassermann laws under discussion, will tend of necessity, for a time at least, to direct the treatment of many syphilitic pregnant women away from the medical specialists in this field. While it is undoubtedly true that, with a rare degree of intuitiveness, individualization and attention to detail such as may be expected from the expert it is possible safely to treat syphilitic pregnant women with arsenicals, the facts contained in this study would seem to suggest that it is hardly proper to state that these women tolerate such therapy as well as or better than average.

The fact that these unfortunate symptoms have tended to occur among young patients with early or symptomless syphilis indicates that even with such patients, who if not pregnant would be expected to tolerate active therapy well, it is advisable to administer arsenical treatment cautiously, starting with small doses and gradually increasing them. Moreover, since for the pregnant woman the drug is ordinarily not curative but prophylactic for her child, it would possibly be advisable to give more consideration to adequate preparatory heavy metal therapy before commencing active arsenical treatment, even though one is confronted with an early infection in late pregnancy.

In addition, the question is raised as to whether active arsenical therapy is indicated at all during pregnancy unless there is reasonable assurance that the prospective infant has a strong chance of being diseased.

REDUCTION OF MATERNAL MORTALITY IN CLEVELAND

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CLEVELAND

Has there been an actual reduction in the maternal mortality rate in Cleveland or only a fictitious one? The answer requires a critical analysis of all the factors involved: socio-economic conditions, completeness of vital statistics, changes in classification, medical and nursing technics and adequacy of hospital facilities. Changes in the birth rate and movements of population also enter into the problem.

Prior to 1931 Cleveland, in company with other cities of comparable size, exhibited considerable variation from year to year in official maternal mortality rates (table 1). The rate varied irregularly from 4.3 to 7.2 deaths per thousand registered live births. Careful analysis of the vital statistics for the period from 1910 to 1930 indicates, as the main factors which account for

TABLE 1.—*Maternal Mortality (Number of Deaths from All Puerperal Causes per Thousand Live Births) in the Thirteen Largest Cities of the United States, 1928-1937*

According to data furnished by the United States Bureau of the Census.*											
City	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	
Baltimore.....	6.8	5.8	6.1	7.7	5.9	5.5	6.2	6.3	4.9	3.4	
Boston.....	7.2	7.1	7.6	8.2	7.3	7.1	5.7	5.7	5.6	4.1	
Buffalo.....	7.5	7.9	6.8	9.3	7.8	8.1	8.2	6.0	6.7	4.2	
Chicago.....	5.6	6.5	5.1	4.9	5.2	5.0	4.8	4.0	4.3	3.3	
Cleveland.....	6.1	6.7	6.5	7.2	5.7	6.2	5.4	6.1	4.0	3.7	
Detroit.....	7.0	7.1	6.6	6.2	6.9	7.0	5.5	6.4	5.2	3.5	
Los Angeles.....	6.5	6.4	6.5	9.2	6.8	6.4	5.1	6.2	5.8	4.3	
Milwaukee.....	6.4	5.2	5.2	4.9	3.8	4.7	4.2	3.5	3.1	4.0	
New York.....	5.4	5.2	5.3	5.8	5.6	6.2	4.9	5.3	4.7	4.0	
Philadelphia.....	6.6	7.4	6.4	6.8	6.6	5.2	5.8	5.2	5.8	3.8	
Pittsburgh.....	9.2	8.5	8.8	8.6	8.7	6.3	8.3	7.4	5.7	4.2	
St. Louis.....	6.1	6.2	5.6	7.0	5.7	5.5	6.9	4.3	5.2	3.9	
San Francisco.....	5.5	6.5	5.1	5.1	4.5	3.2	4.3	4.2	2.6	3.7	

* 1937 rates based on data furnished by each city.

this irregularity, (1) incompleteness and irregularity in the reporting of births and the misinterpretation of stillbirths, (2) a declining birth rate due to later marriages, contraception and induction of abortions, (3) inaccuracy in reporting the causes of maternal mortality and obscuring of puerperal deaths under classifications which do not readily reveal the puerperal nature of the disease, (4) changes in obstetric technics and nursing procedures, (5) availability and acceptance of antepartum care and instruction, (6) availability and use of well equipped hospitals, (7) intercurrent epidemics of diseases such as influenza, which bear most heavily on puerperal women, and (8) fundamental changes in the socio-economic order.

Before 1931 little attention was paid to underlying conditions influencing maternal mortality rates. In 1931 the Cleveland Child Health Association undertook a complete and detailed study of every puerperal death occurring in Cleveland. This study¹ revealed the following facts:

1. Deaths due to abortion made up one third of the puerperal deaths in 1931; in over 70 per cent of the

Read before the Child Hygiene Section of the American Public Health Association, Kansas City, Mo., Oct. 26, 1938.

1. Bolt, Richard A.: Maternal Mortality Study for Cleveland, Ohio, Am. J. Pub. Health 23: 109 (Feb.) 1933; Maternal Mortality Study for Cleveland, Ohio, Am. J. Obst. & Gynec. 27: 309 (Feb.) 1934.

cases sepsis was the primary cause of death. In classifying puerperal deaths a distinction should be made between those involving a viable and those involving a nonviable fetus, a convenient dividing line being placed at from twenty-six to twenty-eight weeks of uterogestation.

2. Puerperal sepsis, the toxemias and hemorrhages were the major causes of death and were associated largely with hurried, operative and bizarre obstetrics.

TABLE 2—Principal Causes of Puerperal Deaths, Arranged in Order of Their Importance, Cleveland, 1930-1937

According to an analysis of the Cleveland Hospital Obstetric Society		
	Number of Deaths	Percentage of Total
1 Abortion	171	22.51
2 Postpartum infection	103	15.37
3 Late toxemia	50	11.94
4 Hemorrhage	60	8.95
5 Ectopia	49	7.31
6 Other causes	41	6.12
7 Septic embolus	34	5.75
8 Heart disease	30	4.48
9 Early toxemia	29	4.41
10 Antepartum pneumonia	26	3.88
11 Shock	20	2.95
12 Postpartum pneumonia	19	2.83
13 Anesthetic	14	2.09
14 Nonseptic embolus	11	2.09
Total number of puerperal deaths	670	100%

3. The maternal mortality rates varied markedly from hospital to hospital, depending on the nature of the hospital, composition of the staff, routines employed and selection of cases. The hospitals giving only maternity care showed the lowest rates. General hospitals with properly equipped and isolated maternity wards or private pavilions had the next lowest rates. The City Hospital, to which all types of patients are referred, including a considerable number of Negroes and persons from the lower economic areas, had the highest maternal mortality.

4. The midwife played a very small part in contributing to the puerperal death rate.

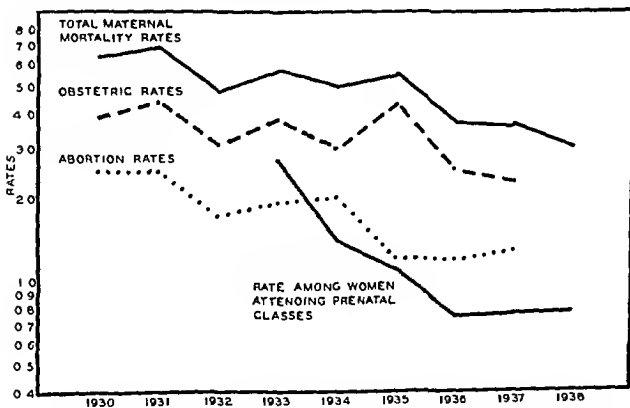


Chart 1—Maternal mortality, Cleveland, 1930-1938 (rate per thousand live plus still births), total city rates compared with rates for women attending antepartum classes

5. The lack of antepartum care in the great majority of cases and the failure to give simple instructions in maternal hygiene was impressive. In the case of only about a third of the viable births could it be said that adequate antepartum care had been given.

There had been considerable improvement in the registration of births in Cleveland during the twenty-five years prior to 1931, so that in 1931 it was estimated that at least 98 per cent of all births were registered.

At present approximately 99 per cent of all births are registered. However, there still remained considerable room for improvement in the medical certification of the causes of puerperal deaths, especially as to the relative importance of primary and secondary causes. Our study revealed that in more than 30 per cent of the cases the cause of death was not stated properly on the death certificate so as to facilitate exact classifications. A check of the death certificates of every woman dying between the ages of 15 and 45 revealed that 28 per cent more deaths occurred from causes connected with childbirth than could be discovered through the office reports.

In many cases it was not possible to discover the exact cause of death without an intimate study of the personal, clinical, hospital and nursing history. This of course required the closest cooperation from hospital doctor and nurse. The information could be obtained more readily when the death occurred in a hospital, but it was possible to secure fairly accurate information when the patient was delivered by a private physician in the home and even in the midwives' cases and those in which the coroner was involved.

March 29, 1933, the results of this study were presented to the Obstetrical and Gynecological Section of the Cleveland Academy of Medicine. The Academy of Medicine and the Division of Health took an active interest in them. A number of the chiefs of obstetric divisions of the Cleveland hospitals came together for mutual counsel

as to what should be the next steps in the program. The feeling was expressed that if representatives from the obstetric staffs of each of the major hospitals would meet regularly and bring before the group case histories of women dying in hospitals from any puerperal cause, these could be discussed freely item by item and a careful analysis made of all contributing factors. This would lead naturally to an appraisal as to the preventability or nonpreventability of the puerperal deaths.

Out of the deliberations of this group arose the Cleveland Hospital Obstetric Society. The society adopted a classification of puerperal deaths based mainly on the clinical history. The causes of death are listed under sixteen different items, with qualifying classifications to clarify the factors associated with the death. Deaths

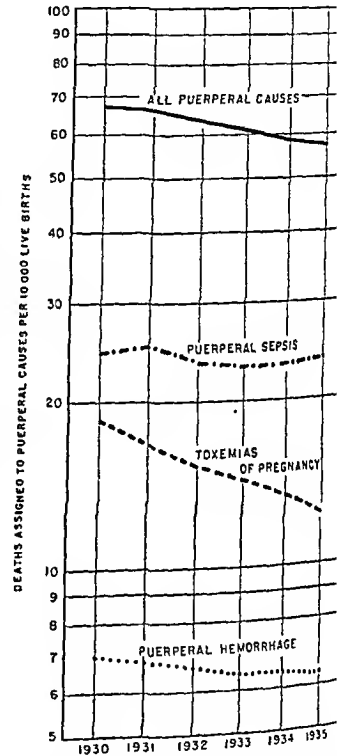


Chart 2—Maternal mortality, 1930-1935 for the United States birth registration area of 1930 (the entire United States except South Dakota and Texas), deaths assigned to puerperal causes per 10,000 live birth. Charts 2 and 3 are from the Children's Bureau, United States Department of Labor, source, United States Bureau of the Census

following abortions prior to six and one-half months of pregnancy are differentiated from those which occur when the fetus is viable, the so-called obstetric deaths. The toxemias are divided into early and late toxemias, and emboli are designated as nonseptic or septic. Antepartum and postpartum infections are separated whenever possible (table 2). A study has been made of the

in various sections of Cleveland for service to mothers in the lower economic levels. These clinics have made possible excellent antepartum medical and nursing services and care at delivery in Maternity Hospital, City Hospital or the patient's home. They reach approximately one third of all child-bearing women in Cleveland each year.⁴

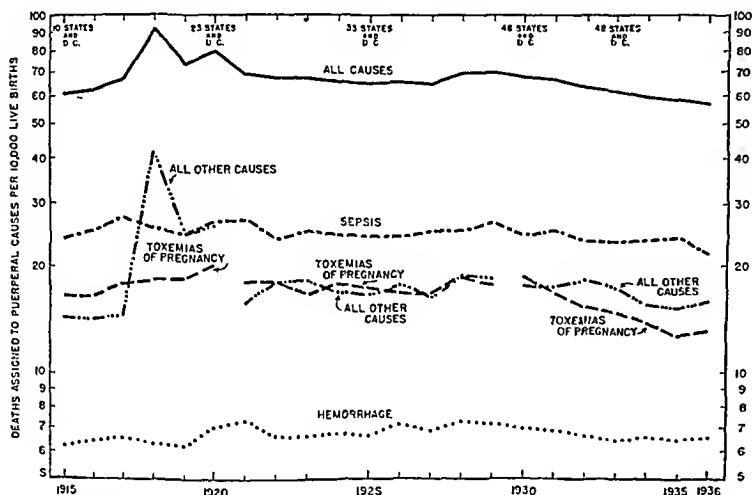


Chart 3.—Maternal mortality by cause, 1915-1936 (United States expanding birth registration area); deaths assigned to puerperal causes per 10,000 live births. The breaks in the lines are due to changes in the conditions included in the international list titles.

deaths in cases in which disease was proved to exist on entrance to the hospital.²

In 1934 a statewide organization was formed. The Hospital Obstetric Society of Ohio held its first regular meeting in Columbus, May 5, 1934. The program and recommendations presented by its president were adopted as guiding principles for each of the hospitals subscribing to its standards. July 21, 1937, the society adopted obstetric standards for group 1 and group 2 hospitals to strengthen the setup in the various hospitals, making for better administration, housing, staff arrangements and follow-up of all obstetric patients.³

The forty-five hospitals now members of the Ohio society prepare detailed monthly reports. The Bureau of Child Hygiene of the Ohio Department of Health has attached a statistician from its staff to the society to devote his full time to the study and classification of the reports dealing with the exact causes of deaths associated with pregnancy. It is hoped that the correlation of the known facts will lead to preventive measures which will save many lives.

There is no question that the efforts of the society have been instrumental in improving the practice of obstetrics in hospitals throughout the state. It must be clearly understood, however, that even before its organization Cleveland had an ample number of obstetric beds in well conditioned hospitals, the services being under competent supervision. The midwife had played only a minor part in maternal mortality, as the percentage of midwives' cases had decreased gradually from 6 in 1930 to 1 in 1937.

For many years the Maternity Hospital, now one of the university hospitals of Cleveland and the teaching obstetric hospital for Western Reserve University School of Medicine, has maintained antepartum centers

The Visiting Nurse Association of Cleveland also has played a prominent part in the maternity program for many years. It sends out trained nurses to render service in the home, free to those who can pay nothing and part pay and full fee to those who can afford fees. Pregnant women are referred to the Visiting Nurse Association through private physicians, relief agencies, insurance companies, the Maternity Hospital Dispensary and sometimes by the family itself. The association follows up all postpartum calls for Maternity Hospital.

Antepartum calls of visiting nurses to patients of private physicians usually come late, as the family frequently does not call the doctor until the later months of pregnancy. The value of this service is enhanced when the physician refers his patient early. The services were organized primarily to care for the individual needs of the patient and to give individual instruction.⁴

There has been another community-wide development—group instruction of expectant mothers—which undoubtedly has played a material part in the reduction of maternal mortality in Cleveland.⁵ In large antepartum clinics physicians and nurses find little time to give individual instruction. It was felt that instruction

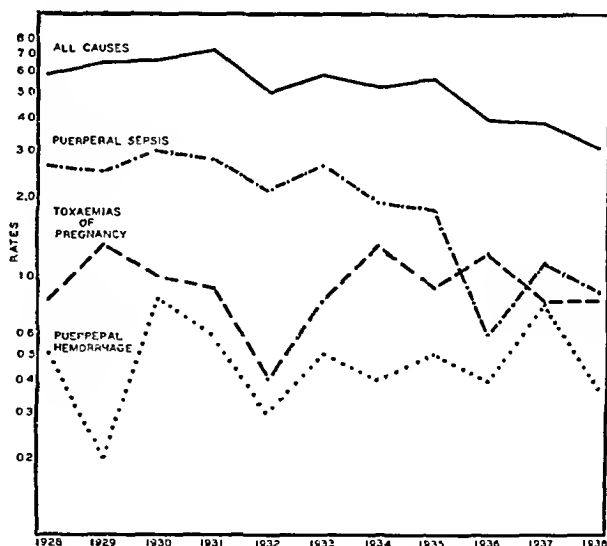


Chart 4.—Maternal mortality, Cleveland, 1928-1938; rates per thousand live births.

which might be given to women in groups would have a distinct bearing on the cooperation with the physicians and greater regularity of attendance at the antepartum clinics and secure closer check-ups at delivery than otherwise might be the case. Accordingly, in 1922

2. The Classification of the Hospital Obstetric Society of Ohio (mimeographed), obtainable from Dr. Scott C. Runnels, Secretary, Ohio Hospital Obstetric Society, 9400 Euclid Avenue, Cleveland.

3. Obstetrical Standards for Group I and II Hospitals (printed sheet), obtainable from Dr. Runnels.

4. Maternity Care for Cleveland Women, Child Health Bull. 5:1 (Jan.) 1938; Cleveland, Cleveland Child Health Association.

5. Goldston, Iago: Maternal Deaths—The Ways to Prevention, New York, Commonwealth Fund, 1937, appendix, pp. 94-110.

antepartum group instruction was instituted by Mrs. Ellen D. Nicely, nurse director of clinics, in the antepartum clinics of the University Public Health Nursing District.

The time of groups of mothers who were waiting their turn to interview the doctor in the clinic was occupied in listening to the nurse explain in simple language matters of hygiene, nutrition, clothing and infant care. This program was developed further under the Cleveland Health Council and the Maternity Hos-

private physicians. No patient is accepted without an admission card signed by her physician signifying his approval. Patients of more than 300 private physicians have registered in the classes in the past five years.

An important feature of this development has been the mothercraft classes, in which the women are taught to make practical layettes at small cost. If a mother has some special problem, the instructor arranges time for a personal conference. Sometimes fears or superstitions trouble the mother and she is too timid to consult her doctor. In such cases the instructor tries to put her in a proper frame of mind to consult her physician. Our experience has been that these classes and personal conferences are of great value, as they ease the mind of the expectant mother, giving her a clear picture of what is before her and of many things that have appeared vague. Furthermore they make possible a check of her simple disorders and unfavorable signs and place the instructor in a position to refer her immediately to her family physician or obstetrician for observation and treatment.

Year by year the women are coming to the classes earlier in pregnancy and are attending more and more of the lectures. In the past five years there has been a gain from 11 to 17 per cent in the number of women registering in the classes during the first three months of pregnancy and a gain from 58 to 65 per cent in the number registering before the seventh month.

About 94 per cent of the patients of private physicians in the classes are primiparas, and they of course are exposed to the greatest obstetric risks. About 40 per cent of the patients of clinics are primiparas.⁷

Experience has led to the belief that the first consideration in any program for the reduction of maternal

TABLE 3.—Living Births According to Place of Birth (at Home or in a Hospital) Cleveland, 1930-1937

Year.....	1930	1931	1932	1933	1934	1935	1936	1937
Total for city.....	17,895	16,270	15,122	13,716	14,225	14,566	14,354	14,745
Total at home*.....	7,416	6,516	5,764	5,237	4,822	4,430	3,882	3,358
Total at a hospital... 10,479	9,753	9,358	8,479	8,479	9,403	10,136	10,472	11,387
At maternally hospitals (exclusively)...	3,732	3,519	3,151	2,931	3,147	3,310	3,225	3,732
1.....	64	71	90	160	227	328	351	341
2.....	25	11	14	15	9	13	16	14
3.....	57	32	50	49	31	43	45	62
4.....	2,293	2,057	1,876	1,732	1,793	1,855	1,819	1,993
5.....	20	16	15	29	16	5	4	0
6.....	1,255	1,332	1,106	1,009	1,065	1,061	1,091	1,322
At general hospitals with maternity licenses.....	6,738	6,235	6,199	5,472	6,236	6,813	7,112	7,619
7.....	..	..	..	..	..	..	..	38
8.....	56	19	..	..	..	..	..	..
9.....	856	832	1,465	1,391	1,356	1,491	1,336	1,332
10.....	65	56	65	40	67	68	61	78
11.....	11	12	8	6	6	3	2	4
12.....	91	73	65	49	51	48	63	32
13.....	36	19	22	22	25	18	20	23
14.....	174	362	419	313	446	493	607	693
15.....	26	25	7	5	..	..	..	..
16.....	377	371	374	274	397	377	451	445
17.....	24	31	1	..	..	..	..	..
18.....	311	272	212	169	237	403	447	600
19.....	249	237	240	222	276	131	(700)†	(1,002)†
20.....	514	485	583	431	575	600	716	803
21.....	635	562	561	447	583	630	669	637
22.....	..	..	..	..	..	..	..	1
23.....	..	..	..	..	..	..	..	50
24.....	..	..	..	..	..	..	..	69
25.....	188	217	205	160	187	226	272	310
26.....	152	131	63	87	106	74	33	..
27.....	824	737	660	667	614	617	717	780
28.....	1,183	1,192	978	818	921	1,097	1,365	1,379
29.....	663	429	418	338	366	338	363	375
At nonmaternity hospitals.....	9	9	8	13	20	13	5	6
30.....	1	1	2	1	1	2	0	2
31.....	3	1	2	..	1	3	2	2
32.....	1	..	..	..	..	..	..	..
33.....	..	..	..	..	..	..	..	..
34.....	1	2	1	1	1	1	..	..
35.....	1	2	1	5	15	2	1	2
36.....	2	1	1	3	1	4	2	..
37.....	..	..	..	1	..	..	..	..
38.....	..	2	1	2	1	..	..	..

* "Other" cases included under "total at home."

† Moved to East Cleveland Aug. 13, 1935, and therefore not included in totals for city of Cleveland.

‡ Closed in 1937.

pital, and in 1932 it came under the direction of the Cleveland Child Health Association, where it has developed rapidly.

It began to be recognized that group instruction in antepartum care was just as important for the patients of private physicians as for those attending the clinics. In 1933 an experimental class for private patients was organized by the Cleveland Child Health Association in the headquarters of the Academy of Medicine of Cleveland. This proved immediately successful, and several more such classes were opened in other sections of the city. Since 1933 the antepartum lectures and craft classes have been open to any woman in greater Cleveland who wishes to avail herself of their advantages. At present 100 classes a month are being conducted, forty for the patients of private physicians and sixty for patients at clinics.

The Academy of Medicine of Cleveland has assumed joint sponsorship of the classes⁶ for the patients of

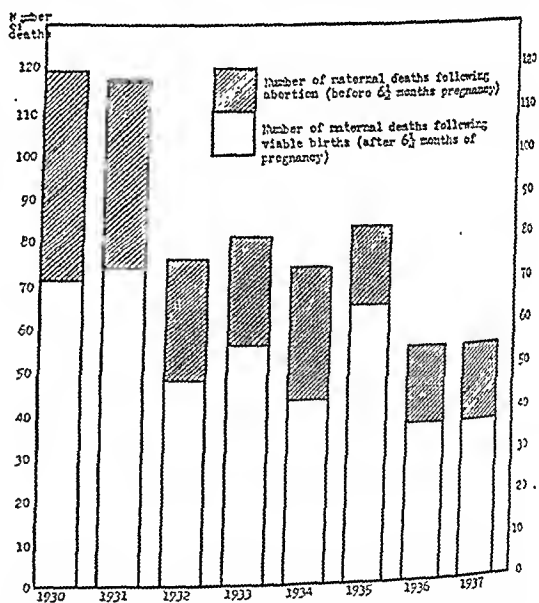


Chart 5.—Number of maternal deaths, Cleveland, 1930-1937 (total deaths, obstetric deaths and deaths due to abortion).

mortality is the puerperal woman herself. Her ability to choose a skilful physician, a competent nurse and a well conditioned hospital are of vital importance. Her capacity to grasp and to carry out simple hygienic rules and her teachability as to the importance of symptoms and signs which indicate approaching danger are large factors. Group instruction in antepartum care, given

6. Prenatal Classes Approved, Bull. Acad. Med. Cleveland 19:7 (April) 1935.

7. Evaluation of the Prenatal Group Instruction Program in Cleveland, Ohio (mimeographed), Cleveland, Cleveland Child Health Association, 1938.

by competent public health nurses under the direction of a physician, is proving a successful method of reaching and teaching these essentials to the expectant mother.

When one segregates the women who attended the antepartum classes in Cleveland from the total number of women confined in the city, one finds that the maternal mortality rate in 1933 for the former group was 28 deaths per thousand live plus still births and for the women not attending the classes was 5.9. In 1937 the rate for the 2,524 women from the antepartum classes who were confined was only 0.78, as compared with a rate for those not attending the classes of 4.2 deaths per thousand live plus still births (chart 1).

A factor of equal if not greater importance is the type of physician selected to conduct the woman safely through her pregnancy. So long as there are physicians who have been poorly trained and who are making midwifery only a small part of their general medical

care. *Failure of proper lay cooperation is responsible for about 50 per cent of the preventable deaths among mothers*" (italics by author).

Comparison of statistics in the 1931 Cleveland study with recent figures furnished by the Academy of Medicine reveal that there has been a trend in Cleveland away from the general practitioner who handles few cases to the physician with a large obstetric practice and to the obstetrician.

The next important factor in the prevention of maternal mortality is the well equipped and properly staffed maternity hospital or maternity division of the general hospital, competently administered under safeguards such as those laid down by the Ohio Hospital Obstetric Society.³ Studies in Cleveland clearly indicate that the improvements in hospital facilities, in better coordination of visiting and courtesy staffs and in the setting up of high obstetric standards have accompanied the reduction in maternal mortality. One general hospital, which was formerly in Cleveland, has moved to

TABLE 4.—Maternal Mortality by Cause, Cleveland, 1928-1937

	International Classification of 1920				International Classification of 1929					
	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
All causes	104*	113*	119*	117*	76	81	74	83	55	55
Puerperal sepsis	47	43	53	47	32	36	23	26	9	15
140 Abortion with septic conditions	*	*	*	*	18	12	16	11	4	12
142a Ectopic gestation with septic conditions specified	*	*	*	*	0	2	2	0	1	0
145 Puerperal septicemia and pyemia (not specified as due to abortion)	47*	43*	53*	47*	14	22	10	15	4	3
All other puerperal causes	57	70	66	70	44	45	40	57	46	40
141 Abortion without mention of septic conditions (to include hemorrhages)	8	6	4	10	5	3	5	7	3	2
142b Ectopic gestation without mention of septic conditions	6	4	9	6	5	2	6	3	4	1
143 Other accidents of pregnancy (not to include hemorrhages)	1	1	1	2	0	0	0	0	0	0
144 Puerperal hemorrhage	10	3	14	10	0	3	1	3	1	5
(a) Placenta previa					5	4	4	4	5	6
(b) Other puerperal hemorrhages	14	23	18	15	3	5	7	6	10	10
146 Puerperal albuminuria and eclampsia	*	*	*	*	3	5	8	7	5	2
147 Other toxemias of pregnancy	5	11	8	11	7	12	6	10	3	4
148 Puerperal phlegmasia alba dolens, embolus, sudden death (not specified as septic)	3*	8*	6*	9*						
149 Other accidents of childbirth	7*	12*	6*	5*	10	4	3	8	5	5
(a) Cesarean operation	3*	1*	0*	1*	5	5	6	7	10	5
(b) Others under this title	0	1	0	1	1	1	0	2	0	0
150 Other and unspecified conditions of the puerperal state										

* Cannot be compared on account of change of classification

practice, thus having too few deliveries each year to give them experience in handling the more difficult and complicated ones, there will continue to be high rates. So long as the impression is given that a woman will receive adequate and skilful attention from any physician, just so long will there be complications. It is obvious that physicians having only ten or fifteen obstetric patients a year and hospitals in which less than 150 obstetric patients are confined each year cannot give all the detailed and skilful attention necessary in obstetric practice, especially to patients in whom complications develop.

Dr. Fred Adair⁸ and his colleagues have pointed out recently the principles of management of some of the more serious complications of pregnancy. A study of these complications impresses one with the fact that had the women been in the hands of competent obstetricians from the earliest possible date in their pregnancies a considerable number of the complications would not have occurred and the maternal death rate would have been materially lowered. Dr. Adair stated that "women must be properly instructed in personal care and must be taught to cooperate with and appreciate the doctor who is trying to give good antepartum and delivery

East Cleveland and developed a large obstetric division. There has been a trend toward more confinements in the larger, better equipped hospitals.

As a result several smaller hospitals have gone out of business or ceased to take obstetric patients. In 1931, 60 per cent of all registered births in Cleveland occurred in hospitals, while in 1937 the percentage had increased to almost 80 (table 3).

However, one must not lose sight of the fact that the mortality for normal obstetric patients delivered in their own homes by well qualified and experienced physicians remains remarkably low. The experience of the outpatient delivery service of Maternity Hospital in Cleveland reveals a similar low mortality for the patients delivered at home. A hospital may be the safest or the most dangerous place to have a baby, depending on the conditions mentioned. This does not militate against the organization of obstetric services in hospitals, as it is well known that the patients with difficult and complicated labor and a large proportion of primiparas are referred from home service into hospitals.

The physical and mental condition of the prospective mother has roots which reach back into early life and which are conditioned by heredity, disease affecting the bony system, especially of the pelvis, and disease affecting the circulatory, respiratory or endocrine sys-

⁸ Adair, F. L. • Maternal Care Complications, Chicago, University of Chicago Press, 1938, p 74

tems. It is evident that a woman coming into pregnancy with a damaged heart or kidneys, with chronic tuberculosis or with a toxic thyroid will be a poor risk regardless of the medical, nursing and hospital attention given to her. Furthermore, a woman with a contracted pelvis due to rickets or achondroplasia already presents complications which may have to be dealt with operatively, and it is known that operative procedures increase risks. Therefore public health measures which reduce any of these hazards will add to the safety of the puerperal woman.

Another practical consideration in the obstetric situation is the financial ability of the family to meet the expenses for the physician and nurse for the confinement and for hospital care when that is desirable or essential. In Cleveland prospective mothers of the upper economic levels have been able to secure proper instruction in maternal hygiene and skilful medical, nursing and hospital attention. This group on the whole has the lowest birth rate and the lowest maternal mortality. Those in the lower economic levels and those on relief have been able to secure good obstetric service

TABLE 5—*Puerperal Death Rates per Thousand Live Plus Still Births Cleveland, 1930-1937*

Year	Live Births	Still Births	Total Births	Total Puerperal Deaths	Rate
1930	17,895	503	18,600	119	6.4
1931	16,279	507	16,876	117	6.9
1932	15,122	501	15,713	76	4.8
1933	13,716	491	14,207	81	5.7
1934	14,225	520	14,745	74	5.0
1935	14,546	449	15,015	83	5.5
1936	14,151	476	14,627	55	3.7
1937	14,445	443	15,188	53	3.6

Year	Obstetric Deaths (After 6½ Months)		Deaths Due to Abortion (Before 6½ Months)		Rate
1930	71	29	48	25	119
1931	71	44	41	25	117
1932	48	11	28	17	76
1933	76	38	25	19	81
1934	41	10	51	20	74
1935	65	43	38	12	83
1936	37	23	18	12	55
1937	37	23	18	13	53

through the Maternity Hospital outpatient department and through the maternity service at City Hospital.

On the other hand, a considerable number of prospective mothers in the middle class have found it extremely difficult to meet the expenses of a pregnancy. It is for this group, in which the husbands or the women themselves are employed as workers in shops, factories or stores, that the Hospital Service Association's provision for hospitalization of parturient women is a great boon. More than 155,000 persons are insured in the association plan, which allows twenty-one days of hospital care a year in one of sixteen approved Cleveland hospitals for a monthly premium of from 60 to 75 cents. April 1, 1938, the service was extended to include confinements for those participating in the plan for more than a year. In October the service was extended further to include the entire family. I am confident that in a few years, when full advantage is taken of these provisions, there will be a still further reduction in the maternal mortality rate in Cleveland. There will be greater improvement in technic in hospitals taking obstetric patients under the plan and a more judicious selection of obstetricians by the patients, who will plan early in pregnancy for confinement in one of these hospitals.

Unless the prospective mother can be impressed with the importance of an early choice of a skilful and con-

scientious physician and it is made possible for her to choose a physician from among the most competent obstetricians in the community, and unless it is made possible for those in the lower economic levels to obtain adequate medical, nursing and hospital care, a material reduction in maternal mortality rates cannot be expected. There may be adequate hospital facilities, a large enough number of physicians and obstetricians in the community and all the necessary nursing facilities, yet, if these cannot be brought to bear directly on the prospective mother at every economic level, other efforts will prove fruitless. The maternal mortality rate will be reduced only in proportion to the community organization which assures the coordination of all these forces.

Accurate reporting of births and deaths is essential to any appraisal and comparison of mortality rates. It must be recognized that a comparison of the rates of one city with those of another and with state and national statistics requires careful interpretation. In the state department of health a reclassification of data submitted by cities may take place because of differences in interpretations and the system of tabulation. By actual comparison it was found that the official rates submitted by cities differed slightly from those furnished by the United States Bureau of the Census in practically all instances. In a comparison of the maternal mortality rates in cities over a period of years, the official rates as issued by the Bureau of the Census are the only ones that are comparable.

Since the adoption of the "1929 International Classification of Causes of Death" by the Cleveland Bureau of Vital Statistics (in 1931) it has been possible to secure the segregation of abortions accompanied with septic conditions from abortions without mention of septic conditions. Other improvements have been made in that classification, but it still does not cover all the points necessary to a complete evaluation of the preventability of maternal deaths. However, the Cleveland Bureau of Vital Statistics has made marked strides in the direction of securing completeness of registration of puerperal deaths, especially in the hospitals, through the cooperation of the Hospital Obstetric Society, and also has checked all cases of obscure causation, so that today the picture from official sources is much more reliable than it was prior to 1931 (table 4).

With the demographic studies of Howard Whipple Green⁹ in connection with economic areas in census tracts, one is able to evaluate socio-economic factors entering into the problems of maternal and infant mortality. The data all lend greater reliability to the Cleveland figures for the past eight years and make a comparison of trends more reliable.

The birth rate has varied but little in Cleveland since 1933. The character of the population has remained about the same, although there have been fluctuations in the number on direct and on work relief. There have been no serious epidemics that might have affected the maternal mortality.

As a result of the studies made of maternal mortality, it may be stated that there was no demonstrable downward trend in the official puerperal mortality rate in Cleveland from 1910 to 1931, the yearly rate fluctuating irregularly between 4.3 and 7.2 deaths per thousand live births. From 1931 to 1938 there was a decided downward trend in the maternal mortality rate, with minor yearly fluctuations, from 7.2 in 1931 to

⁹ Green, Howard W.: Demographical Data, Cleveland, Ohio, 1931 to 1937, Cleveland, Cleveland Health Council, 1938

3.7 in 1937 and 2.9 for the first seven months of 1938. One may reasonably compare the rates since 1930, and especially since 1933 (table 1), because it is known that the registration of births and deaths has become more complete, that the classification of causes of death has become more exact and that more detailed studies of hospital deaths have taken place (table 4).

If the classification of the Cleveland Hospital Obstetric Society is adopted, the favorable change in rates is brought out even more clearly. In 1931 the rate per thousand live plus still births for patients more than six and one-half months pregnant was 4.4, while the rate for those dying before they were six and one-half months pregnant, this figure, including all deaths registered as due to abortion, was 2.5. In 1937 these rates had dropped to 2.3 and 1.3 (table 5 and chart 5).

The answer then to the question as to whether there has been an actual reduction of maternal mortality in Cleveland is Yes. It remains to state that maternal mortality rates in other large cities have been falling to new lows. There has been a general decline in the maternal mortality rates throughout the country. It would be valuable to have the experiences of other cities analyzed and presented to the American Public Health Association.

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FACTORS ASSOCIATED WITH FETAL AND NEONATAL DEATHS

ANALYSIS OF 773 SUCH DEATHS OCCURRING IN
17,728 DELIVERIES AT THE CHICAGO
LYING-IN HOSPITAL

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AND

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CHICAGO

In the past few years there has been an increasing recognition of the need for further investigation of the factors associated with death of the fetus in utero and during delivery and of the infant in the first few days of life. Attention for some time has been focused on the older infant, with the result that deaths occurring in the period from the end of the first month to the end of the first year of life have been greatly reduced (100 per thousand live births in 1915 to 56 per thousand live births in 1935). The death rate in the first month has shown little reduction, while the rate for the first day of life and for stillbirths has remained practically stationary during the entire period since vital statistics on the subject have been collected.

Except for disorders arising from defects of the germ plasma, the welfare of the fetus and of the infant in the period immediately following delivery is largely dependent on the condition of the mother during pregnancy and on the character of labor. It is not until an independent existence has been completely established that pathologic conditions intrinsic in the infant become important lethal factors. The physician therefore must attempt to eliminate any maternal condition which might adversely affect the fetus during the prenatal period and ameliorate any harmful processes occurring during labor if the morbidity and mortality rates are to be decreased.

It is believed that an analysis of conditions associated with fetal and neonatal death in a large series of deliveries in which the maternal complications and obstetric procedures employed are known, not only in those which die but also in those which survive, might enable one properly to evaluate the factors responsible for fetal and infant deaths.

Considerable difficulty is encountered in attempting to group causes of fetal death, and many classifications heretofore published consist of a mixture of fetal and maternal states. Craniotomy (unless performed on a live fetus), maceration, atelectasis and prematurity in stillborn fetuses are not causes of death and should not be listed as such. No single classification of pathologic conditions gives sufficient information with regard to the fundamental factors responsible for death, and it is only by multiple tables that adequate information can be obtained. In attempting to evaluate the various factors associated with fetal and infant mortality, it is important to know the pathologic conditions present in the fetus or infant, the effect that abnormal maternal conditions present before labor have on the fetus or infant, the effect of different types of labor and delivery on the fetus or infant, and the relation of maternal complications, type of delivery and cause of death to the period of gestation at which the fetus or infant is delivered. The causes of death will be presented from each of these points of view.

GENERAL PROCEDURE

The criteria used to determine the age of a fetus or infant are based on Scanmon's figures for weight and length in relation to the menstrual age of the fetus. The fetus is placed in the group in which at least two of the three criteria apply.

I. Abortion:

1. Less than 400 Gm. in weight.
2. Less than 28 cm. in length.
3. Less than 22 weeks (missed abortions are excluded).

II. Premature:

A. Previa:

1. From 400 to 999 Gm. in weight.
2. From 28 cm. to 35 cm. in length.
3. From the 22d to the end of the 28th week.

B. Viable:

1. From 1,000 to 2,499 Gm. in weight.
2. From 35.1 cm. to 47 cm. in length.
3. From the 29th to the end of the 37th week.

III. Term:

1. From 2,500 to 4,499 Gm. in weight.
2. From 47.1 cm. to 54 cm. in length.
3. From the 38th to the end of the 42d week.

IV. Postmature:

1. More than 4,500 Gm. in weight.
2. More than 54 cm. in length.
3. More than 42 weeks.

The law in the state of Illinois requires that the birth of all live infants and of stillborn fetuses which have advanced to the fifth calendar month of gestation be recorded. Therefore the birth of infants delivered between the fifth month and the period of viability (end of the seventh month) must be recorded, and these deaths must be included in the computation of mortality statistics even though there is no chance of a continued existence. Infants at the end of the seventh month weigh about 1,000 Gm. Many hospitals accept 1,500 Gm. as the lower limit of viability and disregard in statistical reports all infants below this weight. Dunham and her associates, however, found

in a study of more than 5,000 premature infants that, although 98.8 per cent of all infants weighing less than 1,000 Gm. at birth failed to survive, 35 per cent of those between 1,000 and 1,500 Gm. did survive. The deletion of this group of infants from statistical records cannot be justified on the ground that they are previable.

The product of conception is considered stillborn if it shows no sign of life at birth (heart beat, respiration, muscular movement)¹ and live born if the heart is beating when born, even though respiration is never established.

Autopsies have been performed on 68 per cent of the fetuses and infants delivered and dying in the Chicago Lying-in Hospital. Only too frequently autopsy fails to reveal the cause of death, but despite this, post-mortem examination of the infant is as important in determining the absence of pathologic conditions as it is in establishing their presence. The maternal history is an extremely important adjunct to the autopsy protocol, and any statement as to the cause of death based on the summation of knowledge contained in a complete maternal history plus an accurate autopsy protocol is of inestimably more value than an opinion based on one alone.

An attempt has been made to group together closely related pathologic conditions in order to simplify the discussion. Most lesions sufficient to cause death fall into five major groups. They are (1) hemorrhage, either visceral or intracranial, usually caused by trauma, (2) anoxemia, (3) malformations, (4) infections and (5) idiopathic conditions. There are ordinarily no pathologic changes demonstrable in premature infants who die because of insufficient development. In the case of an infant delivered in the previable or viable premature period, prematurity is not given as a cause of death in the absence of pathologic changes, but the fact that it was born in the previable or viable premature period and that no pathologic lesions were found is stated.

Intracranial hemorrhage includes only those cases in which there was definite bleeding into the brain substance or cranial cavity. This bleeding is often associated with laceration of the supporting structures and in most cases is due to actual trauma. When there was slight extravasation of cells into the leptomeninges of the type so commonly seen in association with the extreme congestion produced by anoxemia, the infant was placed in the group dying from anoxemia and not with those having intracranial hemorrhage.

Anoxemia is considered the cause of death only when definite petechial hemorrhages are visible in the lungs, heart, thymus or meninges. Petechial hemorrhages when present in one organ are often present in all organs. They are most characteristic in association with death from premature separation of the placenta but usually occur in any obstruction of circulation through the cord or placenta. When death is due to anoxemia, epithelial cells and vernix caseosa derived from the amniotic fluid are demonstrable microscopically in the alveoli of the lungs in much larger quantities than when death occurs from other causes.

Malformations include only those defects which are in themselves capable of causing death. Even though there may have been coincidental maternal complications the malformation is given precedence as a cause of death over any maternal condition. Erythroblastosis has

been included under this heading, since we believe that it is most probably a congenital maldevelopment of the hemopoietic system.

Infections are an extremely infrequent cause of death and in general are listed individually. Syphilis and pneumonia are the two most commonly encountered, and even these are rare.

Idiopathic conditions may include hemorrhagic disease of the newborn, glycogen storage disease (von Gierke's disease), hypoglycemia unrelated to maternal diabetes, edema of the brain and the like. Except for one case of hemorrhagic disease, edema of the brain was the only one of these conditions found in the present series. It occurred nine times and most frequently followed birth by cesarean section. Most of the infants died with clinical symptoms indicating increased intracranial pressure. It is not known whether death is due to increased fluid, but it seems wise to place these cases in a separate group since they showed no other pathologic changes.

Atelectasis (lack of expansion of the alveoli) has in no case been considered a cause of death. We believe that atelectasis is not the cause but the result of the processes which produce the death of the infant. It would be advantageous if a term could be introduced which would differentiate the atelectasis due to primary nonexpansion of alveoli and secondary collapse of alveoli due to resorption of air. The first is the type most commonly seen in newborn infants; the second is most often found after the first few days of life. Expansion of alveoli is a gradual process, and lungs of infants a few hours old normally contain less air than those several days old. Abnormal lack of expansion may be due to depression of the respiratory center (anoxemia, trauma, narcotics from the maternal circulation, cerebral malformations), local compression of the lungs (diaphragmatic hernia, polycystic kidneys, pleural effusion) or immaturity of the respiratory center, lungs and thoracic muscles. In none of these conditions is the unexpanded condition of the lungs the actual cause of death.

The role that analgesia and anesthesia play in producing fetal or infant death is extremely difficult to determine. The respiratory center of the infant may become so depressed by excessive or ill timed administration during labor that its function is inhibited and respiration sufficiently delayed to cause death. However, no pathologic lesions are ordinarily produced in the infant's body and it is usually impossible to prove that this was the actual cause of death.

GENERAL ANALYSIS

Since the opening of the new physical plant in May 1931 until Jan. 1, 1938, 17,728 infants have been delivered at the Chicago Lying-in Hospital. Of these 402 were stillborn and 371 died either before discharge from the hospital, or within ten days after birth. This is a total death rate of 21 per thousand live births and a stillbirth rate of 23 per thousand live births.

General Mortality in Relation to Age at Birth.—Among the total infants and fetuses delivered, the great majority (93.3 per cent) remained in utero a normal length of time, and only a small portion (5.8 per cent) were delivered during the viable premature period. Less than 1 per cent (0.5 per cent) additional were previable. The mortality for infants and fetuses at term is only 1.9 per cent, but for those born prematurely it is increased eighteen fold (34.6 per cent) and practically none born in the previable period survive (98.8 per cent).

1. Throughout this paper the term fetus is used to indicate a product of conception born dead at any period of gestation.

Among the infants born alive 94.4 per cent were at term, 5.3 per cent were viable premature infants and 0.3 per cent were previsible. The mortality rate for infants at term is 0.8 per cent, for viable premature infants 18.1 per cent, for previsible infants 96 per cent. Thus the term infant has twenty-one times more chance of surviving than does the premature infant.

A relatively greater proportion of the stillborn fetuses reached term before delivery (47.1 per cent) than did those infants who died in the neonatal period (35.8 per cent). The opposite is true in the viable premature period, for 42.2 per cent of the stillborn fetuses and 50.9 per cent of the infants dying neonatally fall in this group.

Although of all infants and fetuses delivered only 5.8 per cent were viable premature infants and 0.52 per cent were previsible, there were more deaths in these two groups combined than there were among all those who were delivered at term. Only 41.6 per cent of the total deaths were in infants and fetuses at term, while 46.5 per cent occurred among those delivered during the viable premature period and 11.9 per cent were in those delivered during the previsible period.

Time of Death in Relation to Labor in Stillborn Fetuses.—Death occurred before the onset of labor in half (50 per cent) of all stillborn fetuses and during labor in more than one third (35 per cent); the time of death was unknown or not recorded in 15 per cent. Sixty-two per cent of the fetuses that died during labor were at term in comparison to 39 per cent of those that died before the onset of labor. The actual number of term fetuses dying during labor is almost twice that of premature fetuses dying during labor. However, death occurred during labor in 5.1 per cent of the infants and fetuses delivered prematurely who were known to be alive at the onset of labor and in only 0.47 per cent of the infants and fetuses delivered at term. Thus the premature fetus has 10.8 times more likelihood of dying during labor than does the fetus at term.

Extra-Uterine Age at Death.—Of the 371 infants who died after birth, eighty-seven lived less than one hour (in the majority of these normal respiration was never established), 192 lived more than one but less than twenty-four hours and eighty-one lived from one to ten days, while eleven died after ten days. A total of 279, or 75.2 per cent, died within the first twenty-four hours of life. This indicates that some process intimately associated with intra-uterine life, the process of birth or the establishment of an extra-uterine existence was directly responsible for at least three fourths of all deaths.

Type of Delivery in Relation to Total Births.—Among the total infants and fetuses almost two thirds (61.7 per cent) were delivered in a cephalic position without operative procedures other than episiotomy. More than one fourth (27 per cent) were delivered in a cephalic position with the aid of forceps (low forceps in 22.4 per cent, mid forceps in 4.6 per cent). The breech was the presenting part in 4 per cent of all deliveries; cesarean section was the method of delivery in 5.8 per cent, and podalic version with subsequent extraction was performed in 0.9 per cent of all cases.

TYPE OF DELIVERY IN RELATION TO FETAL AND NEONATAL MORTALITY

The gross neonatal mortality (0.89 per cent) is less for cephalic deliveries aided by low forceps than for any other type of delivery. The next lowest figure is

for infants delivered naturally in a cephalic position (1.5 per cent). Other operative procedures are associated with progressively greater mortality; mid and high forceps 2.4 per cent, cesarean section 6 per cent, breech delivery 7.9 per cent, version and extraction 12.9 per cent.

The stillbirth rates follow the same general order of increase in relation to the type of delivery as do the neonatal death rates. In general, except in delivery by version and extraction and by cesarean section there are about an equal number of neonatal deaths and stillbirths in each group. Associated with cesarean sections there are only half as many stillbirths (thirty-one) as there are neonatal deaths (sixty-two), owing largely to the fact that unless the mother's life is at stake sections are not performed when the fetus is dead. The stillbirths (thirty-five) are 50 per cent higher than the neonatal deaths (twenty-three) when delivery is by version and extraction.

Correction of Figures for Conditions Which Are Not Affected by Type of Delivery.—The gross figures appear to indicate that delivery by low forceps has a considerably lower rate than any other type. How-

TABLE 1.—Corrected Mortality Rates

	Gross Mortality, per Cent	Corrected Mortality, per Cent*	Corrected Mortality, per Cent, Adjusted to 5 per Cent Prematurity†
Total deliveries.....	4.4	2.5	2.5
Natural cephalic deliveries.....	3.0	1.0	1.1
Low forceps.....	1.4	1.1	1.3
Mid and high forceps.....	5.0	4.2	5.0
Breech deliveries.....	16.5	0.7	7.1
Cesarean section.....	8.9	6.5	4.1
Version and extraction.....	34.5	22.3	13.4

* Deletion of all infants and fetuses dying before the onset of labor, before the period of viability or from malformations.

† 0.05 times the death rate for prematures in each type of delivery plus 0.95 times the death rate for term infants in each type of delivery.

ever, since the delivery itself can have no effect on deaths occurring before the onset of labor, on those due to major malformations or on those resulting from delivery of the fetus before the period of viability, the deletion of these from the total deaths with recalculation of the rates gives much more accurate information regarding the effect of delivery (table 1). The mortality rate (neonatal deaths and stillbirths combined) thus calculated for natural cephalic delivery (1 per cent) is only one third of its gross rate and is slightly lower than delivery by low forceps (1.1 per cent). Although the total rate in each type of delivery is lowered, in each it is lowered proportionately less than in spontaneous cephalic deliveries, so that in relation to this type of delivery other methods have a greater hazard than is indicated by the gross figures.

Even after these calculations are made there still remain the variations in the number of premature births in each group as factors affecting the death rates. The mortality rate for premature fetuses and infants is approximately eighteen times that of those at term, so that a large number of premature infants in any one group makes the figures for that type of delivery disproportionately high. Since among the live born infants delivered in the hospital 5 per cent are premature, adjustment of the number in each type of delivery to 5 per cent eliminates prematurity as a factor causing variation in the death rates. After the previsible, malformed and those dead before the onset of labor have

been eliminated and the adjustment made for prematurity, the corrected rate is slightly raised for natural cephalic (1.1 per cent), low forceps (1.3 per cent) and mid forceps (5 per cent) deliveries and lowered for breech (7.1 per cent), cesarean section (4.1 per cent) and version and extraction (13.4 per cent). Thus delivery by low forceps has a slightly higher rate than natural cephalic delivery, while mid forceps is four and one-half times as high, breech six and one-half times, cesarean section a little more than three and one-half times and version and extraction twelve times as high.

Natural Cephalic Delivery.—Of the 10,877 infants and fetuses born by natural cephalic delivery, 1.5 per cent were stillborn and 1.5 per cent died in the neonatal period. Only one third were at term (term 33 per cent, viable premature 52.4 per cent, previable 14.2 per cent). In each of the age groups there were approximately an equal number of stillbirths and neonatal deaths. Maternal complications were associated with fetal or neonatal death in 57 per cent of the stillborn and in 32 per cent of the live born infants. The most common complication was toxemia, which occurred in 27.6 per cent of the mothers of stillborn fetuses and 10 per cent of those infants who died in the neonatal period. Hemorrhage from placenta praevia or premature separation of the placenta occurred with the next greatest frequency and was associated with 15.2 per cent of the stillborn fetuses and 5.7 per cent of the live born infants who died in the neonatal period.

Investigation of the pathologic lesions at autopsy reveals the startling fact that 38.6 per cent of the live born infants and only 10.3 per cent of the stillborn fetuses died as a result of major malformations. If only infants at term are considered, 67 per cent of those live born died of malformations while 14.6 per cent of the stillborn fetuses died of the same cause. Thus in live born infants who are delivered without instrumentation the most important lethal factor is a major malformation.

In addition to malformations, the most common pathologic lesions in infants dying during the neonatal period are intracranial hemorrhage 12 per cent and anoxemia 12 per cent. Ninety-two per cent of the previable infants, 39 per cent of the premature infants and only 4 per cent of the infants at term showed no pathologic changes.

The other conditions found at autopsy in stillborn fetuses were anemia 11.2 per cent, intracranial hemorrhage 1.7 per cent, intra-uterine pneumonia 1.7 per cent and no demonstrable pathologic changes 73.4 per cent. Slightly over half (51.7 per cent) of the fetuses examined at autopsy were macerated.

The majority (85 per cent) of the fetuses born of mothers with no known complications were macerated; they were macerated in slightly less than half of those in which there was an associated toxemia (42.4 per cent) and in only 29 per cent of those associated with placenta praevia or abruptio placentae. This indicates that intra-uterine deaths associated with no known maternal complications usually take place hours or days before delivery; those associated with toxemia occur before the onset of labor and during labor with about equal frequency, while the greatest number of deaths associated with maternal hemorrhage occur only a short time before delivery.

Cephalic Delivery Aided by Forceps.—Among the 3,995 deliveries in which low forceps were used there were 0.55 per cent stillbirths and 0.87 per cent live

born infants who died during the neonatal period. Maternal complications were present in association with 52 per cent of the deaths in this group in contrast to 44 per cent in natural cephalic deliveries. Seventy per cent were at term. Causes of death in the thirty-two infants and fetuses examined at autopsy were intracranial hemorrhage 31 per cent, anoxemia 28 per cent, malformations 25 per cent and no abnormalities 16 per cent.

A total of 835 infants and fetuses were delivered by mid or high forceps. Of these 2.6 per cent were stillborn and 2.4 per cent died in the neonatal period. In 45 per cent Dührssen's incisions were made prior to delivery. There were, in the total group, nine mothers showing toxemia and two with abruptio placentae, and in most of the remainder there was difficulty in delivery, the latter due especially to cervical dystocia. Seventeen per cent of the infants and fetuses were premature, 83 per cent were at term. Thirty-two were examined at autopsy. Sixty-five per cent of these showed evidence of birth trauma, 9 per cent died of major malformations, 13 per cent died of anoxemia and 13 per cent showed no pathologic lesions.

In both groups of infants and fetuses examined at autopsy the main cause of death was birth trauma; it accounted for death in 65 per cent of those delivered by mid forceps, 31 per cent of those delivered by low forceps.

Breech Delivery.—A total of 708 infants and fetuses were delivered in a breech position with a resulting mortality of 7.9 per cent during the neonatal period and an incidence of 8.6 per cent stillbirths.

The causes of death demonstrable at autopsy in infants and fetuses delivered in a breech position were anoxemia 20 per cent, intracranial or intraperitoneal hemorrhage 17.4 per cent, malformations 10.6 per cent and infections 4 per cent. In 48 per cent no anatomic cause of death could be demonstrated; this includes the 20 per cent that were macerated, the 17 per cent that were previable and the 11 per cent that were premature or at term that showed neither maceration nor pathologic lesions. Maternal complications were present before delivery in 32.6 per cent of the women whose infants died or were stillborn; toxemia occurred in 12 per cent, hemorrhage due either to placenta praevia or to premature separation of the placenta in 12 per cent and prolapse of the cord in 10.6 per cent.

Delivery by Cesarean Section.—Among 1,041 cesarean sections there were delivered thirty-one (3 per cent) stillborn fetuses and sixty-two (6 per cent) live born infants who died during the neonatal period. Of the total number of infants and fetuses 36.5 per cent were at term, 50.5 per cent were premature but viable and 13 per cent were previable.

The main indication for cesarean section in the cases in which the fetuses were stillborn was hemorrhage due to premature placental detachment; this was present twenty-two (70 per cent) times; seven of these were associated with toxemia. In six (20 per cent) the indication for section was severe toxemia without premature placental separation, in two (7 per cent) central placenta praevia, in one (3 per cent) brain tumor. Twenty-two of the fetuses were examined at autopsy. Fifty-five per cent showed the petechial hemorrhages characteristic of interference with circulation, and in 9 per cent there was intracranial hemorrhage. In 36 per cent there were no pathologic lesions; of these, 23 per cent were so macerated that petechial hemorrhages could not have been identified even if originally present.

The indications for cesarean section in the sixty-two live born infants who subsequently died were toxemia 35.4 per cent, hemorrhage 30.6 per cent (placenta praevia nine, abruptio placentae ten), medical complications 19.5 per cent (heart disease nine, tuberculosis one, diabetes one, epilepsy one), small pelvis 11 per cent (first section two, with previous section five), necrotic fibroid one (1.6 per cent), previous antepartum fetal death one (1.6 per cent).

Forty-four of these infants were examined at autopsy. Twenty-seven per cent of these showed no pathologic lesions (six were viable premature infants, three pre-viable infants). Twenty-one per cent (three term, six premature) had marked edema of the brain without other demonstrable abnormality, 19 per cent had petechial hemorrhages, 16 per cent showed intracranial hemorrhage (three term, four premature), 10 per cent had major malformations, 7 per cent had pneumonia. It is interesting to note that six of the seven cases showing intracranial hemorrhage were cases in which the indication for section was toxemia.

The total 1,041 cesarean sections have been analyzed according to the indications for which they were performed. In considerably over half (60.1 per cent) the indication was disproportion, dystocia or previous cesarean section. The infants were stillborn or died in the neonatal period in only 1.1 per cent of these cases. Hemorrhage from premature separation of the normally implanted placenta or placenta praevia was the indication in 12.5 per cent, with fetal or neonatal deaths occurring in 33.6 per cent. Toxemia (in most instances due to chronic renal impairment) was the indication in 12.3 per cent; the infants were stillborn or died in the neonatal period in 22.7 per cent of this group. The remaining 15.1 per cent of the sections were performed because of cardiac insufficiency or other local or systemic conditions; 10 per cent of these infants were stillborn or died in the neonatal period.

Thus, although the indication was hemorrhage or toxemia in only 25 per cent of the total cesarean sections, in 76 per cent of the sections in which the fetus or infant succumbed this was the indication present. When cesarean section is performed in the absence of maternal complications which may involve the fetus, the mortality rate is low.

Delivery by Version and Extraction.—A total of 162 infants and fetuses were delivered by version and extraction; 20.3 per cent were stillborn and 14.1 per cent died in the neonatal period. Forty-three per cent were at term, 53.5 per cent were premature but viable and 3.5 per cent were previable.

The principal indication for version and extraction which was followed by death of the fetus or infant was hemorrhage associated with placenta praevia or premature placental separation. This was present twenty-eight times, or in approximately half of the cases. Malposition (ten) or long labor (two) occurred in about one fifth of the cases, while prolapsed cord (four), failed forceps (four), hydramnios (three), toxemia (two), second twin (one) and unstated (two) made up the remainder. Toxemia was present in eight cases in addition to the two in which it is given as the indication for version (malposition two, placenta praevia one, placental separation two, failed forceps one, prolapsed cord two).

In seven cases the Braxton Hicks was the type of version performed. In fifteen (26 per cent) a bag induction preceded the version.

Thirty-seven of the total fifty-six dead infants and fetuses were examined at autopsy. The cause of death was anoxemia in 50 per cent, malformations in 19 per cent, intracranial hemorrhage in 13.5 per cent, pneumonia in 2.7 per cent and undetermined in 16 per cent.

Version and extraction carries the highest fetal and infant mortality of any operative procedure. From an analysis of the cases, however, it becomes evident that the high rate is due to the type of case in which this procedure is instituted rather than to the delivery itself. Death in the five infants showing evidence of intracranial injury may probably be attributed to the type of delivery, but the majority of the 50 per cent of deaths from anoxemia were due to maternal hemorrhage or interference with circulation through the cord. The 19 per cent due to major malformations cannot be attributed to the type of delivery.

Delivery by Craniotomy.—Among the fifty-eight infants delivered by craniotomy, thirty-four died before the onset of labor and twenty-four during labor. Twenty of the thirty-four dying before the onset of labor were macerated. There are no outstanding causes of death as shown by autopsy or maternal complications. In about one fourth there were no known maternal complications or demonstrable abnormalities in the infants or fetuses. Nine were associated with maternal toxemia, eight with placenta praevia or premature placental separation, eight were malformed infants (none of whom were born of mothers with complications), eight were associated with cord knots, prolapse, entanglements and the like. In eleven there was a history of long labor or difficult delivery, and two of these infants showed evidence of intra-uterine pneumonia. There were also no great differences in causes of antepartum and intrapartum deaths except in the number of deaths occurring without maternal complications (excluding the malformations). Of these there were eleven cases in the antepartum period and only two in the intrapartum period.

MATERNAL COMPLICATIONS

Maternal Complications in Relation to Pathologic Conditions in the Infant and Fetus.—In 44.6 per cent (354) of the 773 fatalities in this series maternal complications including premature placental separation, placenta praevia, toxemia, cord entanglements or prolapse, medical complications (heart disease, diabetes, pyelitis and the like) or syphilis were present. In only 31.6 per cent, however, could the complication be considered as the probable cause of death, for in the other 13 per cent definite pathologic lesions such as intracranial hemorrhage, malformations and infections were present. In those cases in which the only pathologic lesions demonstrable were petechial hemorrhages, death was believed probably due to the maternal complications and they are included in the 32 per cent so designated.

Hemorrhage from premature placental separation or placenta praevia was the most common complication and was found in 117 cases (33 per cent). In almost half (43 per cent) of these infants and fetuses there were no pathologic lesions. In over one third (38 per cent) petechial hemorrhages were present, and in the remaining 17 per cent a variety of causes of death were found.

Among the infants born of toxemic mothers (114) only 18 per cent showed definite evidence of anoxemia (petechial hemorrhages) and 21 per cent showed other pathologic lesions, while in 61 per cent no evidence of

a cause of death could be found. It is very probable that toxemia was the main inciting factor in the majority of the first and last groups.

In an additional twenty-eight cases both toxemia and premature placental separation were present. Seventeen of these infants and fetuses had petechial hemorrhages in the thoracic viscera; in eleven there were no abnormalities.

Cord abnormalities producing interference with circulation (fifty-four) were less than half as common as either toxemia or hemorrhage. As would be expected, the most common abnormalities in these infants were those indicative of anoxemia (42 per cent). In 13 per cent there was intracranial hemorrhage or a major mal-

Absence of Maternal Complications.—There were no maternal complications associated with the death of 419 (55 per cent) fetuses and infants. Of these, 175 (22.6 per cent of all deaths) showed pathologic changes at autopsy or a fairly definite cause of death was assigned clinically. In 244 (30.2 per cent) there was neither a maternal complication nor a demonstrable cause of death. In the different age groups, absence of maternal complications and pathologic lesions occurred with the following frequency: (a) deaths in the neonatal period; term, 8.2 per cent, premature, 29.1 per cent, previable, 63 per cent; (b) stillborn; term, 20.6 per cent, premature, 20.6 per cent, previable 47.8 per cent.

TABLE 2.—Causes of Death Associated with Types of Delivery

	Natural Cephalic Delivery			Low Forceps Delivery			Mid and High Forceps Delivery			Breech Delivery			Cesarean Section			Version and Extraction		
	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent
Hemorrhage.....	18	4	6.4	11	3	24.5	16	13	69.1	10	8	15.0	8	2	10.8	7	1	12.5
Intracranial.....	17	3	.....	10	.....	.....	14	11	.....	8	7	.....	8	.....	.....	7	.....	.....
Intracranial and pneumonia.....	.....	1	.....	1	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Visceral.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Anoxemia.....	18	16	9.8	4	11	31.6	.....	5	11.9	7	18	20.8	12	17	31.2	12	23	41.6
Maternal complications.....	7	14	.....	2	9	.....	.....	3	.....	6	24	.....	12	17	.....	1	11	.....
Abruptio or placenta praevia.....	2	4	.....	1	.....	.....	.....	3	.....	3	5	.....	7	17	.....	.....	.....	.....
Abruptio and toxemia.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	4	6	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N.....	11	2	.....	2	.....	.....	.....	2	.....	1	4	.....	.....	.....	.....	.....	10	.....
Malformations.....	50	11	17.7	8	4	21.1	2	1	7.1	.....	11	9.2	4	.....	4.3	1	6	12.5
Infections.....	6	3	2.6	.....	.....	0.0	.....	.....	0.0	3	.....	1.5	3	.....	3.2	2	.....	5.4
Pneumonia.....	3	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	3	.....	.....	3	.....	.....
Syphilis.....	1	2	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Septicemia.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Diphtheria.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Idiopathic conditions.....	.....	7	2.3	.....	.....	0.0	.....	.....	0.0	.....	.....	0.0	10	.....	10.8	.....	.....	0.0
Edema of the brain.....	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	.....	.....	.....	.....
No pathologic changes.....	82	129	61.2	12	1	22.8	12	3	11.9	40	23	52.5	25	12	39.7	10	4	15.0
Maternal complications.....	19	69	.....	2	.....	.....	.....	.....	.....	7	15	.....	25	12	.....	9	4	.....
Abruptio or placenta praevia.....	4	19	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Abruptio and toxemia.....	1	5	.....	1	.....	.....	.....	.....	.....	2	3	.....	12	6	.....	1	1	.....
.....	6	32	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	6	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Syphilis.....	2	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
No maternal complications.....	63	60	.....	10	1	.....	.....	3	.....	33	8	.....	.....	.....	.....	1	.....	.....
Total.....	174	170	100.0	35	12	100.0	20	22	100.0	60	60	100.0	62	31	100.0	23	33	100.0

formation, and in 44 per cent no pathologic changes were present. In one third of the last group maternal hemorrhage or toxemia also was present.

There were only thirteen women in whom a history of a syphilitic infection was obtained. Only four of nine infants or fetuses examined at autopsy showed evidence of syphilis; in the three not examined there was no clinical evidence of syphilis. The total incidence of maternal syphilis in this series is only 1.3 per cent. It is probable that not more than half this number actually died of syphilis.

Maternal Complications in Relation to Time of Death.—The lowest incidence of maternal complications is found in term infants who die in the neonatal period (9 per cent). In stillborn term fetuses the incidence of complications in the mother is three times as great (28 per cent). They are most common in association with the birth of dead premature or previable fetuses (37 per cent), while they occur in 26 per cent of premature or previable infants who died in the neonatal period.

CAUSE OF DEATH AS DEMONSTRATED BY AUTOPSY

Incidence of Pathologic Lesions in Relation to Time of Death (table 3).—Sixty-eight per cent (526) of all dead infants and fetuses born in the Chicago Lying-in Hospital during the period under investigation were examined at autopsy; this comprised 66 per cent of the live born infants and 70 per cent of the stillborn fetuses. The number of live born (48 per cent) and the number of stillborn (52 per cent) were almost equal, and the number falling into the previable, premature and term groups were remarkably evenly divided between those stillborn and those which were live born. Of the entire group 12.2 per cent were previable, 14.1 per cent were premature and 43.7 per cent were at term.

It was impossible to demonstrate pathologic changes in 52 per cent of the stillborn fetuses and in 32 per cent of the live born infants. However, in only eleven term infants and fetuses was there absence of pathologic lesions. Only 5 per cent of live born infants in whom

no pathologic lesions were present were at term, so that in the remaining 27 per cent prematurity was the probable cause of death.

In ninety-seven of the 148 stillborn fetuses in whom no pathologic lesions were demonstrable, maceration had advanced to a degree sufficient to have masked any hemorrhage which might have been present; there were only 18 per cent of the fetuses which showed neither maceration nor pathologic changes.

In the combined series of stillbirths and neonatal deaths anoxemia (18.5 per cent) and malformations (18.1 per cent) are the most important lethal factors, and an almost equal number of deaths fall in each group. However, the distribution is decidedly different in the two groups, for there are twice as many malformations as anoxemias in the live born group and twice as many anoxemias as malformations among those who were stillborn. Thus malformations are the most common cause of death in live born infants (24.5 per cent), while anoxemia is the most common cause in stillborn fetuses (23.8 per cent). Anoxemia accounts for 12.2 per cent of the deaths in live born infants, malformations for 12.4 per cent of the deaths in stillborn fetuses.

definitely known, and whether or not it is a lethal factor cannot be stated positively. It was found most frequently following birth by cesarean section; the majority of the infants lived from eight to twenty-four hours and showed clinical evidence of increased intracranial pressure.

Erythroblastosis was present in four live born infants and in six stillborn fetuses, an incidence of 1.3 per cent of the total deaths. These cases were included with those presenting malformations because the conditions seem most probably due to a congenital malformation of blood-forming tissue.

Only one case of hemorrhagic disease of the newborn was present in the entire series. This case was included under visceral hemorrhage.

Pathologic Changes in Relation to Type of Delivery.—In autopsies performed on viable infants and fetuses malformations account for 5 per cent of the deaths of those delivered by cesarean section, 7 per cent of those by high or mid forceps, 9.2 per cent of those by version and extraction, 9.3 per cent of those by breech delivery, 14 per cent of those by low forceps and 20 per cent by natural cephalic delivery. It is interesting to note

TABLE 3.—Causes of Death as Demonstrated at Autopsy of 526 Fetuses and Infants

	Hemorrhage		Anoxemia		Malformations		Infections		Miscellaneous		Undetermined		Total	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Term.....	52	22.6	44	19.0	62	26.8	10	4.3	2	0.0	61	26.4	231	100.0
Live birth.....	32	31.1	9	8.7	43	41.7	6	5.8	2	2.0	11	10.7	103	100.0
Stillbirth.....	20	15.6	35	27.3	19	14.8	4	3.1	..	..	50	39.2	128	100.0
Premature.....	20	12.4	51	21.9	33	14.2	5	2.1	7	3.0	108	46.4	233	100.0
Live birth.....	23	20.7	20	18.0	17	15.3	4	3.6	7	6.3	40	36.1	111	100.0
Stillbirth.....	6	4.9	31	25.4	16	13.1	1	0.9	..	..	68	55.7	122	100.0
Previsible.....	2	3.2	2	3.2	..	..	1	1.7	..	..	57	91.9	62	100.0
Live birth.....	2	6.5	1	3.2	..	..	1	3.2	..	..	27	87.1	31	100.0
Stillbirth.....	..	..	1	3.2	..	..	..	..	..	..	30	96.8	31	100.0
Total.....	83	15.8	97	18.5	95	18.1	16	2.9	9	1.7	226	43.0	526	100.0

The third most frequent cause in the combined series is gross hemorrhage, usually intracranial and usually traumatic. It is present in 15.8 per cent of the entire group but is more than twice as frequent in live born infants as in stillborn fetuses. It accounts for 23.4 per cent of the deaths in live born infants (second in importance) and for 9.3 per cent of the stillbirths (third in importance).

Infections are much less frequent than the three preceding factors and caused death in only 3 per cent of the cases. They are twice as common in live born infants as in stillborn fetuses. The types of infections were pneumonia nine (those having both intracranial hemorrhage and pneumonia were placed with the former group), syphilis four, septicemia two and diphtheria one.

The incidence of syphilis seems remarkably low, but in addition to the four cases of proved syphilis there were only five other infants examined at autopsy who had been born of mothers with a positive Wassermann reaction, and syphilis could not be demonstrated in those infants. The total of nine cases, four proved and five in which it may possibly have been a contributing factor, represents only 1.3 per cent of all the infants and fetuses examined at autopsy.

Edema of the brain without other pathologic changes was present in 1.7 per cent of all autopsies but was found only in live born infants. Its significance is not

that this is almost the reverse order of importance of intracranial hemorrhage as a cause of death.

Anoxemia accounts for 8.1 per cent of the cases in which autopsies were performed on viable infants and fetuses delivered naturally in a cephalic position, 9.3 per cent by high or mid forceps, 15.7 per cent by low forceps, 17.6 per cent by breech, 23.4 per cent by cesarean section and 33.4 per cent by version and extraction.

Intracranial hemorrhage accounts for 6.1 per cent of the deaths among autopsies performed on viable infants and fetuses delivered naturally in a cephalic position, 9.2 per cent by version and extraction, 9.6 per cent by cesarean section, 17.5 per cent by low forceps, 21.1 per cent by breech deliveries and 46.8 per cent by high or mid forceps.

Of the three most important causes of death, anoxemia shows the highest incidence in version and extraction and in cesarean section; malformations in natural cephalic deliveries and in those aided by low forceps; intracranial hemorrhage in high forceps and in breech deliveries.

Pathologic Lesions in Relation to Degree of Maturity.—Anoxemia occurs as a cause of death with fairly equal frequency in the total number of autopsies on infants and fetuses at term (19 per cent) and those in the premature period (21.9 per cent). Malformations are almost twice as frequent a cause of death in those at term (26.8 per cent) as in those who succumb in the

premature period (14.2 per cent). Contrary to the commonly stated fact that death in the premature infant is much more likely to be due to intracranial hemorrhage than it is in an infant at term, the opposite is shown to be true by this series of autopsies. Only 12.4 per cent of all the premature infants who were examined at autopsy showed intracranial hemorrhage, while it was present in 22.6 per cent of the term infants who were examined at autopsy. Of 100 premature infants and fetuses and 100 at term, intracranial hemorrhage is found at autopsy only half as frequently in the premature as in the ones at term. However, since neonatal deaths and stillbirths are approximately eighteen times as common in premature infants as in those at term, it may be said that any premature infant alive at the onset of labor and about to be delivered has twenty-one times as many chances of dying from anoxemia, ten times as many chances of dying of a malformation and eleven times as many chances of dying from intracranial hemorrhage as does an infant at term.

No pathologic lesions were demonstrable in 46.4 per cent of the premature fetuses and infants and in 26.4 per cent of the fetuses and infants at term.

Death in an infant or fetus at term is more commonly due to malformation than any other demonstrable cause; death in the premature period is more commonly due to anoxemia than to any other demonstrable cause.

SUMMARY

Although only 6.3 per cent of all infants and fetuses delivered at the Chicago Lying-in Hospital from May 1931 to Jan. 1, 1938, had not reached term before delivery, this group accounted for 59 per cent of the total mortality. In only 57 per cent of all dead infants and fetuses examined at autopsy could a definite pathologic state be demonstrated. This varied from 90 per cent for live born term infants to 44 per cent for premature stillborn infants. In live born infants who died in the neonatal period the most important causes of death were malformations (24.5 per cent), intracranial hemorrhage (23.4 per cent) and anoxemia (12.2 per cent), while in stillborn fetuses the most important causes were anoxemia (23.8 per cent), malformations (12.4 per cent) and intracranial hemorrhage (9.3 per cent). Malformations accounted for a remarkably high proportion of deaths in full term infants who died in the neonatal period (41.7 per cent of those examined at autopsy).

Complications, exclusive of those due to the mechanism of labor, occurred during pregnancy or labor in association with 45.7 per cent of all fetal or neonatal deaths. The most important were toxemia and hemorrhage from premature separation of the placenta or placenta praevia. These were found in association with 33 per cent of the total deaths. Abnormalities of the cord (7.0 per cent), syphilis (1.6 per cent) and other pathologic conditions (3.4 per cent) made up the remaining 12 per cent.

The gross mortality rate does not give an accurate estimate of the role which various types of delivery may play in contributing to fetal and neonatal deaths. A disproportionately large number of premature infants and fetuses delivered by a certain method means a disproportionately high death rate in that group. Eliminating those infants and fetuses that died before the onset of labor, that had not reached the period of viability or in which death was the result of a major

malformation gives mortality rates corrected in such a way that some estimate may be made of the effect of various types of delivery. The total mortality (both stillbirths and neonatal deaths) corrected on this basis is 2.5 per cent. If these figures are adjusted so that they represent the total mortality had there been 5 per cent premature infants delivered by each method (the incidence of viable premature infants among all live born infants was 5 per cent) the figures are natural cephalic delivery 1.1 per cent, low forceps 1.3 per cent, mid and high forceps 5 per cent, breech presentation 7.1 per cent, cesarean section 4.1 per cent, version and extraction 13.4 per cent. The total uncorrected mortality is 4.4 per cent.

STUDIES ON THE CIRCULATION IN PREGNANCY

X. SUMMARY OF STUDIES OF THE PHYSIOLOGY OF THE CIRCULATION OF NORMAL PREGNANT WOMEN: A NEW CONCEPT OF THE NATURE OF THE CIRCULATORY BURDEN OF PREGNANCY AND ITS APPLICATION TO THE MANAGEMENT OF CLINICAL PROBLEMS OF PREGNANCY

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Studies were conducted for several years (1932-1937) at the cardiac research laboratory of the Boston Lying-in Hospital on the physiology of the circulation of pregnant women.¹ The purposes of these studies were, first, to learn the dynamics of the circulation of the normal pregnant woman, second, to learn what the nature of the "increased burden" on the pregnant woman with heart disease is, and, finally, to develop, if possible, concepts which might be of clinical use in the management of normal pregnant women and pregnant women with heart disease. A summary of the results of these studies, plus pertinent studies from the literature, will be presented here.

CLINICAL AND LABORATORY EXAMINATIONS

Before proceeding to the physiologic results of this study, it seems useful to present facts bearing on the simpler clinical aspects of the subject gained from the clinical examination of the cardiorespiratory system. This study included single examinations of 3,000 normal pregnant women by us and serial examinations, i. e. monthly examinations of the same patient, of sixty-six more normal pregnant women and of 300 pregnant women with "organic" heart disease. These facts gain importance because knowledge of the normal symptoms of pregnancy may prevent erroneous diagnoses of heart

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1. Thomson, K. J.; Hersheimer, A.; Gibson, J. G., 2d, and Evans, W. A., Jr.: Studies on the Circulation in Pregnancy: III. Blood Volume Changes in Normal Pregnancy, *Am. J. Obst. & Gynec.* 36:43 (July) 1938. Thomson, K. J., and Cohen, M. E.: Studies on the Circulation in Pregnancy: VII. Circulatory Studies of Pregnant Women with Cardiac Disease, to be published. Thomson, K. J.; Gorman, W. A.; Reid, D., and Gibson, J. G., 2d: Studies on the Circulation in Pregnancy: VIII. Blood Volume Observations in Pregnant Women with Cardiac Disease, to be published. Reid, D.; Thomson, K. J.; Gorman, W. A., and Gibson, J. G., 2d: Studies on the Circulation in Pregnancy: IX. Blood Volume Observations in Pregnancy Complicated by "Toxemia," to be published. Cohen and Thomson,² Thomson, Cohen and Hamilton,³ Cohen and Thomson,⁴ Thomson, Reid and Cohen,⁵ Thomson and Cohen.¹⁰

disease in the pregnant woman. They are summarized in the accompanying table. It should be emphasized that normal pregnant women commonly complain of dyspnea. Many of them are orthopneic, that is they breathe more comfortably when they are propped up in bed. Many of them are awakened at night by attacks of palpitations and choking. Complaint of palpitations is common, as is complaint of swelling of the legs and hands. It can be seen thus that symptoms ordinarily attributed to heart disease and heart failure occur normally in the pregnant woman. Obviously such symptoms are also present in pregnant women with heart disease, but by themselves they do not indicate heart disease or congestive failure.

Physical examination during the latter part of pregnancy shows the skin flushed, moderate collapsing pulse and in many instances capillary pulsation over the fingers and the veins dilated over the abdomen and chest. Location of the apex of the heart is difficult because of the large breasts; the pulse is usually rapid and auscultation reveals usually a loud first sound at the mitral area, pulmonic and apical systolic murmurs and the pulmonic second sound commonly louder than the aortic second sound. Pulmonic systolic murmur is demonstrable in late pregnancy by careful physical examination of the heart in 100 per cent of cases and apical systolic murmur in approximately 50 per cent. The signs are those of hyperactive or hyperkinetic heart.² Though superficial examination might lead to an erroneous diagnosis of mitral stenosis, more careful examination, with particular note of the absence of diastolic murmur, will lead to the correct conclusion. "Functional" diastolic murmurs are not heard and do not occur because of pregnancy. Swelling of the legs is common. Transient rales almost never occur at the bases of the lungs of the normal pregnant woman. Constant rales at the bases, which never occur in normal pregnant women, are pathologic, and in a pregnant woman with heart disease constitute the most valuable sign of failure. Further discussion of the diagnosis of heart failure in pregnancy is presented elsewhere.³

Laboratory studies also show changes during normal pregnancy. Seven foot roentgenograms of the heart sometimes suggest slight enlargement, i. e. the transverse diameter of the heart shadow may exceed by 1 or 2 cm. half the transverse diameter of the chest. There is no crucial evidence to determine whether this is due to displacement or enlargement (hypertrophy or dilatation) of the heart or both. The lungs in roentgenograms show increased markings that could be mistaken for mild congestive failure by one not familiar with x-ray studies of pregnant women. These pulmonary x-ray changes are probably related to an increase in the vascular bed of the lungs and to perivascular infiltration.⁴ The electrocardiogram is not remarkable except that a tendency toward left axis deviation as pregnancy progresses has been shown, with a shift back toward normal in the final weeks.⁵ The Q wave in lead 3 is deep in 5 per cent of cases,⁶ and in

the chest lead,⁷ with the exploring electrode placed in the fourth interspace 5 cm. to the left of the midsternal line, the T wave may become upright⁸ (old technic) for 8 per cent of normal pregnant women and become inverted (old technic) again after delivery. Changes therefore which are sometimes interpreted as being related to coronary artery disease can be seen to occur during normal pregnancy. The white blood cell count⁹ in pregnancy may be elevated, that is to from 12,000 to 15,000, and the sedimentation rate of the red blood cells is much increased.¹⁰ It can be seen that use of the white cell count and sedimentation rate as indicators of rheumatic activity in pregnancy without proper corrections might lead to error. Clearcut active rheumatic fever in pregnancy, as a matter of fact, was not seen in this study (300 cases of rheumatic heart disease) and is extremely rare. It should be pointed out that "heart disease" in pregnancy means

Common Clinical and Laboratory Observations in Normal Pregnancy

I. Symptoms

1. Dyspnea
2. Orthopnea
3. "Pseudoparoxysmal nocturnal dyspnea"
4. Palpitations
5. Swelling of legs

II. Signs

1. Percussion for cardiac size unreliable
2. Apex beat obscure
3. Loud mitral first sound
4. Apical systolic murmur
5. Loud third heart sound
6. Pulmonic second sound greater than aortic second sound
7. Pulmonic systolic murmur (100 per cent)
8. Tachycardia
9. Extrasystoles
10. Prominent veins
11. Quick pulse (like Corrigan's pulse) and capillary pulse
12. Edema of lower extremities

III. Laboratory Data

1. Roentgenogram
 - A. Slight enlargement of cardiac shadow
 - B. Picture suggests pulmonary congestion
2. Electrocardiogram
 - A. Deep Q-3 (5 per cent)
 - B. Upright T-4 (old terminology; 8 per cent)
 - C. Extrasystoles
3. Sedimentation rate increased
4. White blood cell count increased
5. Red blood cell count
Hemoglobin concentration
Hematocrit reading } decreased

rheumatic heart disease, for practical purposes, as 91.9 per cent of 850 cardiac patients in this clinic had rheumatic heart disease.

In summary, then, it may be said that in the clinical examination of the pregnant woman, including the clinical laboratory tests, there are signs and symptoms which, unless properly interpreted, might lead to erroneous diagnoses of heart disease, heart failure or rheumatic activity (as shown in the table).

PHYSIOLOGIC STUDIES

The basal pulse rate is accelerated early in pregnancy and averaged, in a group of fifty-one normal pregnant women, 81 beats a minute throughout pregnancy, with

2. Harrison, T. R.: Failure of the Circulation, Baltimore, Williams & Wilkins Company, 1935.

3. Cohen, M. E., and Thomson, K. J.: Studies on the Circulation in Pregnancy: VI. Vital Capacity in Pregnant Women with Cardiac Disease and Its Value in Predicting and Diagnosing Early Heart Failure, to be published.

4. Hofbauer, J.: Die Bedeutung der Generationsvorgaenge fuer die Klinik der Tuberkulose, Ztschr. f. Geburtsh. u. Gynaek. 67: 572, 1910.

5. Carr, F. B., and Palmer, R. S.: Observations on Electrocardiography in Heart Disease Associated with Pregnancy and Especial Reference to Axis Deviation, Am. Heart J. 8: 238 (Dec.) 1932.

6. Carr, F. B., Hamilton, B. E., and Palmer, R. S.: The Significance of Large Q in Lead III of the Electrocardiogram During Pregnancy, Am. Heart J. 8: 519 (April) 1933.

7. Thomson, K. J.; Cohen, M. E., and Hamilton, B. E.: Studies on the Circulation in Pregnancy: V. Lead 5 of the Electrocardiogram in Pregnancy, Am. J. M. Sc. 196: 819 (Dec.) 1938.

8. At the time this work was done, the accepted technic (old) of connecting the electrodes for chest leads of electrocardiograms resulted in a tracing in which the T wave was usually inverted. Subsequent to this study the technic was modified so that the T wave appears upright commonly. Chest leads taken with the modified (new) technic would show the reverse of our results, i. e. an upright T wave would be usual and an inverted one unusual.

9. Baer, J. L.: The Leukocytes in Pregnancy, Labor and the Puerperium, Surg., Gynec. & Obst. 23: 567 (Nov.) 1916.

10. Griffin, R. J.: The Sedimentation Rate and Schilling Index in Pregnancy, Am. J. Obst. & Gynec. 28: 532 (Oct.) 1934.

some persons showing a tendency toward gradual increase until term. Post partum the average basal pulse rate dropped to 70 beats a minute.¹¹ The exact time of return of the pulse rate to normal is unknown as yet.

The basal arterial blood pressure remains within normal limits (the systolic pressure less than 140 mm. of mercury and the diastolic less than 90 mm.) during the course of uncomplicated pregnancy. There seems to be a definite tendency for both average systolic and average diastolic pressure to decrease from the fourth to the ninth lunar¹² month and to increase during the tenth. The diastolic pressure shows a greater decrease, so that there is an increase in pulse pressure. This has been found by other observers¹³ and may be associated with the collapsing pulse and the capillary pulse previously described.

The venous pressure in the arms was measured for twenty normal pregnant women (ninety-four obser-

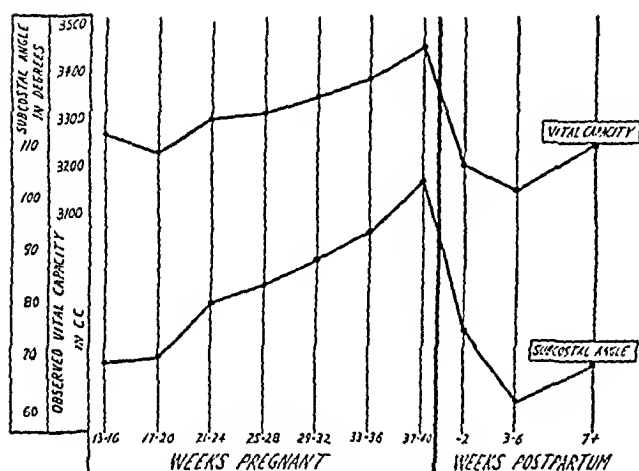


Chart 1.—The relation between the average observed vital capacity and the average curve of values for the subcostal angle in pregnancy. The heavy perpendicular line represents delivery and separates the antepartum and the postpartum period. Note the close correspondence between the two curves, indicating that changes in vital capacity correlate with changes in size and shape of the chest.

vations) and for twenty-seven pregnant women with compensated cardiac disease (144 observations) by the direct method of Moritz and von Tabora¹⁴ and was found to be within normal limits. There was a tendency to diminution during pregnancy and to slight increase post partum, but this was not marked.¹⁵ Elevation of venous pressure measured in the femoral vein in pregnancy has been reported.¹⁶

Studies of the respiratory system show a marked increase in total ventilation,¹⁷ accompanied with slight but not proportionate increase in oxygen consumption.¹⁸

The average vital capacity, studied in thirty-one normal pregnant women, showed a gradual rise¹⁹ during pregnancy, with a drop post partum. It is of interest that this correlates precisely with the increase in the subcostal angle (chart 1), indicating that the explanation of this slight increase in vital capacity is increase in the size of the chest. Change in size of the chest has been shown further by x-ray studies on measurements of the thoracic cage in this clinic¹⁹ and by studies in the literature.²⁰ It is commonly believed that the dyspnea of pregnancy is due to the decrease in vital capacity; however, since the vital capacity does not decrease but actually increases, the cause of the dyspnea must be sought elsewhere. The increase in total ventilation without a proportionate increase in the vital capacity is thought to be an adequate explanation for this phenomenon, as it is known that an increase in total ventilation, a decrease in vital capacity or an increase of their normal ratio may cause dyspnea.²

It is of note that patients with heart disease showed the same general trend in vital capacity as normal patients, that is, a slight rise during pregnancy and a fall post partum, although the average values were slightly below those of the normal pregnant woman. No patients without heart failure showed a decrease in vital capacity of 8 per cent or more. Hence, a significant drop (15 per cent) in vital capacity in a pregnant woman with cardiac disease indicated impending heart failure and was a practical early sign of failure, preceding the appearance of rales at the bases of the lungs. This point may be illustrated here by one typical case (chart 2). In these patients, as well as in those with cardiac disease whose vital capacity was studied for the first time during heart failure, a return of compensation was accompanied with a significant rise in vital capacity.³

Studies were made on the velocity of blood flow by the cyanide method of Robb and Weiss,²¹ which utilizes the pathway between a vein and the carotid sinus. One hundred and forty-three observations of the arm-to-carotid circulation time²¹ were made on thirty-six normal pregnant women, and the results fell almost without exception in the range for normal nonpregnant women. However, the average velocity of blood flow was normal early in pregnancy, increased at about the seventeenth week of gestation and decreased at the thirty-sixth week, just prior to term. The velocity of blood flow increased immediately post partum and returned to the normal level by the seventh week post partum. This general trend was present in both the peripheral and the pulmonary circulation (112 observations), being more marked in the peripheral circulation and slight in the pulmonary.

Further evidence for speeding of the circulation during pregnancy has been given by simultaneous studies of cardiac output and oxygen consumption.²² The cardiac output rose out of all proportion to the oxygen

11. Cohen, M. E., and Thomson, K. J.: Studies on the Circulation in Pregnancy: I. The Velocity of Blood Flow and Related Aspects of the Circulation in Normal Pregnant Women, *J. Clin. Investigation* 15: 607 (Nov.) 1936.

12. In this discussion the term month always refers to lunar month.

13. Henry, J. S.: Effect of Pregnancy upon Blood Pressure, *J. Obst. & Gynec. Brit. Emp.* 43: 908 (Oct.) 1936.

14. Moritz, F., and von Tabora, D.: Ueber eine Methode, beim Menschen den Druck in oberflächlichen Venen exakt zu bestimmen, *Deutsches Arch. f. klin. Med.* 98: 475, 1910.

15. Thomson, K. J.; Reid, D., and Cohen, M. E.: Studies on the Circulation in Pregnancy: IV. Venous Pressure Observations in Normal Pregnant Women, Pregnant Women with Compensated Cardiac Disease, Decompensated Cardiac Disease and the "Toxemias" of Pregnancy, to be published.

16. Burwell, C. S.: A Comparison of the Pressures in Arm Veins and Femoral Veins with Special Reference to Changes During Pregnancy, *Tr. A. Am. Physicians* 52: 289, 1937.

17. Anthony, A. J., and Hansen, Rolf: Lungenventilation und Atmung in der Schwangerschaft, *Ztschr. f. Geburtsh. u. Gynäk.* 105: 183 (May) 1935.

18. Root, H. F., and Root, H. K.: The Basal Metabolism During Pregnancy and the Puerperium, *Arch. Int. Med.* 32: 411 (Sept.) 1923.

19. Thomson, K. J., and Cohen, M. E.: Studies on the Circulation in Pregnancy: II. Vital Capacity Observations in Normal Pregnant Women, *Surg., Gynec., & Obst.* 66: 591 (March) 1938.

20. Zhurakovski, M. K.: The Changes in Form of the Pulmonic Cell (Thoracic Cage), the Power of Inspiration and Expiration, and the Vital Capacity of the Lungs in Pregnant and Lying-in Women, *St. Petersburg. B. M. Wolf*, 1893. Mackenzie, James: *Heart Disease and Pregnancy*, New York, Oxford University Press, 1921. Klawns, E., and Palagay, J.: Vergleichende Untersuchungen über Lage und Ausdehnung von Herz und Lunge in der Schwangerschaft und im Wochenbett, *Arch. f. Gynäk.* 131: 347, 1927.

21. Robb, G. P., and Weiss, Soma: A Method for the Measurement of the Velocity of the Pulmonary and Peripheral Venous Blood Flow in Man, *Am. Heart J.* 8: 650 (June) 1933.

22. Burwell, C. S., and Strayhorn, W. D.: Observations on the Circulation During and After Pregnancy, *J. Clin. Investigation* 12: 977 (Sept.) 1933.

consumption, which of course implies speeding of the circulation, as does demonstration of a decreased arteriovenous oxygen difference during pregnancy. The slowing of the circulation in the latter part of pregnancy, as demonstrated in our studies, is further corroborated by the waning of the disproportion between cardiac output and oxygen consumption during the last months of pregnancy and as the cardiac output decreases.

The cardiac output during pregnancy, according to other studies,²³ shows a gradual increase during early pregnancy, with the maximum cardiac output appearing from the sixth through the ninth lunar month. A definite decrease in cardiac output, which may even bring the value back to its normal level, occurs during the tenth lunar month. In most cases, however, the normal level is attained within several weeks after delivery.

Not only does the cardiac output during rest show an increase during pregnancy, but in addition the increase in cardiac output with exercise is disproportionately greater in pregnant women than in normal nonpregnant ones.²¹

It will be seen then that the circulation of the blood speeds up from week to week of pregnancy and slows up as the puerperium approaches. It can be seen further that corresponding with this the heart pumps more blood a minute during the same period when the blood is flowing faster. Also at the time that the circulation slows, that is, during the last four to six weeks of pregnancy, the heart pumps less blood a minute.

Studies were made of the total amount of blood in the body and its composition. Studies of total blood volume during pregnancy have been at variance but usually reported an increase.²⁵ One hundred observations on blood volume in pregnancy, made at this clinic²⁶ by the colorimetric method of Keith, Rowntree and Geraghty,²⁷ showed a higher value than that of the nonpregnant state, which merely corroborated the data of most previous observers. However, it was felt that the technical errors incident to this method made it valueless for the study of the exact changes from month to month for pregnant women and that such a study must await the development of a more precise method for blood volume determination. The spectrophotometric method of Gibson and Evans²⁸ provided the needed precision, and by this method it was possible to discover for the first time, with fourteen women on whom fifty-six determinations (forty ante and sixteen post partum) were made at intervals during pregnancy, the exact trend of the change in blood volume. It was found that there was a progressive increase in plasma volume from early pregnancy through the ninth lunar month, when a maximum was reached, and then a decrease in the tenth lunar month. This decrease continued post partum, so that by the end of the second

week the volume had reached the normal level for nonpregnant women. At the period of maximum increase the average increase is 65 per cent above the average value for normal nonpregnant women. The total cell volume, measured by the hematocrit, also changed during pregnancy, following the trend of the plasma volume. The total blood volume increased to a maximum of 45 per cent over the value for normal nonpregnant women at the height of increase. The cause of increase in plasma volume is not known, but since the outstanding conditions in which blood volume is profoundly disturbed, such as exophthalmic goiter, myxedema and Addison's disease,²⁹ are due to endocrine disturbances, it is thought that the endocrine disturbance in pregnancy offers the most reasonable point for study. Moreover, there is a striking but not exact resemblance of the trend of plasma volume to that of excretion of gonadotropic substance in normal pregnancy.³⁰ The demonstration of the sodium and water

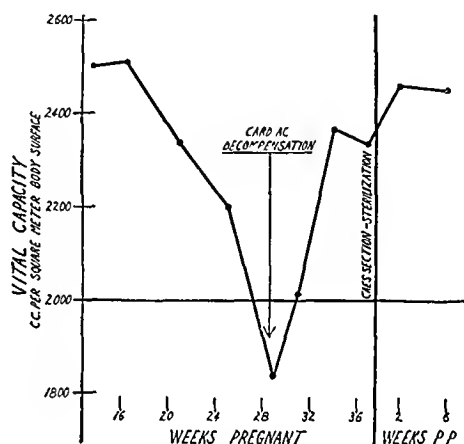


Chart 2—The vital capacity before, during and after heart failure in a pregnant woman suffering from severe rheumatic heart disease. Note the steady decrease in vital capacity which preceded the appearance of clinical cardiac decompensation, i.e., weakness, cough and rales at the bases of the lungs. Compensation was restored with bed rest, restriction of fluids and administration of digitalis; this was accompanied with a rise in the vital capacity. The decrease in vital capacity is a warning of impending clinical heart failure.

retaining effect of the estrogenic and androgenic substances³¹ lends further support to the speculation that the increase in blood volume in pregnancy may be endocrine determined. The increased blood volume may well cause the increased cardiac output. It has been shown experimentally that increased blood volume leads to increased cardiac output;³² how far the results of studies in which blood volume is raised acutely apply to pregnancy, in which blood volume is increased over a long period, is not known.

Studies of the red blood cell count and hemoglobin and hematocrit readings showed changes which correlated inversely with the change in plasma volume, that is, as the plasma volume increased, the red blood cell count, hematocrit reading and hemoglobin per unit volume of blood decreased. These studies showed return toward normal before delivery and not post

23 Gammeltoft, S. A.: The Heart in Pregnancy, *Surg., Gynec. & Obst.* 46: 382 (March) 1928. Burwell and Strayhorn.

24 Schmidt, R. H.: Ueber die Herzarbeit in der Frühschwangerschaft in der Ruhe und nach Arbeitsversuchen, *Monatschr. f. Geburtsh. u. Gynäk.* 90: 83 (Jan.) 1932.

25 (a) Rowntree, L. G.; Brown, G. E., and Roth, G. M.: The Volume of the Blood in Health and Disease, Philadelphia, W. B. Saunders Company, 1929. (b) Diekmann, W. J., and Wegner, C. R.: The Blood in Normal Pregnancy. I. Blood and Plasma Volumes, *Arch. Int. Med.* 53: 71 (Jan.) 1934.

26 Cohen, M. E.: Unpublished data.
27 Keith, N. M.; Rowntree, L. G., and Geraghty, J. T.: A Method for the Determination of Plasma and Blood Volume, *Arch. Int. Med.* 16: 547 (Oct.) 1915.

28 Gibson, J. G., 2d, and Evans, W. A., Jr.: Clinical Studies of the Blood Volume. I. Clinical Application of a Method Employing the Azo Dye "Evans Blue" and the Spectrophotometer, *J. Clin. Investigation* 16: 301 (May) 1937.

29 Thompson, W. O.: Studies in Blood Volume: I. The Blood Volume in Myxedema, with a Comparison of Plasma Volume Changes in Myxedema and Cardiac Edema, *J. Clin. Investigation* 2: 477 (Aug.) 1926. Rowntree, Brown and Roth.

30 Browne, J. S. L.; Henry, J. S., and Vennery, E. H.: The Urinary Excretion of Prolan, Oestrin and Pregnenolone in Normal Pregnancy and in Early and Late Pregnancy Toxemia, to be published.

31 Thorn, G. W., and Harrop, C. A.: The "Sodium Retaining Effect" of the Sex Hormones, *Science* 86: 40 (July 9) 1937.

32 Altschule, M. D., and Gilligan, D. R.: The Effects on the Cardiovascular System of Fluids Administered Intravenously in Man: II. The Dynamics of the Circulation, to be published.

partum and supplemented the original observations of Kühnel.³³ The mean corpuscular volume of the red cells was relatively high during pregnancy, reaching an average maximum of 90.9 cubic microns (twelve cases). It can be seen therefore that the increase in plasma volume accounts in part at least, as has been stated before,³⁴ for the so-called physiologic anemia of pregnancy.

No severe anemia developed in the patients studied throughout pregnancy, and one might add the general clinical statement that in the absence of infection, such as pyelitis, or of inadequate diet, no severe anemia was noted at this hospital in patients known to have normal blood before the onset of pregnancy. In other words,

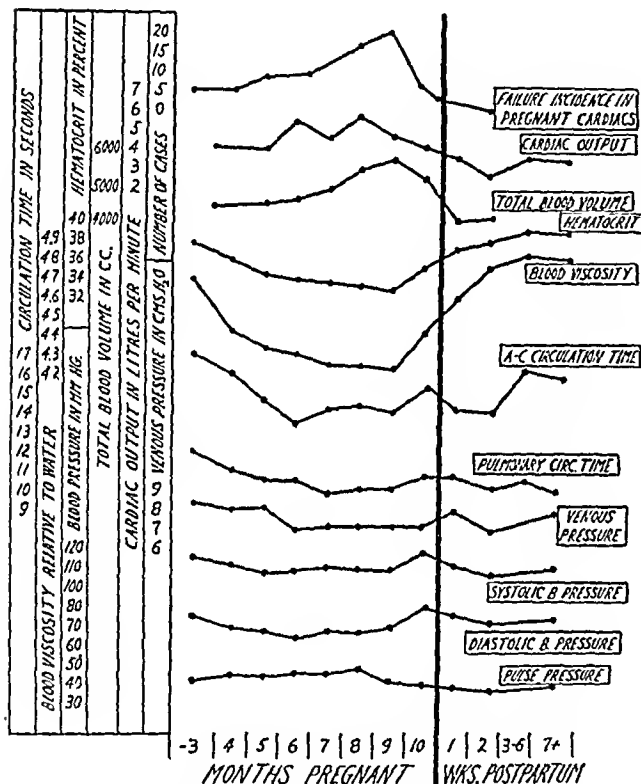


Chart 3.—A summary of the studies of the circulation in pregnancy. The heavy perpendicular line represents delivery and separates the antepartum and the postpartum period. The data on cardiac output are taken from Burwell³⁵ and the others from our work. The total blood volume and cardiac output have similar trends, i. e., increase during the early part of pregnancy and decrease in the last months. The viscosity of the blood and the hematocrit reading, which correlate fairly well with the hemoglobin concentration of the blood, show decrease during early pregnancy and increase during the last months. The curve for circulation time parallels somewhat that of the blood viscosity, that is the blood flows faster when thinner. It also suggests that the blood flow is most rapid at the time of the greatest blood volume and cardiac output, with coincident return toward normal with these two functions. The venous pressure remains within normal limits and is constant for the last five months of pregnancy, with a slight postpartum rise. Both the systolic and the diastolic arterial blood pressure showed a slight rise in the last month of pregnancy, although the patients were normal and not "toxemic." It should be emphasized that after the eighth month, when there is maximum incidence of heart failure, there is return toward normal of values for blood volume, blood flow (circulation time, cardiac output) and blood content (hematocrit reading, viscosity). The incidence of heart failure decreases, corresponding with this return to normal of the circulatory functions.

our experience has been that normal pregnancy may accentuate anemia but not alone cause severe anemia.

Calculations of the viscosity of the blood during pregnancy, from studies of thirty-six women, show that it decreases, reaching a minimum during the ninth lunar

month, commences to return toward normal, that is, becomes more viscid, in the tenth lunar month and reaches normal in the puerperium.¹¹

It will be noted (chart 3) that the viscosity varies with the circulation time, that is, the thinner the blood, the faster it flows during pregnancy. This follows a well known physical law (Poiseuille's) which states that the less viscous the liquid, the more rapid its flow, all other factors being equal. Actually this may operate through increased cardiac output.

No adequate studies have been made of the veins, arteries and capillaries during pregnancy. Infra-red photographic studies³⁵ of the superficial veins of the normal pregnant woman have been made at this clinic. These showed clearly marked venous dilatation over the breasts and abdomen, with disappearance of the dilatation over the abdomen after delivery but persistence of the changes over the breasts until lactation ceased.

The placental circulation is of interest, as it is composed³⁶ of arteries connecting with veins through large vascular spaces without the interposition of other capillaries. This arrangement in the maternal portion of the placenta presents certain similarities to an arterio-venous fistula. This arrangement of the placental circulation has been suggested by Burwell³⁷ in an interesting presentation as an important factor in causing changes in the circulation during pregnancy. However, it does not appear to explain completely all the observed changes and as yet has not been demonstrated to be consistent with the fact of return toward normal before delivery of some of the circulatory functions.

A summary of the actual physiologic changes, as pictured in chart 3, gives a fairly clear idea as to some aspects of the increased burden on the heart in pregnancy. As pregnancy progresses the blood volume, the cardiac output and the velocity of blood flow increase. These increases commence early in pregnancy and progress steadily during pregnancy, reaching a maximum during the ninth lunar month. In the last month a return toward normal begins, with a consequent lightening of the burden on the heart.^{37a} In other words, contrary to popular belief, the return toward normal does not begin at delivery but at a period preceding it. Further evidence supporting this concept comes from electrocardiographic studies⁵ from this clinic, in which, as mentioned before, it was demonstrated that the left axis deviation of pregnancy begins to diminish not post partum but in the final weeks of pregnancy; x-ray studies of heart volume³⁸ also revealed a tendency to decrease toward normal not post partum but in the final weeks. If this concept of the circulatory burden is correct, how does it correlate with clinical experience?

If one examines the curve of onset of heart failure in pregnant women³⁹ with heart disease at this clinic,⁴⁰

35. Hersheimer, A.: Unpublished data.

36. Spanner, Rudolf: Mütterlicher und kindlicher Kreislauf der menschlichen Placenta und seine Strombahnen, *Ztschr. f. Anat. u. Entwicklungsgesch.* **105**: 163 (Nov.) 1935.

37. Burwell, C. S.: The Placenta as a Modified Arteriovenous Fistula. Considered in Relation to the Circulatory Adjustments to Pregnancy, *Am. J. M. Sc.* **195**: 1 (Jan.) 1938.

37a. The concepts here expressed were first presented by the authors at meetings of the New England Heart Association and appeared in abstract form in the *New England Journal of Medicine* **214**: 905, 1936, and **216**: 811, 1937.

38. Binhold, Horst: Das Herzvolumen in der Schwangerschaft, *Arch. f. Gynäk.* **154**: 251 (Sept.) 1933.

39. All are treated with a uniform regimen which features rest and restriction of activity.

40. Carr, F. B., and Hamilton, B. E.: Five Hundred Women with Serious Heart Diseases Followed Through Pregnancy and Delivery, *Am. J. Obst. & Gynec.* **26**: 824 (Dec.) 1933.

33. Kühnel, P.: Untersuchungen über die physiologische Schwangerschaftsanämie, *Ztschr. f. Geburtsh. u. Gynäk.* **90**: 511, 1927.

34. Yang, C. S., and Keefe, C. S.: The Anemias of Pregnancy, *Nat. M. J., China* **16**: 159 (April-June) 1930.

one observes that the highest incidence of heart failure is at the time when physiologically the burden on the heart is greatest. As the physiologic burden decreases, the incidence of failure decreases.⁴¹ Further evidence supporting this concept is drawn from the clinical improvement during the final month of pregnancy in the circulatory status of patients with chronic congestive heart failure. Obvious and clearcut clinical improvement has occurred in such patients, who, although at strict bed rest and under optimum treatment for several weeks or longer, had previously failed to show significant change. In other words, as the circulatory burden diminished during the tenth lunar month of pregnancy, there was associated clinical improvement of congestive failure in patients of the type described (chart 4). The practical lesson to be drawn from this is that in early pregnancy, with the burden increasing, the onset of heart failure usually demands termination of the pregnancy after compensation is restored. In the latter part of pregnancy one may safely await, in most instances, delivery through the pelvis at term, as the circulatory burden can be expected to decrease before delivery. One might almost be tempted to add a statement to the effect that one should be especially careful with pregnant cardiac patients during the sixth to ninth lunar months and supervise them most closely during that period, as it is the period of increasing burden; however, these patients must be supervised carefully during the entire course of pregnancy. Of course these rules are not absolute; they are, however, of great practical value and are based on both physiologic and clinical observations. The results in this clinic of treatment based on these rules⁴¹ bear further testimony to their validity.

There are no quantitative studies which throw any light on the question as to which constitutes the greater "strain" on the heart, pelvic delivery or cesarean section. In the absence of quantitative studies we may venture the clinical impression that labor as conducted in cases of cardiac disease⁴² at the Boston Lying-in Hospital is not a particularly great burden on the heart, probably not a greater one than the activities of the patient at home preceding labor or those attendant on the care of the child after delivery. As compared with cesarean section, with its common postoperative accompaniments of pain, distention and slight fever, delivery through the pelvis, as described, would seem to be associated with much less "cardiac strain." However, the proper evaluation of these two methods of delivery is an obstetric problem and probably will always remain one.

As a result of our studies covering five years, a few general points suggest themselves which may be helpful to others who plan to study the problems of pregnancy. Before studying pathologic problems in pregnancy it is wise to become acquainted with normal pregnancy, both the physiologic and the clinical picture. The normal pregnant woman varies in many ways from the non-pregnant woman, and many errors have been made because of the lack of appreciation of this fact. Though one cannot attribute to the pregnancy all changes that occur in a pregnant woman, certain specific and characteristic changes do occur in normal pregnancy and should be recognized. The most fruitful studies of

pregnancy seem to be those begun in the early part and continued through delivery and into the postpartum period. In a series of pregnant women, a significant number have some complication, such as toxemia, pyelitis or hemorrhage, which vitiates the study; therefore it is advisable to allow for this by starting with a larger number of patients than would otherwise be necessary. The obstetric literature is sadly lacking in studies on patients observed before the first pregnancy and through several pregnancies and the intervening periods. Complete studies of this type would no doubt settle many disputed points and seem indicated.

SUMMARY AND CONCLUSIONS

A careful evaluation of the variations in the cardiovascular status of the normal pregnant woman, with special regard to signs and symptoms, is necessary for

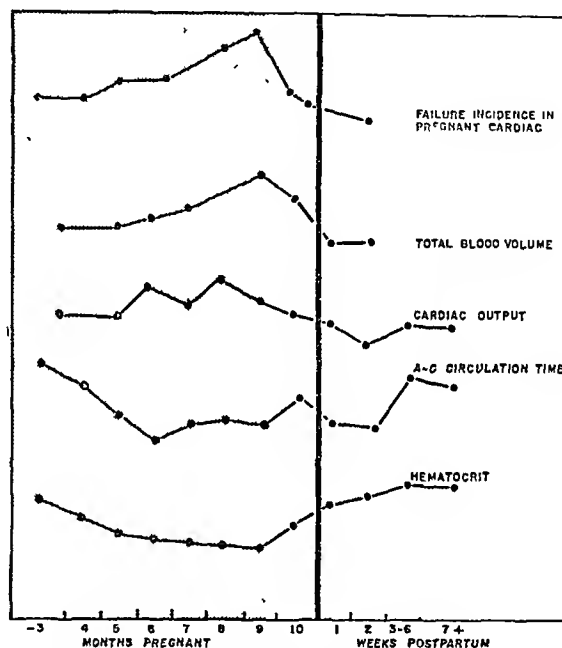


Chart 4—Circulatory burden on the heart in pregnancy. The dark area shows the time of increasing physiologic burden on the heart coincident with the increase in incidence of heart failure; the unshaded area shows the decrease of the burden ante partum, with coincident decrease in the incidence of heart failure. The heavy perpendicular line represents delivery and separates the antepartum and the postpartum period. Quantitative data for these curves appear in chart 3. The curve for cardiac output is from the data of Burwell.²²

avoidance of erroneous diagnoses of heart disease in normal pregnant women or heart failure in pregnant women with heart disease.

The vital capacity usually increases slightly during pregnancy; a significant decrease in vital capacity in a pregnant woman with heart disease forecasts impending heart failure and provides the earliest objective sign of it (charts 1 and 2).

The results of the physiologic studies of the circulation of pregnant women which contribute most information as to the circulatory burden may be summarized as follows:

1. The blood volume, velocity of blood flow and cardiac output increase during pregnancy to the ninth lunar month and then decrease prior to delivery.

2. The hemoglobin content and red corpuscle count per unit volume of blood and the hematocrit reading and viscosity of the blood decrease during pregnancy to the ninth lunar month and increase prior to delivery (chart 3).

41. Irving, F. C.: Personal communication to the authors.

42. Analgesia during the first stage of labor and elimination of the second stage of labor by forceps extraction with ether anesthesia at full dilatation.

Active rheumatic fever is not a significant factor contributing to heart failure during pregnancy and is notably rare at that time.

The significant factors predisposing to heart failure in pregnancy are, however, the physiologic changes just described, particularly the increase in blood volume, cardiac output and velocity of blood flow.

The onset of heart failure in pregnant women with cardiac disease occurs most frequently at the phase of pregnancy associated with the maximum increase in blood volume, velocity of blood flow and cardiac output. The frequency of heart failure diminishes during the last weeks of pregnancy and corresponds to the decrease in the values of these circulatory functions (chart 4).

It follows from both physiologic and clinical observation that heart failure in early pregnancy may be expected to grow worse as the circulatory burden increases and to improve during the predelivery period, as the circulatory burden diminishes.

THE MECHANISM OF ACTION OF QUININE IN MYOTONIA AND MYASTHENIA

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Wolf¹ was the first to point out the ability of quinine to relieve the difficulty in the muscular relaxation of patients with myotonia congenita and myotonic dystrophy. Later Kennedy and Wolf² commented on the increase in muscular weakness produced in patients with myasthenia gravis by the administration of quinine and, conversely, the increase in the degree of myotonia after the administration of prostigmine. These observations were fully corroborated by Kolb and his associates,³ who suggested that prostigmine would be of value when diagnosis was difficult, as in the condition described by Curschmann⁴ of myotonia sine myotonia. These authors also observed that small amounts of prostigmine could completely counteract the beneficial effect of quinine in myotonia, even when large doses of the latter drug were used. Harvey and Whitehill⁵ had previously discussed the value of quinine in the diagnosis of early cases of myasthenia gravis, when the objective improvement following prostigmine was not sufficiently clear cut. They also pointed out that alarming symptoms of respiratory distress and dysphagia might result when a small dose of quinine was given to a patient with moderately severe symptoms of myasthenia.

In its actions on these two diseases potassium chloride has been found to exhibit a similar contrast, but in the opposite direction. Laurent and Walther⁶

recorded improvements in myasthenia after oral administration of large amounts of potassium chloride, which they tried because of the observation of Feldberg and Vartiainen⁷ that it increased the sensitivity of the response of the superior cervical ganglion of the cat to acetylcholine and to stimulation of the preganglionic nerve. Russell and Stedman⁸ pointed out that it had an action similar to that of prostigmine in increasing the severity of the symptoms in myotonia.

Kennedy and Wolf² suggested that quinine was able to relieve myotonia by inhibiting the action of acetylcholine liberated at the motor nerve endings. As evidence in favor of this view they quoted the work of Stavrakys,⁹ who found that quinine acts directly as a paralyzing drug on the secretory fibers of the fibers of the auriculotemporal nerve. It was found, however, to inhibit the secretory effect of acetylcholine itself on the submaxillary gland, though physostigmine tended to restore to normal the action of the chorda tympani paralyzed by quinine. However, no really satisfactory explanation of these actions of quinine on diseases of human muscle has yet been formulated.

A pharmacologic investigation of the effects of quinine on neuromuscular conduction and on the contractile properties of skeletal muscle¹⁰ has revealed certain features of its effects, which suggest an explanation of its mode of action in these diseases, though the complete explanation must await more adequate knowledge of the pathogenesis of myotonia and myasthenia. Only those of its effects which are concerned with the action of quinine in these two diseases will be discussed here. These are as follows:

1. Quinine decreases the ability of the muscle to respond to and to hold a tetanus. This is due to an effect directly on the muscle, which increases its refractory period.

2. The excitability of the motor end plate is lowered, so that the response to nerve stimulation is reduced. This is best seen in a partially curarized muscle. When quinine is injected under these conditions, the curarization becomes complete. This action is also in large part responsible for the abolition by quinine of the quick response of a muscle to injected acetylcholine. For other features of the action complicating this picture, reference may be made to my full paper on the pharmacologic effects. Brown and his associates¹¹ had previously shown that curarine could remove the response to injected acetylcholine more readily than response to a motor nerve volley.

3. The normal potentiation of the twitches caused by physostigmine, and due to repetitive response to a single nerve volley, is prevented by the previous administration of quinine or is counteracted promptly when the drug is injected during a period of potentiation. Weiss¹² had found that the fibrillary twitchings produced in the cat by physostigmine were abolished by the intravenous injection of quinine.

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1. Wolf, Alexander: Quinine: An Effective Form of Treatment for Myotonia, *Arch. Neurol. & Psychiat.* **36**: 382 (Aug.) 1936.

2. Kennedy, Foster, and Wolf, Alexander: Experiments with Quinine and Prostigmine in Treatment of Myotonia and Myasthenia, *Arch. Neurol. & Psychiat.* **37**: 68 (Jan.) 1937.

3. Kolb, L. C.; Harvey, A. M., and Whitehill, M. R.: A Clinical Study of Myotonic Dystrophy and Myotonia Congenita with Special Reference to the Therapeutic Effect of Quinine, *Bull. Johns Hopkins Hosp.* **62**: 188 (March) 1938.

4. Curschmann, Heinrich: Dystrophia myotonica sine Myotonia, *Deutsche Ztschr. f. Neurol.* **15**: 161 1912.

5. Harvey, A. M.: Quinine as an Adjuvant to Prostigmine in the Treatment of Myasthenia Gravis, *Bull. Johns Hopkins Hosp.* **16**: 261 (Sept.) 1937.

6. Laurent, L. P. E., and Walther, W. W.: The Influence of Large Doses of Potassium Chloride on Myasthenia Gravis, *Lancet* **1**: 1434-1435 (June 22) 1935.

7. Feldberg, W., and Vartiainen, A.: Further Observations on the Physiology and Pharmacology of a Sympathetic Ganglion, *J. Physiol.* **83**: 105 (Dec. 14) 1934.

8. Russell, W. R., and Stedman, E.: Observations on Myotonia, *Lancet* **2**: 742 (Sept. 26) 1936.

9. Stavrakys, G. W.: Effect of Quinine on the Parasympathetic and Sympathetic Innervation of the Salivary Glands, *J. Pharmacol. & Exper. Therap.* **47**: 321 (March) 1933.

10. Harvey, A. M.: The Actions of Quinine on Skeletal Muscle, *J. Physiol.* **94**: 101 (Oct. 14) 1938.

11. Brown, G. L.; Dale, H. H., and Feldberg, W.: Reactions of the Normal Mammalian Muscle to Acetylcholine and to Eserine, *J. Physiol.* **87**: 394 (Sept. 8) 1936.

12. Weiss, Soma: The Action of Atropine, Quinine, Quinidine and Ouabain on the Fibrillation of Skeletal Muscles, *Proc. Soc. Exper. Biol. & Med.* **23**: 567, 1926.

4. The repetitive response to a single stimulus which occurs after veratrine is also removed by quinine. This occurs in both the normal muscle and the muscle of which the motor nerve has previously been cut and allowed to degenerate.

These observations offer a fairly satisfactory explanation of the effects of quinine in myotonia and myasthenia gravis, and also of the opposing action of prostigmine in these two conditions.

Although the exact nature of the disturbance in myasthenia gravis is not known, it has long been likened to partial curare poisoning¹³ and, as such, attributed to a diminution in the excitability of the motor end plates in the involved muscles. Blake Pritchard¹⁴ has shown that these muscles are not capable of maintaining a tetanus with a high frequency of nerve stimulation, although the tension developed in response to less rapid stimulation is normal and well maintained. His experiments again afford evidence for a depression of motor end plate response, a similar type of response occurring in a partially curarized mammalian muscle.¹⁵ Lindsley¹⁶ recorded the action potentials of voluntary contractions of single motor units in patients with this disease and found that they show an abnormal fluctuation in amplitude. This suggests that all the fibers in the single motor unit do not respond to every nerve impulse. These observations could be interpreted by supposing that the end plate threshold is raised in these patients or, as an alternative, that the concentration of acetylcholine released by an impulse is subliminal for the stimulation of some of the fibers. Any drug which has a curariform action, as quinine has, would in either case cause an increase in the severity of the symptoms. Physostigmine or prostigmine might act by retarding the destruction of normally subliminal charges of acetylcholine liberated at some motor nerve endings. On the other hand, the possibility is not excluded that these alkaloids may have an effect in lowering the threshold of end plate excitability, independent of their antiesterase actions. The fact that guanidine will relieve the myasthenic condition, as recently demonstrated by Minot and her associates,¹⁷ shows that antiesterase action is not necessarily involved in such a remedial effect. Guanidine has no appreciable antiesterase action.¹⁸ It may be noted in that connection that quinine, which has an opposite action to that of prostigmine in myasthenia, also has a definite, though relatively weak, inhibiting effect on the action of cholinesterase.¹⁹

The localization of the disturbance in myotonia is much less certain. Lindsley and Curnen²⁰ have demonstrated oscillatory action potentials during the period of the slow relaxation. They express the opinion that this indicates a neurogenic rather than a myogenic phenomenon, and they advance the hypothesis that the after-contraction is of reflex origin and due to persistent

discharge of hyperexcitable end organs in the muscle. This theory, however, does not seem tenable, since anesthesia of the motor nerve does not abolish myotonia mechanically produced, as shown by Schaefer,²¹ nor does spinal anesthesia, as demonstrated by Kennedy and Wolf.² In view of the fact that myotonia presents a contrast to myasthenia, both in its clinical features and in the responses given to various drugs, it seems most likely that the abnormality is one of neuromuscular transmission, the threshold of the end plates being lower, or the transmitter of excitation from the nerve endings being more slowly destroyed, than in the normal muscle. The response of the myotonic muscle to a single nerve volley would then, in either case, be similar to that of a muscle under the influence of physostigmine in that it would respond repetitively. Any drug with a curare-like action on the excitability of the end plates would then diminish this effect and alleviate the myotonus. On the other hand, it has been shown by Wilson and Wright²² that potassium ions have an antagonistic effect to that of curare and lower the threshold at the motor end plates. It is therefore in accordance with expectation that potassium salts are beneficial in myasthenia gravis and increase the severity of myotonus.

There still remains, however, the possibility that myotonia is due to an abnormality of the whole muscle fiber rather than of the end plate alone, resembling that of a muscle treated with veratrine. It has been shown that the refractory period of skeletal muscle is increased by quinine and that this causes a diminution in the ability of even a denervated muscle to hold a tetanus and likewise abolishes the repetitive nature of the response under veratrine. This action of quinine would explain its effect in relieving myotonus, if this abnormality was due to a change in the muscle fibers, causing them to respond repetitively to a stimulus of any kind and not merely to the normal excitation through the nerve.

On the whole, however, my results with quinine strengthen my belief that the disturbances in these two diseases are at the motor end plates. Such a conception gives a reasonably satisfactory explanation of the effects of various drugs on the two conditions; but there is, as yet, no clue to the fundamental processes responsible for the suggested alterations in end plate excitability.

SUMMARY

1. The existing evidence suggests that myasthenia gravis and myotonia are due to abnormalities of neuromuscular transmission. If these are regarded as due to changes in the excitability of the motor end plates of the muscles involved, the excitability would be lower in myasthenia and higher in myotonia than in the normal muscle.

2. Quinine has a curare-like action by which it decreases the excitability of the end plates. This effect would account for its ability to improve myotonia and to increase the severity of the myasthenic state. Physostigmine and potassium chloride, as would be expected, both produce effects on these two conditions, which are in each case the opposite of those produced by quinine.

13. Oppenheim, Hermann: Die myasthenische Paralyse (Bulbär-paralyse ohne anatomischen Befund), Berlin, S. Karger, 1901.

14. Pritchard, E. A. B.: The Occurrence of Wodensky Inhibition in Myasthenia Gravis, *J. Physiol.* 78: 3P (May 23) 1933.

15. Briscoe, Grace: The Antagonism Between Curarine and Prostigmine and Its Relation to the Myasthenia Problem, *Lancet* 1: 469 (Feb. 29) 1936.

16. Lindsley, D. B.: Myographic and Electromyographic Studies of Myasthenia Gravis, *Brain* 58: 470 (Dec.) 1935.

17. Minot, Ann S.; Dodd, Katharine, and Riven, S. S.: The Response of the Myasthenic State to Guanidine Hydrochloride, *Science* 87: 348 (April 15) 1938.

18. Kahlson, G.: Personal communication to the author, 1938.

19. Kahlson, G., and Uvnäs, B.: Die cholinesterase sowie der spezifischen Rezeptoren und ihrer Wirklichkeit kontraktile Substrate, *Skandinav.* 1938.

20. Lindsley, D. B., and Curnen, E. C.: An Electromyographic Study of Myotonia, *Arch. Neurol. & Psychiat.* 35: 253 (Feb.) 1936.

21. Schaefer, H.: Zur Analyse d. myotonischen Bewegungstörung, *Deutsche Ztschr. f. Nervenhe.* 67: 225, 1921.

22. Wilson, A. T., and Wright, S.: Anticuraric Action of Potassium and Other Substances, *Quart. J. Exper. Physiol.* 26: 127 (Oct.) 1936.

SPONTANEOUS PNEUMOTHORAX IN
ANTHRACOSILICOSIS

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Interest in the pulmonary dust diseases has been stimulated by their inclusion in many states among the compensable occupational diseases. The pathologic clinical and roentgenologic aspects of the pneumoconioses have been extensively described.

Spontaneous pneumothorax complicating pneumoconiosis has been reported from time to time, but there appear to be no definite data as to its frequency. Furthermore, there are no studies comparing the incidence of the condition in simple pneumoconiosis with the incidence in pneumoconiosis associated with tuberculosis.

Most reports concern pneumocotic tuberculosis, and Ickert¹ has stated that according to his experience and that of Redeker pneumothorax is found in pneumoconiosis only when the pneumoconiosis is associated with tuberculosis. During the past few years, however, spontaneous pneumothorax occurring in cases of pneu-

(3.5 per cent). Among the 307 patients with coexisting tuberculosis it was seen in fourteen (4.5 per cent); it also occurred in one instance in association with pulmonary metastasis (0.3 per cent) (table 1).

The ages of the patients ranged from 25 to 52 years and they had been exposed to mine dust for periods ranging from three to thirty-six years (table 2).

Eight patients had second stage and fourteen third stage anthracosilicosis. In three instances the pneumothorax was bilateral, in nineteen unilateral. Of the cases of unilateral involvement, the left side was affected in eleven and the right side in eight.

In five patients pleural effusion developed. In three the anthracosilicosis was uncomplicated; in two there was coexisting tuberculosis. In only one, however, was there sufficient fluid to require removal.

Of the seven patients with uncomplicated anthracosilicosis, one died. Of the fifteen with a complication, the patient with carcinomatosis and ten of the fourteen with tuberculosis died.

The diagnosis of uncomplicated anthracosilicosis was made by applying the criteria for the differentiation of simple anthracosilicosis from anthracosilicotic tuberculosis described by one of us (M. J. S.).⁸ Repeated analyses of the sputum showed no tubercle bacilli, and no evidence of tuberculosis was found on serial x-ray examination. In addition, there was no severe hemoptysis, marked toxemia or extensive cavity formation and no extrapulmonary tuberculous complication. In one case no evidence of tuberculosis was seen at necropsy.

CLINICAL AND ROENTGENOLOGIC FEATURES

Advanced pneumoconiosis is always associated with inflammatory reaction in the pleura, and in this group of anthracosilicotic patients evidence of extensive adhesions was found in every case. The symptoms produced by rupture of the pleura appeared to depend primarily on the extent to which the pleural space was obliterated by these adhesions and were in the main the result of further reduction of the breathing capacity in persons already having considerable dyspnea because of preexisting pulmonary disease.

In a few patients small encapsulated collections of air were seen. These produced no symptoms and were discovered only by routine x-ray examination; the air was eventually absorbed and the clinical course unaffected. In all but one case the localized pneumothorax was located in the upper part of the chest.

In patients in whom the pleural surfaces were sufficiently free to permit the collection of a large amount of air, perforation of the pleura was of serious consequence. Perhaps the most striking feature in this group was the extreme distress caused by a combination of intense dyspnea and a sense of impending suffocation. Severe pain in the chest and a feeling of constriction or pressure on the affected side were common complaints, and the symptoms of shock were present in many cases.

The severe reactions precipitated by spontaneous perforations of the pleura were poorly borne. This was especially true of the patients who prior to the accident were greatly debilitated or markedly dyspneic. The severity of this accident is reflected in the high mortality with which it is associated, particularly in the group with superimposed tuberculosis. One patient died within a few minutes after the accident, one three hours after and two within twenty-four hours.

8. Sokoloff, M. J.: Anthracosilicosis and Tuberculosis, *Am. Rev. Tuberc.* 34: 700-711 (Nov.) 1936.

TABLE 1.—Summary of Cases

	Number of Cases	Cases of Pneumo- thorax	Percent- age
By carcinoma.....	1	14	4.5
Total.....	307	22	

moconiosis without complicating tuberculosis has been reported with increasing frequency. Hofbauer² in describing such a case discussed two similar ones which had come to his attention. Ketterer,³ Snyder,⁴ Breton and Eloire⁵ and Brulé and his co-workers⁶ have considered this condition of sufficient rarity to report individual cases in detail. De Léobardy and Pasquet⁷ have called attention to a case of bilateral pneumothorax occurring under similar conditions.

To determine the frequency of spontaneous pneumothorax as a complication of pneumoconiosis, we have reviewed the records of 507 anthracite coal miners incapacitated by chronic pulmonary disease. All these men had anthracosilicosis; 308 (60.7 per cent) had coexisting pulmonary tuberculosis and one had metastatic pulmonary carcinomatosis.

Pneumothorax occurred spontaneously in twenty-two (4.3 per cent) patients. Among the 199 patients with simple anthracosilicosis it was found in seven

From the White Haven Coal Mine, White Haven, Pa.
Read before the Laënnec Society, Philadelphia, Pa., 28, 1938.
1. Ickert, F.: Staublung, *Forsch.* 3: 431-514, 1931.
2. Hofbauer, Alfred: Spontaneum Pneumothorax bei Lungensilikose, *Beitr. z. Klin. d. Tuberk.* 83: 1-10, 1931.
3. Ketterer, C. H.: Spontaneum Pneumothorax bei Aortie Aneurysm und Pulmonary Fibrosis, *Am. Rev. Tuberc.* 27: 553-558 (June) 1933.
4. Snyder, Maurice: Successive Spontaneous Pneumothorax Due to Silicosis, *J. Kansas M. Soc.* 37: 441-444 (Nov.) 1936.
5. Breton and Eloire: Un cas de pneumothorax spontané chez une silicotique, *Bull. et mém. Soc. de radiol. méd. de France* 25: 189-193 (March) 1937.
6. Brulé, M.; Huguenin, R.; Hillemand, P., and Gilbrin, E.: Pneumothorax spontané au cours d'une pneumoconiose, sans tuberculose anatomiquement décelable, *Bull. et mém. Soc. méd. d. hôp. de Paris* 49: 424-449 (April 3) 1933.
7. de Léobardy and Pasquet: Pneumothorax spontané bilatéral à rechutes, silicose pulmonaire et tuberculose miliaire, *Rev. de la tuberc.* 13: 375-390 (April) 1932.

The x-ray picture of pneumothorax in association with anthracosilicosis has certain distinctive characteristics. The dust-laden lung, containing as it does an excessive amount of fibrous tissue, is still of considerable volume, even when collapsed under high pressure. There are in addition, nearly always, extensive adhesions which partially anchor the lung to the wall of the chest at one or more points. Because of these two factors, the increased density of the lung parenchyma and the adhesions, the compressed lung is not as greatly reduced in volume as when pneumothorax occurs in other conditions, nor is it pushed as far downward and backward; instead, it is suspended as a compact mass in the pneumothorax cavity. The fixed semirigid lung acts as a shield and prevents the full force of the increased pressure from being directed against the heart and the mediastinal structures. Thus shifting of the heart and mediastinum is not as extreme as with high-tensioned pneumothorax associated with other conditions. The main force is exerted on the diaphragm and the thoracic wall, so that downward displacement of the diaphragm and increase in size of the thorax on the affected side are nearly always present, particularly if the pneumothorax space is large.

Röntgenologically, pneumothorax has to be differentiated from emphysematous blebs and pulmonary cysts. The three conditions are characterized by increased aeration of a part of the pulmonary fields. However, attenuated bands of pulmonary tissue can usually be made out in the blebs and cysts, while they are absent in pneumothorax. When the pneumothorax is large or occupies the lower lateral aspect of the thoracic cavity, the edge of the lung can be seen. The pneumothorax frequently changes in size, while blebs and cysts present a more or less constant appearance.

BILATERAL SPONTANEOUS PNEUMOTHORAX

Simultaneous bilateral spontaneous pneumothorax complicating pneumoconiosis is rare. In a comprehensive review of the literature Glickman and Schlomovitz⁹ found only six cases, and to these they added one of their own.

Our series of twenty-two cases includes three in which the perforations were bilateral. One of these has been previously reported by Norris and Landis¹⁰ and is included in the group collected by Glickman and Schlomovitz.

CASE 1.—A man aged 41, who had been employed in the mines for twenty-nine years, had third stage anthracosilicosis complicated by tuberculosis, with tubercle bacilli in the sputum. There was a great amount of air in both pleural cavities, but this was entirely absorbed before his death, which occurred three months after the perforation.

CASE 2.—A man aged 43, who had been exposed to mine dust for ten years, had third stage anthracosilicotic tuberculosis, with tubercle bacilli in the sputum. The pneumothorax was asymptomatic, with a collection of air along the lateral margin of the upper lobe of the right lung and a small pocket of air over the upper lobe of the left lung. This patient also died.

CASE 3.—A man aged 51, who had been engaged in coal mining for thirty-six years, had perforations which occurred suddenly and were characterized by severe pain in the chest and collapse. X-ray examination revealed advanced third stage pneumoconiosis, with both lungs partially compressed by pneumothorax. On the right side the air collected at the base and on the left over the upper lobe. No tubercle bacilli were found

in the sputum on repeated analyses, but the patient was considered to be tuberculous because of the x-ray picture and the severe toxemia. He is still under treatment, and with him also there has been absorption of the air, with complete reexpansion of both lungs.

CONCLUSIONS

Conditions which favor the development of spontaneous pneumothorax are always present in anthracosilicosis, either as a direct result of the action of the dust or as a complication. Emphysema, which plays an important part in the production of spontaneous pneumothorax, is a constant accompaniment of anthracosilicosis. Bleb formation is frequent in association with this emphysema, and the tendency of the blebs to rupture constitutes a hazard in every anthracosilicotic patient. The possibility of the development of pneumothorax is further increased by the presence of adhesions, which may be responsible for the entrance of air into the pleural space by tearing the visceral pleura at

TABLE 2.—Distribution of Cases

Case Number	Age	Years of Mining	Stage	Type	Result
Uncomplicated Anthracosilicosis					
1	47	20	2	Left hydropneumothorax	Unimproved
2	36	15	3	Right pneumothorax	Died
3	33	12	2	Left pneumothorax	Improved
4	50	27	3	Left hydropneumothorax	Improved
5	45	26	3	Left hydropneumothorax	Improved
6	37	13	2	Right pneumothorax	Improved
7	37	25	3	Right pneumothorax	Improved
Anthracosilicosis Complicated by Tuberculosis					
1	51	30	3	Right hydropneumothorax	Unimproved
2	48	23	2	Left pneumothorax	Improved
3	51	25	3	Right pneumothorax	Died
4	39	17	2	Left pneumothorax	Died
5	50	27	3	Right hydropneumothorax	Died
6	38	18	3	Left pneumothorax	Died
7	41	29	3	Bilateral pneumothorax	Died
8	48	24	2	Left pneumothorax	Died
9	43	10	3	Bilateral pneumothorax	Died
10	25	3	2	Right pneumothorax	Died
11	36	13	2	Left pneumothorax	Died
12	51	36	3	Bilateral pneumothorax	Improved
13	52	30	3	Left pneumothorax	Died
14	48	28	3	Left pneumothorax	Improved
Anthracosilicosis Complicated by Carcinomatosis					
1	48	25	3	Right pneumothorax	Died

their insertions. The coexistence of tuberculosis was another factor contributing to pleural accidents. Since tuberculosis is considered the most common cause of spontaneous pneumothorax, it is reasonable to assume that this condition should occur frequently in patients with anthracosilicotic tuberculosis. The severe cough, which is a predominant symptom, supplements the influence of these three factors, and the resulting strain may cause rupture of the pleura at its weakened points.

It would appear therefore that in anthracosilicotic patients there exists a combination of conditions which are ideal for the development of spontaneous pneumothorax. However, in spite of the presence of so many factors which tend to produce perforations of the pleura, the accident occurred in only twenty-two (4.3 per cent) of a group of 507 anthracite coal miners.

The reason for this low incidence is revealed by study of the pathologic changes resulting from irritation by the dust. In most patients there is an inflammatory reaction in the visceral pleura accompanying that in the lung. This progresses as the amount of dust in the lung increases, so that in the extreme grades of anthracosilicosis tremendous pleural thickening results. In other patients both the visceral and the parietal layers of the pleura are involved in the reaction, leading to

9. Glickman, L. G., and Schlomovitz, B. H.: Simultaneous Bilateral Spontaneous Pneumothorax Complicating Pneumoconiosis, *Am. Rev. Tuberc.* 34: 390-401 (Sept.) 1936.

10. Norris, G. W., and Landis, H. R. M.: *Diseases of the Chest and Principles of Physical Diagnosis*, ed. 5, Philadelphia, W. B. Saunders Company, 1933, p. 720.

obliteration of the pleural space. Since the thickened or adherent pleura can be neither perforated nor torn easily, it affords definite protection against the development of spontaneous pneumothorax and tends to overcome the effect of the factors producing the condition.

SUMMARY

Twenty-two cases of spontaneous pneumothorax were found among 507 coal miners disabled by anthracosilicosis (4.3 per cent). Seven cases were among 198 patients with simple anthracosilicosis (3.5 per cent) and fourteen among 308 patients with coexisting tuberculosis (4.5 per cent). In one case the lesion occurred in association with pulmonary metastasis.

In three instances the pneumothorax was bilateral. Two of these, reported here for the first time, make a total of nine cases of bilateral spontaneous pneumothorax in pneumoconiosis reported in the literature to date.

The conditions may be either asymptomatic or associated with severe symptoms; for the latter type the prognosis is grave.

Emphysema, pleural adhesions, tuberculosis and the accompanying severe cough favor the development of pneumothorax in anthracosilicosis.

The effects of these forces are largely overcome by thickening of the visceral pleura or obliteration of the pleural cavity, practically constant features of anthracosilicosis.

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POSTURAL TREATMENT OF ACUTE LARYNGOTRACHEOBRONCHITIS

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With tragic abruptness a child with an apparently ordinary infection of the upper respiratory tract with moderate difficulty in breathing may choke up suddenly, fight desperately for air for a short time and die, and at autopsy the appearances of acute laryngotracheobronchitis are found. Though there may have been few physical signs, the tracheal and bronchial mucosa may be red, thick and even ulcerated, the bronchi and bronchioles may be filled with thick secretions, plugs or crusts, and areas of the lungs may be atelectatic or emphysematous.

Some men have never recognized such a condition and consider it a rarity. Others who have not seen what early and proper treatment can do for it think it hardly more than an academic problem to be studied post mortem. In the light of published experiences there can be no doubt that it occurs often and that, while it is serious, with decision, energetic treatment and unremitting care the prognosis may not be bad. Ten cases of this condition in which cannulation was required are here reported, with two deaths.

A rather clear picture of the condition has been given in the past twenty years by Baum,¹ Gittins,² Jackson,³

Richards,⁴ Smith⁵ and others. Certain facts seem to have been rather definitely established, and these will be briefly reviewed. If not indeed a true clinical entity, it has definite recurring characteristics determined by anatomic, physiologic and bacterial factors. Its occurrence is not very rare, and it may be reported more often when it is generally appreciated and recognized. The mortality, according to Jackson,³ averages 70 per cent, although large group reports vary from 33 to 75 per cent.

Symptoms are likely to include those of a mild infection of the upper part of the respiratory tract followed by cough, hoarseness, increasing stridor, restlessness, dehydration, sepsis of varying degree and signs of cardiac and general exhaustion. Obstructive symptoms usually dominate the picture, though these may be slight if the obstruction is low in the bronchial tree or if sedatives have been given. Cyanosis is an alarming symptom, especially the pale cyanosis of exhaustion seen perhaps more often in low obstruction. The severity of symptoms is out of proportion to physical and roentgenologic observations.

Primary involvement may be chiefly of the larynx or subglottic areas, of the trachea or of the bronchi. Usually the process appears to descend from the larynx and the whole respiratory tree is likely to suffer. Richards⁴ and others have well described the end state seen post mortem, and the Jacksons³ have given in detail the living pathologic picture as related to the symptoms.

Diagnosis should not be difficult. Diphtheria, foreign body, croup, laryngismus stridulus and other causes of respiratory difficulty are to be ruled out, if necessary by direct laryngoscopy or by bronchoscopy. The sudden onset of cyanosis with restlessness, especially if not explained by physical signs and particularly in the type of case considered an atypical bronchopneumonia, should call into consideration this disease.

The following two points may be worth further discussion: 1. Progressive and irreversible changes are caused early by laryngotracheal obstruction in the presence of infection so that relief must not be long delayed. 2. Postural drainage and irrigation are valuable measures which have not been fully appreciated in treatment.

In order to visualize the processes of this condition, to understand the varying picture and to judge how soon it may be necessary to intervene to prevent irreparable damage, it may be useful to review some of the experimental work on obstruction of the airway as well as that on the pathogenesis of acute pulmonary infections.

Since 1844 many observers have shown that atelectasis and emphysema can be produced by bronchial obstruction. Coryllos and Birnbaum⁶ attempted to show that the important condition was prevention of the entrance of air and absorption of that remaining. Jackson and Manges⁷ demonstrated that foreign bodies especially of the vegetal type might have the same effect. Galbraith and Steinberg's⁸ experiments seem to show

4. Richards, L.: Fulminating Laryngotracheobronchitis, *Ann. Otol. Rhin. & Laryng.* 42: 1014 (Dec.) 1933.
5. Smith, W. Jewell: Acute Laryngotracheitis in Children, *Arch. Otol.* 23: 420 (April) 1936. This has a good recent bibliography.
6. Coryllos, P. N., and Birnbaum, G. L.: Obstructive Massive Atelectasis of the Lung, *Arch. Surg.* 16: 501 (Feb.) 1928.
7. Jackson, C. L.; Spencer, W. H., and Manges, W. F.: The Diagnosis and Localization of Nonopaque Foreign Bodies in the Bronchi, *Am. J. Roentgenol.* 7: 277 (Jan.) 1920.
8. Galbraith, E. G., and Steinberg, B.: The Developmental Mechanism of Pulmonary Atelectasis, *Ann. Otol. Rhin. & Laryng.* 46: 807 (Sept.) 1937.

From Northwestern University Medical School.
Read before the American Laryngological Association, Atlantic City, N. J., May 2, 1938.
1. Baum, H. L.: Acute Laryngotracheobronchitis, *J. A. M. A.* 91: 1097 (Oct. 13) 1938.
2. Gittins, T. R.: Laryngitis and Tracheobronchitis in Children. Reference to Nondiphtheritic Infections, *Ann. Otol. Rhin. & Laryng.* 45: 1165 (Dec.) 1936.
3. Jackson, Chevalier, and Jackson, C. L.: Acute Laryngotracheobronchitis, *J. A. M. A.* 107: 929 (Sept. 19) 1936.

that the essential factor is interference with respiratory movements due often to obstruction but often also to other causes which prevent inflation and deflation of the alveoli, leading to secondary vascular changes. The changes that they considered most important are congestion, stasis, edema and transudation.

Kernan and Barach⁹ emphasized the importance of these circulatory effects and concluded that "as a result of the continued obstruction and the elevated negative pressure in the chest, blood enters the right chamber of the heart and lungs more freely but is retarded in its departure from the lungs into the left heart as a result of the backward suction pressure on the left ventricle as it delivers blood into the extrathoracic aorta. The elevated negative pressure within the chest exercises suction on the capillary walls, which is the important factor in the production of intra-alveolar exudate." They believe that air is absorbed with production of atelectasis and that emphysema comes from increasing distention of the alveoli during inspiration, with rupture of blood vessels and giving way of damaged alveolar wall. Increasingly greater respiratory effort keeps up a vicious circle.

For a clearer picture of what happens when infection is superimposed on these mechanical factors one may turn to recent work on the pathogenesis of pneumonia. Nungester and Jourdonais¹⁰ were able to initiate pneumonia in dogs by introducing bacteria protected by mucin. Edema fluid carries from this focus multiplying bacteria. The spread from the primary infection, according to Loeschke¹¹ after many postmortem examinations of human material, is by gravity and by positive pressure of exudate in a lung that has negative pressure. According to Gunn,¹² spreading areas coalesce and, if bronchi are not blocked, the exudate flows into open alveoli of lobe or lobule and there are deposits of fibrin, leukocytic infiltration and the progressive changes of pneumonia.

If fibrinous plugs or infected exudate block a whole lobe there may be lobar pneumonia, which Coryllos and Birnbaum¹³ considered really massive atelectasis with infection by pneumococci.

In view of the experiments of Galbraith and Steinberg⁸ it seems also that, if there is much secretion and yet not enough to block all the bronchioles and so cut off the interlobular peripheral airways of Van Allen,¹⁴ lobular pneumonia may result. If a plug blocks a bronchus or if so many of the bronchioles are blocked by thick secretion that the peripheral interlobular respiratory mechanism does not operate, one can think that absorption of air and atelectasis might occur early before the open alveoli can fill with exudate, with the picture as it is in acute laryngotracheobronchitis.

The bacteria present, the reaction of the tissue to them and especially the character of exudate or transudate produced may have much to do with the end result, as already stated with regard to lobar pneumonia. Reports vary widely as to the organism most common in tracheobronchitis, the hemolytic streptococcus usually

being given first place. Bradford and Leahy¹⁵ believe that the usual cultural methods allow this organism to overgrow. By a careful plating technic they showed in a series of thirty-six cases that green-forming streptococci were predominating and that most cultures ran less than 5 per cent of the hemolytic streptococcus. The tissue reaction to this organism seems perhaps more compatible with the usual observations.

A rather narrow margin of chance may determine the end result in certain cases of respiratory infection. It may be that when primary obstruction is late or incomplete, and exudate early invades open alveoli, the picture is one of lobar or lobular pneumonia. If there is primary obstruction with absorption of air or if the primary process causes the outpouring of thick secretion or fibrinous plugs to block regional bronchioles before the alveoli are infected, atelectasis occurs, usually with emphysema. If the patient survives, the train of results may be as noted by Galbraith and Steinberg⁸ in experimental animals: atelectasis, pneumonitis, local necrosis, abscess formation, with later lung abscess or bronchiectasis.

That the picture may be a composite of these two types of process is evidenced by many clinical observations. Holt¹⁶ observed that emphysema occurred in the majority of children dying of lobular pneumonia. Snow and Cassasas¹⁷ observed roentgenologically in many cases resembling bronchopneumonia patchy atelectasis and emphysema with shifting roentgen and physical changes. They noted that the greatest involvement was in the dependent portions. It is observed that cyanosis in lobular pneumonia, especially of the influenzal type, may be of rather rapid onset and out of proportion to the physical changes.

This also would indicate that many of these cases might be amenable to the treatment to be outlined, although, as Jackson,⁸ Gittins² and others emphasize, many cases considered bronchopneumonia must be laryngotracheobronchitis. It is interesting to note that Kernan⁹ did bronchoscopic aspiration in lobar pneumonia with reported benefit.

It may perhaps be assumed, then, that the sequence of events in acute laryngotracheobronchitis is somewhat like this: An infection involves the larynx and subglottic tissues, and congestion and edema lead to nearly enough complete obstruction to raise the negative intrathoracic pressure, with added congestion, edema, exudate and capillary damage. Then thick secretion blocks bronchi or bronchioles whose walls are already swollen. As spreading secretion blocks the regional bronchioles, the interlobular tracts are cut off, air in the alveoli becomes absorbed, the dependent portions become atelectatic and the overlying ones become emphysematous. Infection and local circulatory changes add to the exudate, to absorption of air, to atelectasis and to emphysema and put out of commission more lung bed and further embarrass the heart. Cardiac and general exhaustion may here draw the final curtain.

The foregoing has been detailed to show that the problem is not one simply of blocked airway with anoxemia and perhaps sepsis and increased cardiac and respiratory effort and finally exhaustion but that the

9 Kernan, J. D., and Barach, A. L.: Role of Helium in Cases of Obstructive Lesions in the Trachea and Larynx, *Arch. Otolaryng.* 26: 419 (Oct.) 1937.

10 Nungester, W. J., and Jourdonais, L. F.: Mucin as an Aid in the Production of Experimental Pneumonia, *J. Infect. Dis.* 59: 258 (Nov.-Dec.) 1936.

11 Loeschke, H.: Untersuchungen über die Kruppöse Pneumonie, *Beitr. z. path. Anat. u. z. allg. Path.* 86: 201-223 (Jan.) 1931.

12 Gunn, F. D.: Pathogenesis of Pneumonia, *M. Clin. North America* 22: 3 (Jan.) 1938.

13 Coryllos, P. N., and Birnbaum, G. L.: Lobar Pneumonia Considered as Pneumococcal Lobar Atelectasis of the Lung, *Arch. Surg.* 18: 190 (Jan.) 1929.

14 Van Allen, C. M., and Lindsborg, G. E.: Collateral Respiration in the Lung, *Surg., Gynec. & Obst.* 53: 16 (July) 1931.

15 Bradford, W. L., and Leahy, Alice D.: Acute Obstructive Laryngitis. Clinical and Bacteriological Study, *Am. J. Dis. Child.* 40: 298 (Aug.) 1930.

16 Holt, L. E.: The Diseases of Infancy and Childhood, New York, D. Appleton & Co., 1920.

17 Snow, William, and Cassasas, C. S. B.: Obstructive Emphysema, and Atelectasis in Influenza, *J. A. M. A.* 109: 1886 (Dec. 4) 1937.

process is much more complex. Grave secondary changes may at any time supervene and then any treatment may be unsuccessful.

In other words, the patient is likely to be saved early or not at all. This means that, if a trial of oxygen therapy and other measures does not give relief, tracheotomy is to be done without further delay. Cyanosis and rapid pulse are really late signs of imminent heart failure and must not be waited for.

In the condition herein discussed, bronchoscopic aspiration is often a necessary and life-saving procedure. As an adjunct, postural drainage seems to have been neglected, as there was no emphasis on its use in tracheobronchitis, even though mention is frequently made of the adverse effects of gravity on secretion. Postural treatment is widely used by chest surgeons and internists, but there is little about it in the medical literature.

Nelson¹⁸ showed that even in bronchiectasis, in which sputum is viscid and tenacious, proper postural drainage was very effective and resulted in at least temporary cures. He insisted on the patient lying inverted with the hips over a double inclined plane, with the position maintained for days or even weeks with only very brief interruptions. Cures by it have been seen in early cases of bronchiectasis in children, and it is usually part of the medical routine in abscess of the lung.

One pediatrician¹⁹ who sees many patients states that for a year he has treated influenza by postural drainage and has not had one case of pneumonia develop in such patients.

Postural drainage must be such that a real gradient is maintained from the main lower bronchial area to the trachea and larynx. According to Morlock²⁰ this should mean at least 15 degrees elevation of the foot of the bed, but better as much as the patient will tolerate, which will increase with use. In children the prone position with the foot of the bed raised provides a much better gradient and it is usually accepted easily.

Having in mind the physiopathology of acute laryngo-tracheobronchitis it would seem that here postural drainage would be especially valuable. The usual protective mechanism fails, secretion not being moved by cough, tussive squeeze or ciliary action. Secretion as it is first formed, whether as mucus, transudate, exudate or hemorrhage poured out in trachea, bronchi or bronchioles, must first be fluid and will flow some distance along the dependent wall before it forms plugs or crusts. At first at least ciliary action probably helps, and Leonard Hill²¹ showed that cilia from the horse's trachea moved material twice as fast in the horizontal as in the vertical position. Murphy²² injected into the bronchi of cats material of the viscosity of secretions found in asphyxia neonatorum and demonstrated that gravity drainage would clear the tracheobronchial tree.

If secretion can flow to the areas of greater cough reflex, tussive squeeze and cough will be much more effective. If any cough, squeeze or ciliary action is left, the help of gravity will be important. If secretion stagnates, it should be as a spread dependent layer and not as an occluding mass lying in a bronchial well. If plugs or crusts form, they will be nearer the outlet as we have observed bronchoscopically after instituting

postural drainage and will be more likely to be expelled by cough, or will be more accessible to removal by aspiration or bronchoscopy.

Lavage of the respiratory tract has been proved feasible by Stitt²³ and by Minter,²⁴ the latter using as much as 400 cc. of fluid at a time in adults. Gittins² in tracheobronchitis used epinephrine and physiologic solution of sodium chloride in small amounts, aspirating it afterward. Richards⁴ showed that solution of sodium bicarbonate tends to soften and dissolve plugs.

If one is to use fluid it would seem that after it is instilled the inverted posture should be used to guarantee its return and also to aid in the movement of secretion and plugs toward the tracheotomy opening. In recent cases from 4 to 15 cc. of from 3 to 5 per cent of warm solution of sodium bicarbonate at a time has been dropped into the tracheotomy tube with inspiration, usually with the gratifying result that it stirred up vigorous coughing, so that it was presumably drawn back and forth over crusts and plugs. This was carried out with the head elevated and the child turned toward the side on which the stethoscope indicated the greatest blocking. The head was then lowered and suction was used by a catheter through the tracheotomy tube. Physiologic solution of sodium chloride or Ringer's solution followed to wash out the sodium bicarbonate. Intermittently when there was much blocking epinephrine solution 1:10,000 was used; the stronger solution is known to produce undesirable secondary congestion in the nose. This treatment has proved of much value in recent cases, although it cannot supplant entirely bronchoscopic aspiration and forceps removal of crusts. It proved especially valuable in cases in which even a 3.5 mm. bronchoscope could not be passed. A capable intern can be trusted to use postural irrigation and save the laryngologist constant attendance and the patient tiring bronchoscopies.

SUMMARY

The treatment, briefly outlined, is as follows:

1. Rest—physical and mental—so that minimum oxygen is required.
2. No opiates or atropine.
3. Oxygen by tent, hood or catheter or into the tracheotomy tube. It is better given with helium with moderate positive pressure according to the principles of Kernan and Barach.⁹
4. Fluids by mouth and parenterally to relieve dehydration and increase fluidity of secretion.
5. Moisture-saturated air by croup tent.
6. Tracheotomy or, rarely, intubation; not delayed if the foregoing procedures do not soon give relief.
7. Postural drainage and aspiration.
8. Postural irrigation if secretion, plugs or crusts cause blocking.
9. Bronchoscopic removal of crusts if necessary.
10. Expectorants (?).

Of the ten patients who required cannulation in my service at the Evanston Hospital, two died. The cases were favorable because they were usually referred early by alert pediatricians, whose collaboration in the general care was invaluable. Some of these patients were seen every few hours day and night for four or five days, and no cases are included from a service of a larger charity hospital where I could not be in frequent attendance. In all it appeared certain that tracheotomy

18. Nelson, H. P.: Postural Drainage of Lungs, *Brit. M. J.* 2: 251 (Aug. 11) 1934.

19. Aldrich, C. A.: Personal communication to the author.

20. Morlock, H. V.: *Lancet* 1: 381 (Feb. 13) 1937.

21. Hill, Leonard: Ciliary Movements in the Trachea, *Lancet* 2: 802 (Oct. 20) 1928.

22. Murphy, D. P.: Influence of Posture on Movement of Fluid in Trachea of Newborn, *Am. J. Obst. & Gynec.* 27: 118 (Jan.) 1934.

23. Stitt, H. L.: Bronchial Lavage for Disinfection and Immunization of the Bronchial Tree, *J. Med.* 14: 576 (Jan.) 1934.

24. Minter, M. M.: Technic of Bronchial Lavage, *South. M. J.* 28: 328 (April) 1935.

was inevitable. The two who died were seen only a few hours before death, and one had been given depressing doses of morphine. The series is too small, of course, for conclusions to be drawn, but it may indicate that with the measures here outlined the outlook in this disease is not too unfavorable.

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FAILURES IN THE TREATMENT OF URINARY TRACT INFECTIONS WITH SULFANILAMIDE

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Although introduced into clinical medicine less than five years ago, sulfanilamide has received abundant clinical trial. In adequate dosage the drug has already been proved to be most valuable in the treatment of infections caused by many organisms, especially the gonococcus and the beta hemolytic streptococcus. Why is it then that in some cases of such infections its use results in failure? Are the failures due primarily to resistance of individual strains of bacteria or are they due to some abnormality in the individual patient? Why are there such wide variations in the curative effects of sulfanilamide in cases of similar infections, perhaps even of the same strain?

In an attempt to answer these questions, we have undertaken the task of reviewing our failures in a fairly extensive use of sulfanilamide in urologic practice. In this study we include of course only infections ordinarily responsive to sulfanilamide and patients able to tolerate the drug in doses ordinarily effective and cooperative in other respects.

HOW DOES SULFANILAMIDE WORK?

The prompt control of many infections with sulfanilamide has aroused a decided revival of interests in chemotherapy and its mechanism. New concepts of man's fight against infection have arisen, and old ones are requiring many revisions. While there is still much to be learned about how this drug works, clinically sulfanilamide seems to produce three effects:

1. For certain organisms, notably the gonococcus, sulfanilamide has a definitely bactericidal effect in many cases.
2. Sometimes sulfanilamide merely limits the growth of the organism and does not eradicate it, the principal effect apparently being to prevent the extension of the infection to new regions.
3. Sometimes, however, sulfanilamide acts rather as an adjunct to the defensive mechanisms of the host.

It is not possible at this time to say definitely whether the effect of sulfanilamide is primarily on the susceptible organism or on the host's defensive mechanism. When sulfanilamide is diluted as much as it is in the blood stream, *in vitro* it appears to act as a bacteriostatic rather than as a bactericidal agent. The investigations of Long and Bliss¹ and others indicate that

sulfanilamide acts *in vivo* by bringing about a change in the susceptible micro-organisms which permits phagocytosis. However, we are convinced that sulfanilamide also at times has a direct action in the fight against the gonococcus. For a number of years we have treated early gonorrhea in the male by sealing a 5 per cent solution of mild silver protein in the anterior urethra once daily for three or four days. Before the days of sulfanilamide this treatment was successful in obtaining a quick cure in from 15 to 20 per cent of suitable cases. With this treatment supplemented with sulfanilamide, this figure has now increased to 95 per cent, as already reported.²

Before the advent of sulfanilamide patients with gonorrhea were instructed to take fluids freely. This advice has been changed and now they are instructed to drink sparingly so as to obtain a higher concentration of the drug in the urine. As first determined by Helmholtz³ and confirmed by Farrell, Lyman and Youman,⁴ when patients are taking sulfanilamide by mouth, sulfanilamide appears in the urine in sufficient concentration to be directly bactericidal. If the urethra is inflamed, patients are also instructed to void frequently in order to obtain the benefit of repeated flushing with urine containing sulfanilamide. This advice of course is reversed if toxic symptoms occur; then patients are urged to drink freely of water to hasten the elimination of the disturbing drug.

It should be noted that patients who discontinue the use of sulfanilamide too soon are apt to suffer a flare-up of the infection which often does not respond as well to a second course of sulfanilamide.

Numerous observers, however, have noted that better results were obtained in the treatment of gonorrhea when the use of sulfanilamide was started after the infection had been present for two weeks or longer.

Gaudin, Zide and Thompson⁵ have observed that new organisms added at the time of transurethral prostatectomy were not killed as well by sulfanilamide as were bacteria present in the urine before the operation. They, like many others in England and in Europe, think that sulfanilamide stimulates some mechanism closely related to natural immunologic defenses.

In the clinical use of sulfanilamide it was soon observed that patients taking it did not have the usual percentage of troublesome prostatic infections. The reason for this was later explained by the experimental work on dogs by Farrell, Lyman and Youman,⁴ who noted that sulfanilamide was eliminated in prostatic secretion in concentration high enough to be bactericidal.

Welsh, Wentworth and Mickle,⁶ in a recent study of the infection which causes undulant fever, observed that the serum of patients or animals infected with *Brucella* organisms, when treated with sulfanilamide, was active in stimulating phagocytosis even after all the sulfanilamide had been excreted. The opsonic power toward *Brucella* of the blood of uninfected human beings or guinea pigs was not stimulated by sulfanilamide, a fact

2. Ballenger, E. G.; Elder, O. F.; McDonald, H. P., and Coleman, R. C.: Sulfanilamide: I. General Discussion of the Drug; II. Sulfanilamide with the Sealing Treatment of Beginning Gonorrhea; III. Sulfanilamide in Combination with Artificial Fever, *South. Surgeon* 7: 204 (June) 1938.

3. Helmholtz, H. F.: Bactericidal Power of Urine after Administration of Prontylin by Mouth, *Proc. Staff Meet., Mayo Clin.* 12: 244-245 (April 21) 1937.

4. Farrell, J. I.; Lyman, Yale, and Youman, G. P.: Rationale of Sulfanilamide in Gonococcal Urethritis, *J. A. M. A.* 110: 1176-1177 (April 9) 1938.

5. Gaudin, H. J.; Zide, H. A., and Thompson, G. J.: Use of Sulfanilamide after Transurethral Prostatectomy, *J. A. M. A.* 110: 1887-1890 (June 4) 1938.

6. Welsh, Henry; Wentworth, J. A., and Mickle, F. L.: The Use of Sulfanilamide in the Diagnosis and Treatment of Brucellosis, *J. A. M. A.* 111: 226-231 (July 16) 1938.

Read before the Southwestern Branch of the American Urological Association at Dallas, Texas, Oct. 21, the New York Branch at New York, Nov. 10, and the Philadelphia Branch at Philadelphia, Nov. 28, 1938.
1. Bliss, Eleanor A., and Long, P. H.: Observations in the Mode of Action of Sulfanilamide, *J. A. M. A.* 109: 1524 (Nov. 6) 1937.

which indicates that an infective or immunizing process must be in progress for the drug to stimulate phagocytosis in this disease.

On the basis of experimental work, Mellon, Locke and their associates⁷ have concluded that the mechanism of the bacteriostatic action of sulfanilamide may be correlated tentatively with the host's resistance to infection. In numerous experiments they observed that "fitness" of the host is a prime factor in the eradication of the infection. When the temperature of rabbits is artificially lowered several degrees the animals exhibit great variations in the length of time required for their temperature to return to normal. This served as an index to "fitness," for those rabbits whose temperature returned to normal most quickly were most successful in combating pneumococci injected into the blood stream. They determined further that "fitness" may be increased by artificial fever, vitamin B₁, vitamin C, liver extract and adrenal cortex extract.

There appears then to be a relationship between the duration of the infection and the response to the sulfanilamide. While sulfanilamide is in some way effective in controlling the growth of many kinds of bacteria *in vivo*, it certainly involves other factors than the direct action of the drug on the bacteria.

SULFANILAMIDE WITH HYPERTYREXIA

Gonorrheal infections which were expected to yield to sulfanilamide but for some reason proved resistant without exception have been promptly benefited when the use of sulfanilamide was supplemented with artificial fever. We have also employed these two agencies simultaneously when for urgent business or domestic reasons an early cure of gonorrhea was essential. Patients whose physical condition was such that they could not be submitted to a major surgical operation with reasonable safety were regarded as unsuitable for artificial fever treatment. In suitable cases as a rule an oral temperature of 103 or 104 F. was maintained for three or four hours. When the pulse rate exceeded 140 the short wave current inducing the fever was discontinued regardless of the temperature obtained. These bouts of fever were given every other day until three or four had been administered. So used, artificial fever has proved safe and efficacious in reinforcing sulfanilamide therapy. It should be noted that in our work the patient's temperature is not carried to the thermal death point of the infecting micro-organisms and that the duration of the treatment is less than that usually recommended.

In our efforts to find other facts bearing on this subject, cultures of several types of organisms were subjected to (1) sulfanilamide alone, (2) heat alone and (3) the combination of these two remedies. The organisms employed in these tests were gonococci, streptococci, colon bacilli and staphylococci. There is, as is well known, a wide variation in the response of these organisms to germicidal agents and to heat. In our tests, however, the combination of the two agents was always more effective than either alone. This was found true whether the tests were carried merely to the point of bacteriostasis or to complete sterilization of cultures. While these tests *in vitro* showed that the combination was more efficacious than either alone, the results were never sufficiently good to explain the satisfactory clinical results with the combined treatment.

Why is this combination more effective than either agent employed alone? The answer seems to involve a number of factors: (1) those which concern the physiologic phenomena associated with the defense mechanism of the host, (2) those which concern the thermal sickening point or thermal death point of the infecting micro-organisms and (3) those which have to do with the concentration of sulfanilamide in the urine, blood stream, serum and tissues brought about by the profuse sweating incident to the artificial fever. In our investigations of this concentration we have noted in some instances that the level of sulfanilamide is increased in the blood as much as 25 per cent and in the urine from 35 to 50 per cent.

Our concept of the value of artificial fever has been supported in recent experimental work by Mellon.⁷ Commenting on the reinforcement value of artificial fever in the treatment of rabbits having blood stream infections with type I pneumococci, he said that the removal of these organisms from the blood stream "was effected more rapidly in the sulfanilamide rabbits than in the controls; more rapidly still in those given artificial fever and with maximum rapidity in the rabbits given both fever and sulfanilamide."

In the combined attack on the infection, artificial fever appears to act like a call to arms. Body tissues, serum and cells seem to be placed on a war time basis, with defensive agencies mobilized and activated. Or the chemical attack with sulfanilamide followed with hyperpyrexia may be likened to the gas barrage which handicaps soldiers so that they are more readily overcome by the bayonet charge.

PROTECTED FOCI, OR DEAD SPACES

While sulfanilamide in combination with hyperpyrexia has given us prompter and more satisfactory results than we have ever seen before, these combined measures failed to cause a cure in about one case in ten. In searching for the explanation of our failures, we noted that in such cases we were usually able to discover a protected focus or what, for lack of a better term, we call a dead space. Among important potential dead spaces may be mentioned para-urethral crypts, periurethral follicles, prostatic and other abscesses, seminal vesicles distended with stagnant secretions, areas of urethral strictures, residual urine in the renal pelvis and bladder, diverticula of the bladder, cavities surrounding calculi and foreign bodies, Skene's glands, Bartholin's glands, plugs of mucus in the uterine cervix, cervical crypts, areas of salpingitis, rectal or anal crypts, infected synovial fluid and regions from which lymphatic drainage is blocked. These dead spaces we are convinced usually are not reached by an adequate amount of blood laden with sulfanilamide and associated defensive agents manufactured by the host. They therefore continue to harbor the bacteria, though at times any of them may become free from infection without the application of special local measures.

In our use of sulfanilamide in combination with hyperpyrexia it gradually became evident that consistently good results could not be obtained unless pocketed infections, or dead spaces, were eliminated before curative bouts of fever were given or unless they received especial attention while the patient was in the fever cabinet. The eradication of such foci preparatory to the combination treatment often resulted in the clearing up of the infection without the use of fever therapy.

7. Mellon, R. R.; Gross, Paul, and Cooper, F. B.: *Sulfanilamide Therapy of Bacterial Infections with Special Reference to Diseases Caused by Hemolytic Streptococci, Pneumococci, Meningococci and Gonococci*, Springfield, Ill., Charles C. Thomas, Publishers, 1933.

For example, we may cite again "sealing treatment." Apparently the mild silver protein takes care of the dead spaces afforded by the mucus and secretion in the anterior part of the urethra and sulfanilamide kills or assists in killing the deeper infection if taken before the infection becomes protected in a pocketed area.

The eradication of dead spaces however, it should be emphasized, did not result in a cure by sulfanilamide when sulfanilamide was not adequate for the control of the major part of the infection. Such failures probably were due to the lack of an immunizing response on the part of the host.

The instances of protected foci of different types have convinced us that such dead spaces are prime factors in the resistance of gonococcal infections to sulfanilamide.

MEASURES FOR SPECIFIC FOCI

Of the methods of dealing with localized infections in dead spaces, perhaps the most valuable is the employment of local heat during the fever treatment as a supplementary measure. In the case of epididymitis this heat is applied to the epididymis; in the case of peritesticulitis, to the penis.

The acutely inflamed prostate, with perhaps multiple pocketed abscesses or cavities laden with stagnant secretion, unfortunately does not excrete sulfanilamide as does the normal gland. Therefore it not infrequently becomes desirable to treat such a prostate with local heat in addition to routine massage. In chronically infected seminal vesicles also stagnant secretion acts as a protected focus and should be emptied from time to time.

Protected foci not infrequently are associated with or caused by urethral strictures, which should be dilated.

Abscesses in any part of the genito-urinary tract require drainage and suitable treatment to prevent, if possible, the development of fistulous tracts. If a fistula already is present, it should be laid open or treated with a concentrated germicide.

Plugs of mucus in the uterine cervix may act as dead spaces. Adair and his co-workers have shown that this mucus contains very little sulfanilamide. For such areas there is need, therefore, for assisting measures. In the routine treatment of pelvic inflammatory disease we employ a prolonged hot douche of the Gellhorn type; this cannot, of course, be administered while the patient is in the fever cabinet. Vaginal bags of the Elliot or Mills type afford means of carrying heat to the cervix and pelvic organs during the period of hyperpyrexia. The heat from the vaginal bag causes an increase in the uterine and vaginal discharge. This secretion, fresh from blood and tissues bearing sulfanilamide, appears to be of distinct curative value. If such treatment is not effective, employment of the high frequency current or cautery may be required to eradicate endocervical foci.

Synovial fluid in inflamed joints should be aspirated. If it recurs, the effusion is then from serum and tissues containing sulfanilamide and the immunizing agencies stimulated by it. Inflamed joints require local heat in addition to sulfanilamide and fever therapy.

INFECTIONS OTHER THAN GONOCOCCIC AND TUBERCULOUS

Only a few remarks will be presented on the non-specific infections of the bladder and kidney. Here protected foci play an important part in preventing the

cure of ordinary genito-urinary infections. These dead spaces are different from those previously discussed; chronic and recurrent infections are practically always associated with obstructive lesions of the urethra, vesical neck or ureter. Control of the residual urine is the prime object whether the stagnating urine is in the bladder or the renal pelves. The constant contact of urine containing sulfanilamide with the lining of these cavities, however, often can overcome the infection in spite of the residual urine. This statement does not hold when calculi, retention catheters or other foreign bodies are present. Persisting infection or recurring infection always should arouse suspicion of the existence of obstruction, stones, diverticula or pocketed areas.

Sulfanilamide appears to control or to limit the infection associated with transurethral resection of obstructing prostates, but it usually does not clear the urine of infection until the healing is complete. Its use is not necessary or desirable during the entire convalescence or in large doses, but it may be employed intermittently and always cautiously, because elderly men with poor kidney function are likely to have toxic reactions. The fuzzy mucus-like coating over the resected area appears to act as a dead space. The same thing is true for the coating of ulcerating carcinomas of the bladder.

SUMMARY

We desire to emphasize again the importance of recognizing protected foci or dead spaces as chief causes of failure in the treatment of genito-urinary infections and to direct especial attention to the fact that a longer time, a higher degree of immunity or a greater concentration of therapeutic agents is required for the eradication of infection from such foci than for the eradication of infection not so protected.

Although sulfanilamide is a most efficacious drug, it is not one to be used indiscriminately or over prolonged periods without an effort to reinforce its use with supplementary measures or without a search for protected foci in need of special local treatment.

Our clinical experience has shown that hyperpyrexia is the most dependable agent with which to reinforce sulfanilamide in the treatment of resistant infections.

NOTE.—Since this paper was read, confirmation of our conclusions has been offered by J. S. Lockwood (Observations on the Mode of Action of Sulfanilamide and Its Application to Surgical Infections, *Ann. Surg.* **108**:801-812 [Nov.] 1938). Lockwood showed that even a small amount of peptone or of peptone-like products greatly retards the germicidal activity of sulfanilamide. As far back as 1911 Bainbridge had shown that some species of bacteria are unable to break down the protein molecule to obtain essential nitrogen. In consequence they starve to death in serum protein or egg albumin unless predigested protein in the form of peptone is supplied. Lockwood asserted that pus and tissue undergoing necrosis contain peptone-like products which prevent sulfanilamide from acting on the micro-organisms with the maximal effect that characterizes its effect on diffuse nonsuppurative infections. In a later paper (Studies on the Mechanism of the Action of Sulfanilamide, *THE JOURNAL*, Dec. 17, 1938, p. 2259) Lockwood and his associates stated that relapses "were frequent in patients with localized infections containing necrotic tissue, such as mastoiditis and abscesses, whereas in bacteremia and erysipelas they were not encountered." They asserted that "the presence of debris, human or bacterial, diminished the effectiveness of sulfanilamide on the hemolytic streptococcus."

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METABOLISM OF THE BRAIN DURING INSULIN AND METRAZOL TREAT- MENTS OF SCHIZOPHRENIA

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A previous communication¹ appearing in THE JOURNAL was concerned with the possible effects of insulin and metrazol in patients with schizophrenia. The conclusions were based on observations of animals, but methods were used which did not duplicate those employed in the treatment of schizophrenia. The present communication presents a brief summary of the chief results obtained in patients with schizophrenia undergoing the insulin and metrazol treatments. Since

TABLE 1—Average Oxygen and Dextrose Differences Between Arterial and Venous Cerebral Blood

Condition	Number of Observations	Oxygen, Vol per Cent	Dextrose, Mg per 100 Cc
Before injection of insulin	16	7.09	12.5
During hypoglycemic coma	26	3.07	4.16

these treatments change cerebral function, studies of cerebral metabolism were made.

The methods used for the study of the cerebral metabolism of the patients include the simultaneous collection of samples of arterial blood entering the brain and of the blood of the internal jugular vein, which represents the return flow from that organ. These samples are analyzed for oxygen and dextrose. The differences between the venous and arterial contents indicate the cerebral utilization of oxygen and dextrose.

Table 1 discloses the average differences of the oxygen and dextrose contents between arterial and venous samples before the injection of insulin and during the hypoglycemic coma. The utilization of oxygen is diminished during coma from 7.09 volumes per cent to 3.07 volumes per cent. Assuming a constant blood flow, this indicates a diminished metabolism of the brain of about 55 per cent. However in hypoglycemia, according to Loman and Myerson,³ the blood flow may be diminished, and the decrease of metabolism is therefore probably even greater than that indicated by the arterio-venous differences.

Thus the depressed cerebral metabolism and the coma are the direct results of the absence of carbohydrate, as the blood sugar diminishes in response to the injection of insulin. The brain, unlike other organs, oxidizes

practically only one foodstuff, carbohydrate,⁴ and as the available carbohydrate decreases the metabolism of the brain must necessarily diminish.⁵ It should be pointed out, however, that during hypoglycemia the brain does not suffer from lack of oxygen. On the contrary, the oxygen content of the brain may rise, owing to the diminished utilization of that gas.

On the other hand, anoxia is developed during convulsions induced with metrazol,⁶ for convulsions interfere with respiratory movements. Since it is physically impossible to draw blood from the internal jugular vein during the convulsions, only arterial samples were collected at this time. Table 2 discloses that during various stages of the convulsions the oxygen saturation of the hemoglobin of the arterial blood may decrease to 42 per cent, less than half the normal saturation of approximately 95 per cent. It is noteworthy that in these cases a moderate rise of blood sugar was noted after the initiation of the seizure. Even in the first moments after the convulsions are ended the oxygen saturation of the arterial blood does not attain normal values. Convulsions interfere temporarily with the oxygenation of the blood and therefore of the brain, thus diminishing cerebral metabolism. To contrast the fundamental differences of the actions of metrazol and insulin, the latter decreases the amount of coal (dextrose) necessary for the fire to support cerebral functions, while metrazol interferes with the draft (oxygen) required to maintain the flame. The end results, in regard to the supply of energy to the brain, are the same with the two methods.

Sakel⁷ has reported that if convulsions occur during insulin hypoglycemia a dramatic improvement of the patient may be observed. Because of this fact he considers it advantageous sometimes to provoke convulsions by the injection of metrazol during hypoglycemia. It is significant that anoxia is produced by convulsions.

TABLE 2—Percentage Hemoglobin Saturation of Arterial Blood During and Immediately After Metrazol Convulsions

Patient	Oxygen Content, Vol per Cent	Oxygen Capacity, Vol per Cent	Hemoglobin, per Cent	Blood Drawn in Relation to Duration of Seizure
WI	18.97	22.62	84	First half
WI	8.70	20.64	42	Late
WI	16.45	23.11	71	First half
R	14.07	22.74	62	Late
WI	12.17	22.69	49	Late
WI	15.23	22.71	67	Late
R	11.42	22.74	50	Late
N	21.37			After
WI	17.60	22.16	78	After
WI	15.97	20.58	77	After
M	16.93	21.99	74	After
Wn	20.43	22.71	90	After

irrespective of the level of the blood sugar. For example, with convulsions occurring in response to low blood sugar (11 mg per hundred cubic centimeters) an arterial hemoglobin saturation of 63 per cent was observed, while convulsions induced by metrazol during hypoglycemia resulted in a saturation of 61 per cent as blood sugar rose from 26 to 37 mg per hundred cubic centimeters.

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1 Gellhorn, Ernst. The Action of Hypoglycemia on the Central Nervous System and the Problem of Schizophrenia from the Physiologic Point of View, *J A M A* 110:1433 (April 30) 1938.

2 Dameshek, William, Myerson, Abraham and Stephenson, Caroline. Insulin Hypoglycemia: Mechanism of Neurologic Symptoms, *Arch Neurol & Psychiat* 33:1 (Jan) 1935. Himwich, H E., Bowman, K M., Wortis, Joseph, and Fazekas, J F. Brain Metabolism During the Hypoglycemic Treatment of Schizophrenia, *Science* 86:271-272 (Sept 17) 1937. *J Nerv & Ment Dis*, to be published.

3 Loman, Julius, and Myerson, Abraham. Studies in Dynamics of Human Craniovertebral Cavity, *Am J Psychiat* 92:791 (Jan) 1936.

4 Himwich, H E., and Naum, L H. Respiratory Quotient of the Brain, *Am J Physiol* 101:446 (Aug) 1932. Lennox, W G. Cerebral Circulation. Respiratory Quotient of the Brain and of Extremities in Man, *Arch Neurol & Psychiat* 26:719 (Oct) 1931.

5 Himwich, H E., and Fazekas, J F. The Effect of Hypoglycemia on the Metabolism of the Brain, *Endocrinology* 21:800-807 (Nov) 1932.

6 Himwich, H E., Bowman, K M., Fazekas, J F., and Ortengren, L O. Effect of Metrazol Convulsions on Brain Metabolism, *Proc. Soc. Exper. Biol. & Med* 37:359-361 (Nov) 1937.

7 Sakel, Manfred. The Pharmacological Shock Treatment of Schizophrenia, Nervous & Mental Disease Monograph Series, No 62 1933.

Thus convulsions occurring during hypoglycemia add to the effects of hypoglycemia those of anoxia and therefore involve both methods of diminishing the metabolism of the brain. This synergism permits the simultaneous utilization of the more prolonged action of insulin and the more severe one of metrazol. Though it is improbable that this diminished metabolism of the brain is the only factor involved, this review of the results obtained on patients with schizophrenia suggests that a depression of cerebral metabolism is associated with the initiation of the changes which lead to the amelioration of the disease. On this basis, patients with schizophrenia are now being treated with acute anoxia produced by the inhalation of nitrogen.⁸

Clinical Notes, Suggestions and New Instruments

VIRILISM IN WOMEN CAUSED BY ANDROGENIC THERAPY FOR MENSTRUAL DISTURBANCES

J. P. GREENHILL, M.D., AND S. C. FREED, M.D., CHICAGO

An interesting phase of the endocrine therapy of gynecologic conditions has recently arisen with the introduction of testosterone propionate, an androgenic substance, in the treatment of certain menstrual disorders. Desmarest and Capitain,¹ Loeser,² Foss³ and others have shown that this substance in doses varying from 400 to 2,000 mg. a month is capable of suppressing abnormal uterine bleeding. Loeser² has shown that at least 500 mg. of testosterone propionate must be given to suppress normal menstruation. It has also been reported that beneficial results may be obtained with smaller doses in cases of painful breasts and dysmenorrhea. The use of testosterone propionate in these conditions was suggested by its similarity in action to progesterone. In the rat and rabbit a progestational-like state of the endometrium was induced by administration of this substance. Furthermore, this androgen is capable of suppressing sex cycles of several species, inhibiting uterine contractions, neutralizing the action of estrogen on the vaginal mucosa and suppressing menstruation in monkeys and human beings, reactions which are typical of progesterone.

With the publication of the preliminary clinical reports on the use of testosterone propionate, a considerable wave of enthusiasm arose for the use of this substance in menstrual dysfunctions. The following report of two cases in which this substance was used is presented to deter physicians from the promiscuous use of androgenic therapy in females. The disagreeable side effects we have obtained with such therapy have definitely cooled our initial ardor, and, it is hoped, may serve as a warning to others.

REPORT OF CASES

CASE 1.—Mrs. A. F., aged 26, had been married six years and had never been pregnant. She consulted one of us (J. P. G.) Nov. 30, 1936, because of severe dysmenorrhea, which had been present since the onset of menstruation at the age of 13. This pain was so severe that the patient had to go to bed for two days every month. The monthly flow was profuse and at times alarming. After having tried numerous remedies the patient for a long time had used a combination of large doses of narcotics and a liberal quantity of whisky. The patient had had an appendectomy in 1935, and this failed to influence the menstrual pains.

Physical examination revealed that the head, neck, chest and abdomen were normal. Bimanual examination showed a

nulliparous outlet, a slightly eroded cervix, a small, hard, anteflexed and movable uterus and normal adnexa. The Rubin test revealed patent tubes. The basal metabolic rate was -14 per cent, and biopsy just before menstruation revealed the endometrium in the late secretory stage. Hence ovulation was present.

Dilation and curettage were performed in the hope of giving some relief from the dysmenorrhea. The endometrium showed normal secretory epithelium. During the next five months the patient was almost free from pain at the time of the menses. Then the pain returned and at the same time the flow of blood became more and more profuse. Furthermore the menstrual periods lasted from ten to thirteen days instead of four or five days. April 30, 1938, menstruation was so profuse that the patient had to be taken to a hospital. At this time the basal rate was again -14 per cent. Before and after this episode various forms of medication had been given in an attempt to control the menorrhagia. These included thyroid, anterior pituitary-like substance, snake venom, solution of posterior pituitary, ergonovine and solution of parathyroid and calcium. Repeated bimanual examinations during all this time failed to reveal any abnormalities.

In June it was decided to try large doses of estradiol benzoate. The patient was given 10,000 rat units twice during the first week following her menstrual period and 2,000 rat units twice during the second week. This medication had no effect on the following menstrual flow, which was as profuse and as painful as the previous ones. It was then decided to give the patient testosterone propionate. The menstrual period had begun July 13. The patient was given 50 mg. of testosterone propionate July 18 and July 19, 100 mg. July 20, 22, 25, 27 and 29 and August 1 and 2 and 50 mg. August 5, a total of 850 mg. in nineteen days. A vaginal smear and a biopsy specimen were taken August 8, two days before the menstrual period was expected. The vaginal smear showed a decrease in the number of cornified cells. The biopsy revealed that the endometrium was in the follicular phase, in spite of the fact that the menses were to occur two days later.

August 23 the patient complained of an acneform rash on the chest, a large amount of hair on the upper lip and increase in weight. The menses, which had been due August 10, did not begin until August 29, nineteen days later. This period was just as painful as before.

It was decided to give a second course of treatment with testosterone propionate. The patient was given 50 mg. September 9, 12, 14, 16, 19, 21, 23 and 26 and 25 mg. September 28 and 30, a total of 450 mg. in twenty-two days. September 30 the patient complained bitterly that the hairs on the upper lip were rapidly increasing in number, length and darkness and that considerable hair was growing on her arms and legs. Likewise her voice was husky and her friends had been asking her about this. The weight had increased 10 pounds (4.5 Kg.) in spite of attempts to diet rigidly. The acne reappeared and was present not only on the chest but on the back. There had been a definite decrease in the size of the breasts. October 10 examination showed a distinct enlargement of the clitoris. This organ was reddened, as was the skin immediately surrounding it.

Menstruation did not return until November 1, an interval of sixty-four days having elapsed since the previous menses (August 29). The menses were painless and the flow was slight. The patient stated that she felt better than she had for more than a year. However, she still has her excess weight, hirsutism, acne and deep voice. The basal metabolic rate November 15 was +3 per cent. Bimanual examination revealed nothing abnormal. However, the clitoris was definitely smaller and there was no redness on or around it.

CASE 2.—Mrs. S. H., aged 22, came to see one of us (J. P. G.) Nov. 11, 1936, for premarital examination and advice. The past history was irrelevant, and the only abnormality in the menstrual history was severe dysmenorrhea. Rectal examination revealed large hemorrhoids and a fibroid on the right side of the uterus, which measured approximately 5 cm. in diameter. April 2, 1937, a few months after marriage, the fibroid appeared to be about 6 or 7 cm. in diameter. A discussion was had concerning the advisability of removing the fibroid, both because of the possibility that it was causing the

8. Himwich, H. E.; Alexander, F. A. D., and Lipetz, Basile: Effect of Acute Anoxia Produced by Breathing Nitrogen, on the Course of Schizophrenia, *Proc. Soc. Exper. Biol. & Med.* 39:367 (Nov.) 1938.

1. Desmarest, E., and Capitain, Mme.: Testosterone Therapy of Mastopathies and Disturbances of Menstruation and Menopause, *Presse méd.* 45:777 (May 26), 1109 (July 28) 1937.

2. Loeser, A. A.: The Action of Testosterone Propionate on the Uterus and Breast, *Lancet* 1:373 (Feb. 12) 1938.

3. Foss, G. L.: Action of Testosterone Propionate on the Female, *Lancet* 1:992 (April 30) 1938.

severe dysmenorrhea and because it might be better to remove the mass before the patient became pregnant.

Because of the patient's youth and the desire to wait for children, nothing was done. In July 1938 it was decided to give testosterone propionate and note its effect on the fibroid and the dysmenorrhea. A biopsy revealed an early proliferative stage of the endometrium. The menses began August 7. The patient was given 50 mg. of testosterone propionate August 15, 17, 19, 22, 24, 26, 29 and 31, September 2, 7, 9, 12 and 14, 25 mg. on September 16, 19, 21, 23, 26 and 28 and October 3 and 7; a total of 850 mg. in fifty-three days. On August 26 a fibrous specimen was taken. This showed an early proliferative phase.

August 28, thirteen days after the administration of testosterone propionate was started, a menstrual period began, and the patient had no pain at all (after 300 mg. of testosterone propionate). This period started seven days early. However, this bleeding began two days after the biopsy specimen was taken and may not have been a menstrual period. August 29 the patient complained that she had gained 6 pounds (2.7 Kg.) (after 300 mg. of the substance). September 16, bimanual examination showed that the fibroid was distinctly smaller, only about 4 cm. in diameter (after 650 mg.). Another biopsy specimen obtained on this day showed an early proliferative phase of the endometrium. On September 19 the patient complained of an annoying acneiform eruption on her face and arms. The weight was still increasing in spite of strenuous dieting. Furthermore, the patient's husband had been noticing a steadily increasing hoarseness in the patient's voice for more than a week. This continued to increase in severity until the voice sounded almost like a man's, especially over the telephone. Another biopsy specimen taken October 12 showed the follicular phase of the endometrium. November 2 the patient complained not only of persistent huskiness of the voice, acne and increase in weight but also of an abundant growth of hair on the upper lip and on the chin.

Bimanual examination November 7 revealed that the fibroid had increased in size again, almost to the size it was before the testosterone propionate was administered. The menses did not return until November 18, eighty-two days after the last menses (August 28). The deep voice, excessive hair and overweight were still present, but the acne had cleared considerably. The menstrual pains were about 50 per cent less than usual, but the amount of blood lost was much greater than usual. Bimanual examination November 23 showed the same condition as on November 7.

COMMENT AND CONCLUSION

An analysis of these cases reveals that testosterone propionate in doses which are effective therapeutically is potent in the induction of a significant degree of virilism. Growth of hair on the face and body was stimulated and a lowering of the voice to a masculine pitch was obtained in both cases. Enlargement of the clitoris, however, was observed in only one. It was first expected that these masculine developments would regress soon after the cessation of injections. The clitoris in the one case has returned to normal, but the hirsutism and male voice have persisted to the present time, eight weeks after the last injection of testosterone propionate. It should be noted that menstruation has returned in both cases and the fibroid uterus regained its normal size in the one case, indicating that ovarian function has returned without the disappearance of the virilism. The possibility that these changes may eventually vanish is still present,^{3a} but it is significant that with the removal of the masculinizing ovarian tumor, the arrhenoblastoma, the masculine voice persists, indicating that a similar result might be expected, by analogy, with the masculine voice induced by administration of androgenic substances.

Other disagreeable reactions were acne and increase in weight. This tendency to gain weight has been noted frequently in male castrates treated with androgen by Kenyon.⁴ This

effect was noted in one of our patients in spite of an increase in the basal metabolic rate.

It is true that a certain therapeutic response was obtained. Intractable menorrhagia and dysmenorrhea were controlled in the first case, temporarily at least, by androgenic therapy. Dysmenorrhea associated with a fibroid of the uterus was checked in the second case in that the menses were inhibited. A definite decrease in the size of the fibroid was probably the result of the inhibition of ovarian function by androgen, similar to that noted in monkeys by Zuckerman⁵ and in rats by the work of the Mazers⁶ and by Freed, Greenhill and Soskin.⁷ This explanation is confirmed by the observation in endometrial biopsies that ovulation was prevented in both cases.

It is questionable, however, whether the beneficial results noted in our cases were worth the concomitant undesirable side reactions. Further observations are of course necessary to justify more definite conclusions. At present we are of the opinion that androgenic therapy in women should be approached with caution and is not to be recommended until the danger of virilism can be eliminated or controlled. It is not unlikely that an androgen or similar substance may be developed which will possess the desirable therapeutic effects of testosterone propionate without the harmful virilizing effects.

55 East Washington Street.

CHRONIC ULCER OF THE LEG ASSOCIATED WITH CONGENITAL HEMOLYTIC JAUNDICE

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Since the beginning of the century a considerable literature has accumulated concerning hemolytic jaundice. In 1900 Min-kowski and later Chauffard described the congenital type, and between 1907 and 1911 Hayem, Vidal and his associates presented a group which they considered to be "acquired." Attention was first called to the disease in this country by Tileston and Griffin¹ in 1910. Subsequently the excellent studies of Gänsslen,² Eppinger³ and Meulengracht⁴ completed the clinical picture of the disease as it is known today. Dawson⁵ and others have presented considerable evidence to show that the acquired and the congenital types are closely related and have cast considerable doubt as to whether any cases that rightfully belong to this group are actually "acquired." Haden's⁶ work demonstrated that the spherical microcyte is the fundamental variation from the normal in this disease and that "the anemia, jaundice, splenomegaly, reticulocytosis and increased fragility are all secondary to the globular form of the erythrocyte." An excellent summary of the clinical and laboratory appearances of the disease was given by the Cheney's⁷ in 1934.

Aside from the anemia, the commonest complication of the disease is probably gallstones, occurring in 68.6 per cent of the cases reported from the Mayo Clinic.⁸ Skeletal defects ("tower skull" of Gänsslen, and the like), joint pains and nosebleeds are also well known associated happenings. In the standard medical textbooks and in a number of the monographs no mention is made of chronic ulceration of the leg as a complication. Gänsslen² was one of the first to note this condition and its permanent regression obtained by splenectomy, although he disavows priority in calling attention to it.⁹

5. Zuckerman, Solly: Inhibition of Menstruation and Ovulation by Means of Testosterone Propionate, *Lancet* 2: 676 (Sept. 18) 1937.

6. Mazer, Milton, and Mazer, Charles: Effect of Prolonged Testosterone Propionate Administration on the Immature and Adult Female Rat, advance abstract in *Endocrinology* 23: 528 (Oct.) 1938.

7. Freed, S. C.; Greenhill, J. P., and Soskin, Samuel: Biphasic Effect of Testosterone Propionate on the Pituitary of Female Rats, *Proc. Soc. Exper. Biol. & Med.*, to be published.

From the Department of Surgery, Columbia University College of Physicians and Surgeons, and the Spleen Clinic, Presbyterian Hospital.

1. Tileston, Wilder, and Griffin, W. A.: *Am. J. M. Sc.* 139: 847-859, 1910.

2. Gänsslen, M.: Zipperlen, E., and Schütz, E.: *Deutsches Arch. f. klin. Med.* 146: 1-46 (Jan.) 1925.

3. Eppinger, Hans: *Klin. Wchnschr.* 9: 10 (Jan. 4) 1930.

4. Meulengracht, E.: *Der Chronische Hereditäre Hemolytische Ikterus*, Leipzig, Klinkhardt, 1922.

5. Dawson, B. E.: *Brit. M. J.* 1: 963 (June 6) 1931.

6. Haden, R. L.: *Am. J. M. Sc.* 188: 441-449 (Oct.) 1934.

7. Cheney, W. F., and Cheney, Garnett: *Am. J. M. Sc.* 187: 191-213 (Feb.) 1934.

8. Pemberton, J. de J.: *Ann. Surg.* 94: 755-765 (Oct.) 1931.

9. Gänsslen, M.: *Klin. Wchnschr.* 9: 1308 (July 12) 1930.

3a. In case 2 practically all the symptoms of virilism disappeared about January 10, three months after the last injection of testosterone propionate. In case 1 the huskiness and hirsutism are still present, almost four months after the last injection.

4. Kenyon, A. T.: Effect of Testosterone Propionate on the Genitalia, Prostate, Secondary Sex Characters, and Body Weight in Eunuchoidism, *Endocrinology* 23: 121 (Aug.) 1938.

REPORT OF CASE

The following case is of interest in this respect, and it will be noted that the presence of chronic ulceration of the leg was the patient's presenting symptom.

F. M. H., a woman aged 20, of German-American parentage, an unemployed stenographer, admitted to Vanderbilt Clinic June 29, 1937, complained of a chronic sore on the inner side of the left ankle of twelve months' duration. About one year before she had struck her ankle on a store counter. A bluish spot appeared, and three weeks later a "hole" developed. The lesion was quite painful and interfered with weight bearing but not with motion. She had been treated intermittently at several clinics with ultraviolet rays, boric acid ointment dressings and the like, with little or no progress. Examination of the lesion showed a shallow ulceration 1 by 2.5 cm just above and posterior to the internal malleolus. There was a moderate amount of yellow slough. A dusky cyanosis surrounded the ulcer for an area of 5 by 6 cm. An area 2 by 3 cm of this same dusky hue without ulceration was present in a similar location on the right ankle. X-ray examination of the ankle joint was negative. Aerobic and anaerobic cultures yielded only *Staphylococcus aureus*. The Wassermann reaction was negative. There was no history or clinical condition to suggest tuberculosis. An "elastoplast" bandage was applied, but irritation of the skin was so marked that it could not be tolerated. On her visit July 14 an icteric tint of the sclerae and skin was noted. Abdominal examination revealed the spleen palpable four finger-breadths beneath the left costal margin. Further history revealed that the patient's mother had been "yellow skinned and bruised easily." She was said to have died at 51 from "heart disease." The patient had been at another hospital three years previously because of pain in the left upper quadrant. The enlarged spleen was noted and removal was advised, but the patient refused operation. The patient was admitted to the Presbyterian Hospital July 18. Examination of the blood revealed hemoglobin 60 per cent, red blood cells 3,200,000, white blood cells 7,400, with platelets 317,000, reticulocytes 23.9 per cent, polymorphonuclear leukocytes 58 per cent (0-4-54), eosinophils 5 per cent, basophils 1 per cent, lymphocytes 32 per cent, monocytes 4 per cent, nucleated red cells 1/100, bleeding time two and one-half minutes, clotting time two minutes and forty-five seconds. The red blood cells showed marked anisocytosis

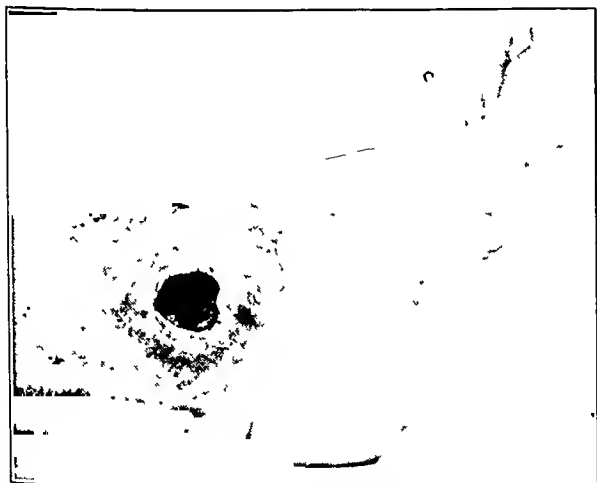


Fig. 1.—The shallow indolent ulcer before operation. Note the surrounding area of dusky cyanosis and pigmentation of the skin.

with a tendency to microcytosis, 19 per cent being the typical spherical microcytes of hemolytic jaundice. Fragility began at 0.625 per cent and was complete at 0.35 per cent. The range of the control was between 0.425 and 0.3 per cent, serum bilirubin 4.4, urine bile 0, urobilin positive. Figure 1 shows the ulcer of the leg July 21 before operation.

Splenectomy was performed by Dr. Louis M. Rousselot July 23. A thin walled gallbladder without stones was noted. The postoperative course was uneventful except for an unexplained

elevation of temperature on the third postoperative day. The pathologic examination of the spleen by Dr. V. K. Frantz revealed hemolytic jaundice. The spleen measured 19 by 14 by 8 cm. and weighed 760 Gm. A thin shiny capsule stripped easily. The cut surface was dark red and did not bulge beyond the capsule. The outstanding feature on section was the mass of closely packed red corpuscles throughout the pulp, even infiltrating into the malpighian bodies. The venous sinuses were



Fig. 2.—The site of the ulcer has remained healed nine months after operation but the pigmentation of the skin is still present.

large. There was no fibrosis. A few hemosiderin-laden phagocytes were noted. These observations correspond to those which Thompson¹⁰ has described as the typical and constant pathologic picture found in the spleen in true hemolytic jaundice.

The patient was discharged sixteen days after operation with the ulcer of the leg healed and with a firm abdominal wound. The blood examination revealed hemoglobin 83 per cent, red blood cells 4,000,000, white blood cells 5,400, platelets 189,000, reticulocytes 0.2 per cent, polymorphonuclear leukocytes 41 (0-1-40) per cent, eosinophils 4 per cent, basophils 2 per cent, lymphocytes 39 per cent, monocytes 4 per cent. The patient was last seen April 30, 1938, nine months after the operation, and stated that she had "never felt better" in her life. The ulcer has remained healed (fig. 2).

COMMENT

This is the first patient with this complication who has been seen in the Spleen Clinic at Presbyterian Hospital, where forty-three patients both with and without splenectomy have been carefully followed for a number of years. Undoubtedly, chronic ulceration of the leg is an infrequent finding in this disease, for Meulengraet in his careful study of thirty-four cases makes no mention of it.

In reviewing the literature at least seventeen similar cases¹¹ are found and recognition of this complication is made by a number of authors, particularly in Germany and the Scandinavian countries.¹² The large majority of the patients are young women in the second and third decades of life and give a history of having had persistent or recurrent ulceration of the lower leg for from two months to twenty years.

Treatment with ointments, wet dressings and bed rest for as long as two months is only rarely successful, and recurrence is the rule. Three of Eppinger's patients had persistent or

10. Thompson, W. P. *Bull. Johns Hopkins Hosp.* 51: 365-369 (Dec.) 1932.

11. Laux, F. J. *Klin. Wchnschr.* 10: 409 (Feb. 28) 1931. Dudley, G. S. *S. Clin. North America* 16: 839-842 (June) 1936. Smith, G. O. *Chronic Hereditary Hemolytic Jaundice*. J. A. M. A. 105: 1187-1188 (Oct. 12) 1935. Vaughn, Janet M. *The Anemias*, ed. 2, New York, Oxford University Press, 1936, p. 232. Gansslen² Eppinger,³ Dedichen¹¹ Poppe¹³ Seelig and Jaffé¹⁴.

12. Cowen, S. O. *M. J. Australia* 1: 265 (Feb. 22) 1936; 2: 545 (Nov. 11) 1922. Eppinger,³ Dedichen,¹¹ Poppe¹³ Laux¹¹ Cheney and Cheney.¹

recurring lesions of from seven to twenty years' duration. In a case¹³ in which splenectomy was refused, healing was reported after the patient was in bed three months with boric acid ointment dressings, but no follow-up is given.

In the twelve cases in which splenectomy was performed, all the resistant lesions healed in from eight to thirty days. One lesion¹⁴ recurred following direct trauma but healed promptly and showed no evidence of recurrence three and one-half years later.¹⁵ Another³ had some oozing with each menstrual period for a year and a half after the operation but it finally healed.

Splenectomy in this disease is now a relatively safe procedure. Large series of collected cases show a hospital mortality of but from 3 to 4 per cent.¹⁶

Even if operation appears to be mandatory during an acute crisis, the mortality is probably not appreciably higher in competent hands.¹⁷

The ulcers are almost always located in the region of the medial malleolus. There is usually only a single ulcer on the leg, but in about half of the cases there is bilateral involvement. Occasionally multiple ulcers are found in cases of long standing.¹⁴

Trauma may or may not precede the appearance of the ulcer. Frequently a dusky blue area in the region of the medial malleolus is the first manifestation of the impending ulceration. This breaks down in the center and a shallow indolent erosion appears, which advances to about 3 to 5 cm. in diameter. Larger punched out lesions appear only in the cases of very long standing. There is a moderate amount of yellowish slough. The edges are only slightly elevated and there is little undermining. A ring of the bluish cyanosis or dark pigmentation circumscribes the lesion. There is often considerable pain and, although limitation of motion is unusual, weight bearing may be considerably compromised.

Since Gänsslen's early report there has been considerable speculation as to the nature of the mechanism that causes these lesions to appear and as to why there is prompt permanent remission following splenectomy.

It has been suggested that the ulcers are just another of the congenital defects² associated with the disease. This is obviously inadequate, for all the other structural defects remain after clinical cure of the disease is accomplished by splenectomy. The possibility of an effect on the walls of the capillaries secondary to some of the abnormalities found in the chemical analysis of the blood has also been mentioned as predisposing to these ulcers. This seems unlikely, for at no time during the course of the disease can any increased capillary fragility be demonstrated.¹⁸ Similarly, the spherical microcyte itself cannot be considered a causative agent, for it persists following operation long after the lesions have healed.

At present there is no satisfactory explanation of this phenomenon. It is interesting to note that in sickle cell anemia, which has many points of similarity to congenital hemolytic jaundice, three out of four patients reaching adult life have ulceration of the leg.¹⁹ It would seem suggestive then that the causative agent will be found to be a factor common to the two diseases.

SUMMARY

Chronic ulceration of one or both medial malleolar regions occurs as a complication of congenital hemolytic jaundice. The lesions are highly resistant to all local therapy, but splenectomy affords a rapid, permanent cure.

Little recognition is accorded this complication, particularly in this country. It is undoubtedly an infrequent finding but may be the only manifestation of the disease that brings the patient to seek medical aid.

The presence of these ulcers is an added indication for splenectomy if they interfere with the patient's ability to work.

In the presence of apparently unexplained chronic ulceration of the leg, particularly in a young white woman, investigation of the morphology and fragility of the red cells should be made.

630 West 168th Street.

PRIMARY ADENOCARCINOMA OF THE JEJUNUM WITH PERFORATION

REPORT OF A CASE WITH SOME CLINICOPATHOLOGIC NOTATIONS

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Carcinoma of the jejunum, like carcinoma of the rest of the small intestine, is rare. Acute perforation of such a lesion is still more unusual. Carter¹ in 1935 mentioned that perforation of such a growth with peritonitis was recorded in only one case of laparotomy in the preceding eight years. No doubt he had reference to the case reported by Dencks,² which will be described later and which is the only instance of involvement similar to that to be reported that we have been able to find in the literature. The case here reported presented clinically the picture of perforated peptic ulcer.

REPORT OF CASE

History.—J. K., a white man aged 48, a laborer, admitted May 1, 1935, to the Cook County Hospital (surgical service of Dr. John Harger), was seized suddenly with severe pain in the abdomen twenty-two hours before admittance, while doing some repairs on a house. The pain was described as cramplike and more severe in the lower part of the abdomen. It was



Fig. 1.—Surgical specimen, showing broad perforation in the tumor of the jejunum.

of such intensity that he was forced to lie down immediately. After an hour it ceased and he resumed work. An hour later, however, the pains recurred, increasingly severe and constant. At 5 a. m. (seventeen hours after the onset) a physician advised hospitalization; at this time there was also pain referred to the right shoulder.

The past medical history was entirely irrelevant except for constipation. He took alcohol occasionally. There had been no selective dyspepsia, epigastric distress, loss of weight or vomiting.

On admission the temperature was 100.6 F. rectally, the pulse rate 102, the respiratory rate 36 and the blood pressure 132 systolic and 80 diastolic.

The essential physical pathologic changes were limited to the abdomen and consisted of diffuse boardlike rigidity, slight dis-

13. Seelig, S., and Jaffé, K.: *Klin. Wchnschr.* 9: 840 (May 3) 1930.
14. Dedichen, H. G.: *Acta med. Scandinav.* 77: 411-430, 1932.
15. Poppe, Erik: *Norsk mag. f. lægevidensk.* 95: 705 (June) 1934.
16. Eliason, E. L., and Johnson, Julian: *Surgery* 2: 823 (Dec.) 1937.
Thompson, W. P.: *Hemolytic Jaundice*, J. A. M. A. 107: 1776-1781 (Nov. 28) 1936.
Krumhaar, E. B.: *Am. J. M. Sc.* 166: 329-337 (Sept.) 1923.
Henfarth, H.: *Ergebn. d. Chir. u. Orthop.* 19: 285, 1926.
Pemberton, C.
17. Curtis, G. M.; Doan, C. A., and Wiseman, B. K.: *Ann. Surg.* 104: 892-904 (Nov.) 1936.
18. Elliot, R. H.: *The Suction Test for Capillary Resistance in Thrombocytopenic Purpura*, J. A. M. A. 110: 1177 (April 9) 1938.
19. Diggs, L. W., and Ching, F. L.: *South. M. J.* 27: 839 (Oct.) 1934.

Read before the Chicago Pathological Society, Dec. 12, 1938.
From the departments of Surgery and Pathology of the Cook County Hospital, Dr. Walter Schuller, director of laboratories.
1. Carter, R. Franklin: *Carcinoma of the Jejunum*, *Ann. Surg.* 102: 1019-1028 (Dec.) 1935.
2. Dencks: *Carcinoma jejuni mit Perforation*, *Med. Klin.* 23: 129 (Jan. 21) 1927.

tention and diffuse tenderness. Rebound tenderness was elicited in the left lower quadrant and on auscultation the peristaltic sounds were absent, but there was an occasional metallic click.

Fluoroscopic examination by Dr. R. T. Vaughan revealed free air under the right dome of the diaphragm. Examination of the urine gave negative results; the white blood cell count



Fig. 2.—Section taken near the perforation, under low power, showing invasion of the muscularis by the tumor glands. Hematoxylin and eosin stain.

was 7,800 per cubic millimeter. A preoperative diagnosis of perforated peptic ulcer was made.

Operation and Result.—Operation was performed (by E. A. C.) four hours after admission to the hospital and twenty-six hours after the onset of the initial pain. The abdomen was opened through a right paramedian epigastric incision. The intestinal loops were distended and a considerable amount of bile-stained seropurulent exudate was present. Examination of the stomach, duodenum, gallbladder and appendix, however, revealed no perforation. It was only after following the stream of exudate to its source below the transverse colon and omentum that the perforation was found in the jejunum. The perforation was fully 2 cm. in diameter and occupied the center of a firm constricting mass in this portion of bowel, 18 inches distal to the ligament of Treitz. Intestinal contents were escaping freely. The regional mesenteric lymph glands were enlarged and firm.

A diagnosis of probable carcinoma was made, and a wide resection of this area together with its mesentery was done. The continuity of the bowel was restored by an end to end anastomosis.

Course.—The patient did fairly well until the third postoperative day, when the wound began draining seropurulent material. The abdomen became distended and the peristaltic silence persisted. On the following day, four days after admission to the hospital and five days after onset, the patient died.

Surgical Pathologic Examination (Dr. J. D. Kirshbaum).—**Gross:** The specimen submitted consisted of a portion of jejunum 14 cm. in length, in the center of which was an ovoid defect measuring 3 by 1.5 cm. involving the entire thickness of the wall. The edges of the defect were firm, irregular and slightly rolled. The serosa was discolored purple-red, the mucosa was purple-tan and edematous (fig. 1).

Microscopic: Sections taken from the region of the tumor revealed a much thickened mucosa, heavily infiltrated with round cells and polymorphonuclear leukocytes. The crypts were lined by tall epithelium and in places were two and three layers thick. Their nuclei were irregular and hyperchromatic, atypical mitotic figures being frequently seen. In places the mucosa

was thrown into folds assuming a polypoid appearance. In one area the mucosa was missing and the floor of the defect was formed by the muscularis propria. Beginning at the surface there were dilated and elongated glandlike crypts lined by anaplastic tumor cells. They invaded the entire muscularis propria and extended to the serosa. There was no tendency to production of mucus. In the region of the intact mucosa the tumor glands were seen to extend radially. There were marked thickening in the subserosa distal to the tumor and dense infiltrations of round cells, plasma cells, large mononuclear cells and polymorphonuclear leukocytes (figs. 2 and 3). The diagnosis was adenocarcinoma of the jejunum with ulceration and perforation.

Necropsy.—This was performed six hours after death by Dr. B. Nieman. The essential pathologic observations were restricted to the abdomen. The intestinal loops were markedly distended by gas and were plastered together by loose fibrinous membranes. The serosa was dull and injected; the omentum was adherent to the anterior part of the abdominal wall. Examination of the entero-anastomosis with water revealed no defect in the line of suture. The mesenteric and periaortic lymph glands measured up to 25 mm. in diameter and on sectioning were yellow-gray. The lungs presented areas of focal pneumonia in both lower lobes.

Microscopic Examination of the Periaortic Lymph Node (Dr. Richard Jaffé) (fig. 4). The normal architecture of the lymph node was discernible only at the periphery. The greater portion of it was replaced by nests of glandular epithelium which resembled intestinal mucosa. The glands were round to oval and were lined by cuboidal to columnar cells. Their nuclei were anaplastic, occasional mitotic figures being seen. In between the tumor glands there was a moderate amount of cellular stroma.

The anatomic diagnosis was recent laparotomy wound for resection of a portion of the jejunum, diffuse fibrinoplastic peritonitis, pseudomembranous enteritis, end to end entero-

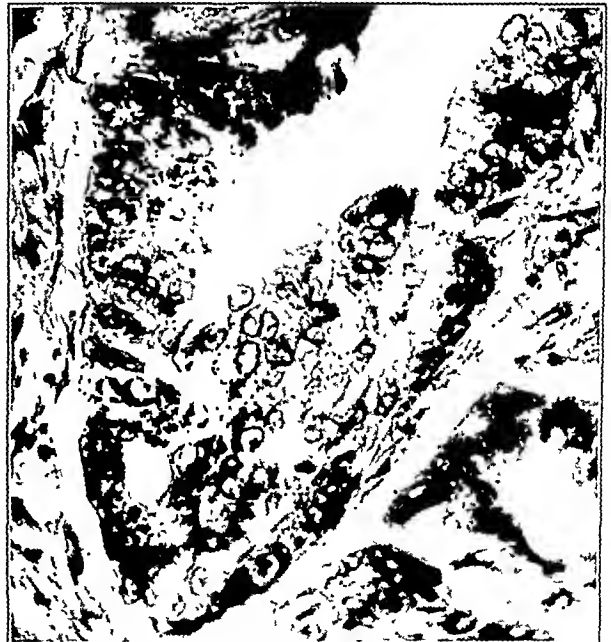


Fig. 3.—Section under high power showing tumor glands and mitotic figures. Hematoxylin and eosin stain.

anastomosis of the jejunum, metastases of adenocarcinoma to the mesenteric and periaortic lymph nodes and aspiration bronchopneumonia of both lower pulmonary lobes.

COMMENT

We have been able to find only one case of similar involvement in the literature, namely, that reported by Dencks,² of a 42 year old man who complained of sudden, severe abdominal pain two hours after the noon meal. A physician administered

morphine. On the following day the patient was admitted to the hospital with symptoms of perforative peritonitis of about ten hours' duration. A laparotomy was performed immediately and a small annular stenosing tumor was found with a perforation at the mesenteric border. A wide resection of this area with an end to end anastomosis was performed and the patient made an uneventful recovery. Histologically the tumor proved to be a cylindric cell carcinoma of glandular type.

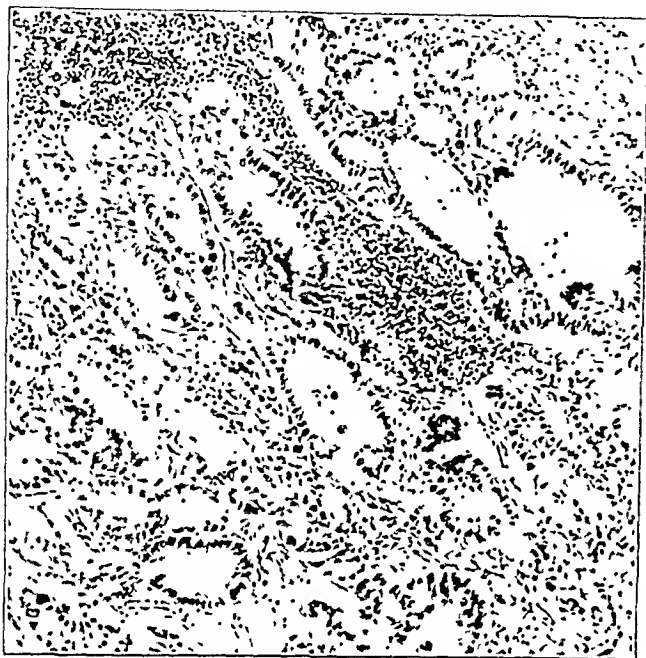


Fig. 4.—Section under low power from one of the periaortic lymph nodes, showing metastasis. Hematoxylin and eosin stain

Keyser³ in 1908 reported jejunal carcinoma with fatal perforative peritonitis in a patient in whom a previous exploratory laparotomy had shown an inoperable tumor.

From the statistical study given in the table it will be seen that carcinoma of the small bowel is relatively rare and occurs with least frequency in the jejunum. Because of this rarity there is some discrepancy in the reported incidence of carcinoma of the small intestine from the various clinics. Ewing⁴ stated that carcinoma of the small bowel forms 3 per cent of all intestinal carcinomas. Mayo and Nattrour,⁵ in reviewing seventy-six cases of carcinoma of the small intestine observed at the Mayo Clinic in the ten years prior to 1936, found that carcinoma of the small bowel comprised 0.62 per cent of all the carcinomas from the cardiac end of the stomach down to and including the rectum, and that carcinoma of the jejunum formed only 0.15 per cent of all the carcinomas of the gastrointestinal tract.

A review of 10,309 necropsies performed at the Cook County Hospital during the nine years from 1929 to 1938 showed seven cases of carcinoma of the small intestine, three of the duodenum and four of the jejunum, compared to 273 cases of carcinoma of the stomach and 163 cases of carcinoma of the colon and rectum—a frequency of 1.6 per cent for carcinoma of the small bowel and 0.9 per cent for jejunal carcinoma among carcinomas of the gastrointestinal tract.

Many theories have been proposed for the relative infrequency of carcinoma of the small intestine, among which may be mentioned the embryonic rest theory of Cohnheim. Other authors have attributed the low incidence to the absence of abrupt bends and irritation such as is seen in the sigmoid colon, the rectum, the hepatic and splenic flexures and the cecum. Carcinoma of the intestinal tract is found at points where there is an abrupt change in the lining epithelium of the canal, e. g. at

the junction of the esophagus and the stomach or at the anus and rectum. These abrupt changes are absent in the small intestine. Rankin and Mayo⁶ subscribe to the theory that the fluid nature and the alkaline reaction of the contents of the small intestine may explain the lowered incidence of carcinoma of the small bowel.

Whereas the average age in cases of carcinoma of the jejunum was found by Rankin and Mayo⁶ to be 47.5 years, this was later revised by Mayo and Nattrour to 51 years. Keyser reported the average age to be 43.9 years. Raiford⁷ found 52 as the average age. In four necropsy records of carcinoma of the jejunum from the Cook County Hospital the average age was 47.5 years. The sexes were equally represented.

From a review of the clinical histories in the cases reported, it is apparent that in the majority there were symptoms of acute and chronic intestinal obstruction. Our case differed from these in that the first clinical manifestation was acute perforative peritonitis, which clinically closely resembled that seen in perforation of a peptic ulcer. In an extensive review of the causes of spontaneous pneumoperitoneum by Vaughan and Singer⁸ in 1929, two pathologic entities were strongly emphasized, namely perforation of a peptic ulcer and perforation of a gastric carcinoma. Although the lesion in our case was in the jejunum, at the onset it was impossible to differentiate it fluoroscopically from the more frequent perforation of stomach or duodenum. The great rarity of perforation of carcinoma of the jejunum precludes its preoperative diagnosis even in the presence of acute abdominal symptoms if there is no previous history or roentgenologic evidence of a lesion of the small intestine.

The cardinal features in the clinical picture of carcinoma of the small intestine are as a rule those of chronic intestinal obstruction associated with moderate anemia, melena and loss of weight. The absence of these symptoms in our case and the picture of acute perforation of a hollow viscus precluded its preoperative diagnosis.

Whereas in primary carcinoma of the jejunum extensive metastases to the lungs have been recorded by Malerich⁹ and to the liver by Milles,¹⁰ in our case they were limited to the radix of the mesentery and the regional lymph nodes.

SUMMARY

A case of primary adenocarcinoma of the jejunum with acute perforative peritonitis was observed in a white man aged 48.

Autopsy Statistics

Years	Source	No. of Autopsies	Carcinoma of				Un- deter- mined
			Small Intes- tine	Jeju- num	Ileum	Duode- num	
1870- 1893	Vienna General Hos- pital*	41,838	17	0	10	7	0
1886- 1891	Pathologic Institute of Berne*	5,621	9	0	3	6	0
	Zeman*	21,621	9	0	6	3	0
To 1932	Johns Hopkins Hos- pital ⁷	11,500	16	4	3	7	2
1929 1933	Cook County Hos- pital	10,309	7	4	0	3	0
Totals.....		90,892	58	8	22	26	2

* Cited by Hermann Nothnagel (*Diseases of the Intestines and Peritoneum*, in Nothnagel's *Encyclopedia of Practical Medicine*, Philadelphia, W. B. Saunders Company, 1904, vol. 8, pp. 402-404).

In a review of 10,309 necropsies performed at the Cook County Hospital four cases of primary carcinoma of the jejunum were found, one of perforation.

6. Rankin, Fred W., and Mayo, Charles, Jr.: Carcinoma of the Small Bowel, *Surg., Gynec. & Obst.* 50: 939-947 (June) 1930.

7. Raiford, Theodore S.: Tumors of the Small Intestine, *Arch. Surg.* 25: 122-177 (July) 1932.

8. Vaughan, Roger T., and Singer, Harry A.: The Value of Radiology in the Diagnosis of Perforated Peptic Ulcer, *Surg., Gynec. & Obst.* 43: 593-597 (Nov.) 1929.

9. Malerich, J. A.: Primary Carcinoma of the Jejunum with Metastasis to the Lung: Report of a Case, *Proc. Staff Meet., Mayo Clin.* 9: 40-42 (Jan. 17) 1934.

10. Milles, George: Carcinoma of the Jejunum, *Tr. Chicago Path. Soc.* 13: 451-452 (June) 1931.

3. Keyser, C. R.: Carcinoma of the Jejunum, *Lancet* 2: 304-306 (Aug.) 1908.

4. Ewing, James: *Neoplastic Diseases: A Treatise on Tumors*, ed. 2, Philadelphia, W. B. Saunders Company, 1922, p. 661.

5. Mayo, Charles W., and Nattrour, Walter S.: Carcinoma of the Jejunum, *Surg., Gynec. & Obst.* 65: 303-309 (Sept.) 1937.

Clinically the picture was that of an acute perforation of a hollow abdominal viscus, as evidenced by sudden abdominal pain, rigidity of the abdomen and the presence of free air beneath the diaphragm.

The condition was clinically indistinguishable from the more common type of perforation, namely perforated peptic ulcer and perforated gastric carcinoma.

In the majority of cases of carcinoma of the jejunum symptoms of intestinal obstruction are associated with melena, moderate anemia and loss of weight. These symptoms were absent in our case.

From a review of the literature it is evident that carcinoma of the jejunum is rare, having an incidence of 0.9 to 0.15 per cent among all the carcinomas of the gastrointestinal tract.

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TUMOR OF THE SPINAL CORD COMPLICATING TABES DORSALIS

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When a patient has a chronic syphilitic condition of the spinal cord and a second and unrelated lesion of the spinal cord develops, the latter may escape detection. The case reported here appears to be the first recorded instance of the diagnosis and successful removal of a glioma of the cauda equina from a patient who had been known to have tabes for some years.

REPORT OF CASE

A married man, aged 48, was referred to the Mayo Clinic in January 1938 with a diagnosis of tabes dorsalis. In 1905 he had had a chancre and had received injections of mercury. In 1920, when he had complained of headaches and diplopia, a physician had discovered that deep reflexes of the lower extremities were absent and that Argyll Robertson pupils were present. The Wassermann reaction of the blood was positive. Eighteen injections of nearsphenamine reversed this reaction. Several years later, typical tabetic lancinating and spot pains had appeared in the lower extremities and had continued to occur in spells several times each month until 1937; in that year none had been experienced.

Gradual decrease in both libido and potentia had begun in 1930 and both had been absent by 1933. In 1936 the patient had noted absence of the normal sensation of fullness of the bladder and difficulty in emptying it. With time, rectal function had become similarly impaired. In May 1936 spinal puncture had been performed. The cerebrospinal fluid obtained was xanthochromic and contained an excess of protein and 10 cells per cubic millimeter. Intensive therapy with nearsphenamine, bismuth compounds and tryparsamide was begun. However, the patient's symptoms had progressed, weakness and incoordination of the lower extremities becoming the most distressing symptoms. The patient finally had been reduced to getting about with a cane and had been forced to resign his employment. Spinal puncture again revealed a yellow fluid and led to the patient's being sent to the clinic.

The pupils were small, unequal and irregular. They reacted in accommodation but not to light (Argyll Robertson pupil). Power of the hamstring muscles of both thighs was reduced and that of the muscles of both legs and feet was markedly impaired. Deep reflexes of the upper extremities were normal but those of the lower extremities were absent. Abdominal reflexes could not be obtained. Signs indicative of injury to the pyramidal tract were not elicited. Romberg's test gave a positive result. The anal sphincter was atonic.

Sensibility to painful stimuli was markedly diminished over the whole of both lower extremities and, to a less extent, in a patchy fashion over the trunk. Testicular pressure was not painful. An exact "sensory level" could not be demonstrated. Sensibility to touch and temperature were only slightly

impaired. Vibratory sense was well preserved but joint sense was seriously impaired in both feet. Tests of coordination were poorly performed with the lower extremities and the patient exhibited a steppage type of gait.

Routine laboratory tests of blood and urine all gave results within normal limits. Roentgenograms of the thorax and of the entire spinal column disclosed no abnormality aside from a narrow lumbosacral joint space. On spinal puncture, however, fluid could not be obtained at the third lumbar interspace; that is, at the interspace below the third lumbar vertebra. At the fourth lumbar interspace a deeply xanthochromic fluid was obtained, in which a pellicle formed spontaneously. The fluid contained 4,000 mg. of total protein per hundred cubic centimeters and 3 small lymphocytes per cubic millimeter; the result of the Nonne test was strongly positive and the Kolmer-Wassermann and Kline tests gave negative results. The Queckenstedt test (bilateral jugular compression) demonstrated almost complete block in the spinal subarachnoid space above the fourth lumbar interspace. In order to localize the obstructing lesion further, additional spinal punctures were performed at successively higher levels. At the twelfth thoracic interspace, fluid could not be obtained. However, at the tenth thoracic level the spinal fluid was only faintly yellow and the Queckenstedt test gave no evidence of block.

Because it was believed that the obstruction probably was caused by a benign neoplasm involving the spinal cord and that it was not of syphilitic etiology, laminectomy was performed by one of us (J. G. L.) Feb. 7, 1938. When the laminae of the third lumbar vertebra were removed, the underlying dura mater was found not to pulsate. The dura mater was opened, exposing a tumor which appeared to fill the caudal dural sac. The laminectomy was extended in both directions until the entire mass could be seen. It extended from the lower border of the twelfth thoracic vertebra to the fourth lumbar vertebra. It was possible to remove the tumor in one piece after severing its connection with the filum terminale below and the conus medullaris above. It appeared to have taken origin from the tip of the conus and it was necessary to sacrifice the distal segment of the conus in removing the tumor. Once the tumor had been removed the fibers of the cauda equina came into view, as they had been displaced anteriorly. On microscopic study Dr. J. W. Kernohan identified the tumor as an ependymoma.

The patient left the hospital on the seventeenth postoperative day, at which time sensation and power in his lower extremities had improved; catheterization was still necessary. Three months after operation the patient reported that his gait was normal and that his legs were of normal strength. He no longer noted sensory impairment of his feet. It was still necessary at times for him to catheterize himself.

COMMENT

To determine when the tumor first produced symptoms is difficult. Probably the alterations in sexual and sphincteric function which began in 1930 were results of growth of the tumor, although the syphilitic lesion may have played some role in their production. Although pain in the lower part of the back and in the distribution of the sciatic nerves almost always is present in cases of tumor of the cauda equina, and is the initial symptom in 80 per cent of cases,¹ such pain was absent in this case, probably because of the preexisting tabetic lesions of the sensory conducting pathways of the spinal cord. The lancinating and spot pains which the patient had experienced for a number of years were typical of tabes and did not suggest the root pains of a spinal cord tumor. Furthermore, these pains had been absent during the year before the patient came to the clinic.

The physical and neurologic examinations gave rather typical signs of advanced tabes dorsalis except that the muscular weakness of the lower extremities was greater than might be attributed to the hypotonia and ataxia of tabes dorsalis. Muscular weakness per se is rarely a prominent symptom of tabes dorsalis.

1. Kernohan, J. W.; Woltman, H. W., and Adson, A. W.: Glioma Arising from the Region of the Cauda Equina: Clinical, Surgical and Histologic Considerations, *Arch. Neurol. & Psychiat.* 20: 287-305 (Feb.) 1933.

The first real suspicion of the presence of a complicating lesion arose when lumbar puncture disclosed complete block of the spinal subarachnoid space and a deeply xanthochromic cerebrospinal fluid. The protein content was unusually high (4,000 mg.). The cell count of the fluid was normal and serologic tests gave negative results.

Such conditions do not occur in uncomplicated *tabes dorsalis*. Xanthochromic cerebrospinal fluid had been recorded in a variety of syphilitic lesions of the spinal cord, such as acute syphilitic meningitis, thrombosis of the spinal arteries and syphilitic meningomyelitis.² However, in none of these is the protein content excessive nor is subarachnoid block present. There is another group of syphilitic lesions of the spinal cord, however, in which the classic Froin syndrome may occur, namely a xanthochromic fluid which contains an excess of globulin and lymphocytes and which clots spontaneously on standing. Such lesions are pachymeningitis hypertrophica, chronic syphilitic leptomeningitis and gumma of the spinal meninges or cord. Recently these have been grouped together as "syphilitic pseudo tumors" by Hagenau and Lichtwitz,³ who emphasized that pleocytosis of some degree is a constant finding in these cases and that the spinal fluid nearly always gives a positive Wassermann reaction. Thus the cerebrospinal fluid in our case was not typical of any definite syphilitic syndrome but, rather, was typical of a neoplasm of the spinal cord, producing complete obstruction of the spinal subarachnoid space.

Furthermore, our inability to obtain cerebrospinal fluid at the third lumbar interspace suggested that a local rather than a diffuse obstructing lesion was present and prompted the use of multiple punctures⁴ by means of which the extent of the lesion was determined. This method not only gave more information than would injection of a radiopaque oil below or above the lesion but it also avoided any possible aggravation of an inflammatory process.

TORSION OF THE GALLBLADDER

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Torsion of the gallbladder is such a rare condition that of the few cases reported only four occurred in this country. Shipley,¹ in a thorough search of the literature, was able to find twenty-one cases, most of which were reported in the English and German literature.

Before reporting these cases I shall state briefly the five possible anatomic arrangements and positions of the gallbladder:

1. The gallbladder may be embedded in the liver tissue.
2. It may be closely attached to the under surface of the liver with no intervening layer of connective tissue.
3. The outer end of the fundus may be surrounded by peritoneum and the rest attached to the liver, but not actually touching it, because of an interposed layer of fibrous tissue. This is the normal anatomic arrangement.
4. The gallbladder may be completely surrounded by peritoneum and lie free in the abdomen except for its attachment to the cystic duct. This is not a common occurrence. If it were not for the unfortunate case with which these gallbladders become twisted, this anatomic arrangement would be generally accepted as an ideal one from the point of view of the surgeon. All that is necessary in doing a cholecystectomy on such a gallbladder is to ligate the cystic artery and the cystic duct and remove the organ.
5. The gallbladder may be completely surrounded with peritoneum and attached to the liver by a mesentery.

The cases I am reporting here illustrate the last two groups:

CASE 1.—An unmarried woman aged 54, while riding over an unusually rough road August 31, was suddenly seized with excruciating pain in the upper right quadrant. The pain at first localized in the region of the ninth costal cartilage and later became more or less generalized over the entire right side. The

pain was soon followed by nausea and vomiting. These three symptoms, being the only ones she presented, became worse until the time of operation September 1, thirty-six hours after their first appearance. She was seen three hours after the onset by her family physician, who made a diagnosis of indigestion and gave her one-fourth grain (0.016 Gm.) of morphine sulfate with no relief of pain. When I saw her thirty hours later she appeared to be very sick and in acute pain. The temperature was 100 F. by mouth and the pulse rate was 95.

Her past history was entirely negative except for constipation and belching of gas. Physical examination revealed that the patient was poorly nourished with scoliosis, the concavity of which pointed to the right side. This deformity brought the right costal cartilage unusually near the crest of the ilium. There was no jaundice. Examination of the head, neck, eyes, mouth, throat, heart and lungs gave essentially negative results, except for the fact that her respirations were almost entirely thoracic and that the abdomen did not move, even on deep inspiration. The abdomen was not distended and there was no visible peristalsis. Palpation of the abdomen failed to reveal any palpable masses but did reveal a very definite rigidity of the entire right side with a maximum point of tenderness just to the right of the umbilicus. This point later proved to be the location of the gallbladder. A diagnosis of either acute cholecystitis or acute appendicitis was made, and the patient was taken to the hospital for operation. The blood count revealed 20,500 leukocytes with 80 per cent polymorphonuclears. The urine was normal except for a trace of albumin with a few pus cells.

On opening the peritoneal cavity I found no trace of free fluid, which is often present in these cases. The gallbladder was first examined and found to be lying a short distance from the under surface of the liver with the fundus pointing downward and backward. The entire organ was completely surrounded with peritoneum. It was tense and its walls were a reddish brown. It was twisted one and one-half times from left to right and, when untwisted, emptied freely. The cystic duct had a short mesenteric attachment to the liver in which lay the blood vessels. Thus the cystic duct acted as a central point about which the gallbladder could rotate at will. A cholecystectomy was performed by ligating the cystic artery and cystic duct and removing the gallbladder. The appendix was next visualized and its vessels were injected. The lumen contained two fecaliths. An appendectomy was performed and the abdomen closed in layers. Recovery was uneventful except for the fact that a stitch abscess developed on the tenth day.

The pathologic examination revealed the gallbladder 8 by 4.5 cm. in diameter, reddish brown and filled with thick, dark brown fluid. The mucous membrane was swollen and congested. There were no calculi. The wall of the gallbladder contained several small hemorrhagic areas.

CASE 2.—An Italian woman, aged 23, married, came to St. Luke's dispensary with a history of attacks of pain in the epigastrium. The pain was colicky and radiated through to the right shoulder. This was followed by nausea and vomiting. She had had several such attacks in the last four years. Her past history was otherwise irrelevant. A roentgenogram showed a nonfunctioning gallbladder. She was admitted to the surgical service and a cholecystectomy was done. The gallbladder was completely surrounded with peritoneum and attached to the under surface of the liver by a mesentery. It contained several small stones. A cholecystectomy was done by simply clamping and ligating the mesentery and likewise the cystic duct.

This case represents the fifth anatomic group.

From a clinical point of view there are two types of torsion of the gallbladder, namely complete and incomplete. In complete torsion there is strangulation of the blood supply and gangrene of the gallbladder. The symptoms are acute, beginning with dramatic suddenness. In incomplete torsion there is interference with drainage of the gallbladder. The symptoms are insidious in onset and resemble those of chronic cholecystitis.

It was interesting to note that nineteen of the twenty-one cases reported occurred in women, all but two over 50 years of age and the majority over 70. Gallstones were present in only six instances. The direction of the volvulus is not a matter of significance, since seven were clockwise, five were

2. Merritt, H. H., and Fremont-Smith, Frank: *The Cerebrospinal Fluid*, Philadelphia, W. B. Saunders Company, 1937.

3. Hagenau, J., and Lichtwitz, A.: *La syphilis pseudo-tumorale de la moelle*, *Ann. de méd.* 27: 268-288 (March) 1930.

4. Elsberg, C. A., and Cramer, Fritz: *Multiple Spinal Punctures: Their Value for Localization and Diagnosis of Tumor of Cauda Equina*, *Arch. Neurol. & Psychiat.* 23: 775-783 (April) 1930.

From the Surgical Service of St. Luke's Hospital.
1. Shipley, A. M.: *Torsion of the Gallbladder*, *Arch. Surg.* 14: 968 (May) 1927.

counterclockwise and the direction of the rest was not mentioned. Three patients died; a fourth case was discovered at autopsy. It was discovered in one case that the common duct was evidently drawn up by the twisting of the cystic duct and ligated. This patient became deeply jaundiced and died twelve days later. Only one case was diagnosed properly; the other cases were diagnosed practically everything concerned with the abdomen from indigestion, as in this case, to twisted ovarian cyst, cholecystitis being the most frequent diagnosis.

In the majority of cases the onset was very sudden and in only one case was there a previous history of discomfort in the upper quadrant of the abdomen. The clinical picture is so definite that, according to Lett,² pain in the upper right quadrant of the abdomen beginning with dramatic suddenness, followed by nausea and vomiting, with very slight elevation of temperature, a moderate increase in the pulse rate, occurring with or without a palpable mass in a woman over 65 with no previous history of gallstones, should always make one suspicious of torsion of the gallbladder. However, the condition is so very uncommon that its likelihood of being present is usually not considered.

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Special Articles

THE PHARMACOPEIA AND THE PHYSICIAN

IMMUNOLOGIC METHODS IN PEDIATRICS

ARCHIBALD L. HOYNE, M.D.
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This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopoeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Susceptibility of the individual is a necessary factor when considering the application of an immunizing agent. In many instances age exerts a controlling influence on susceptibility. It is well known that smallpox, erysipelas, whooping cough and chickenpox may occur in very early infancy. Any of these diseases may be encountered during the first few weeks of life; smallpox and erysipelas may develop soon after birth. Various forms of meningitis also occur very early. Diphtheria and scarlet fever are not common before 1 year of age and are rare under 6 months; the same holds true for poliomyelitis. Measles is very infrequent prior to the first half year of life.

PROCEDURES FOR ACTIVE IMMUNITY AGAINST SOME OF THE MORE COMMON INFECTIOUS DISEASES

In view of the foregoing facts, vaccination against smallpox should be the first protective measure to be adopted in the life of the child to afford artificial immunity. If the infant is in good health and without any cutaneous disorder such as eczema, from the third to the fourth month offers a good time for this procedure. In the presence of known exposure to smallpox there is no contraindication to vaccination. If possible it is preferable to choose cool weather for the inoculation, when there is less likelihood of secondary infection. The multiple pressure method is superior to all others. Failure to secure a successful vaccination in an unvaccinated individual should never be construed

as an indication of immunity. This statement is based on the assumption that the patient has not had smallpox.

Next in order, immunization against whooping cough may be undertaken. For this purpose Sauer's vaccine is injected subcutaneously. It is given at weekly intervals, two injections each time in doses of 1 cc., 1.5 cc. and 1.5 cc., making a total of 8 cc. or about 80 billion bacteria. It requires about four months for immunity to develop. Therefore if inoculations are made at 3 months of age the baby cannot be assumed to have protection from whooping cough before it is 7 months old.

Diphtheria immunization can be instituted at 9 months. This is best accomplished by the subcutaneous injection of three doses of toxoid or two doses of alum precipitated toxoid. In either instance the dose is 1 cc. with an interval of from three to four weeks between injections. In many cities of the United States only one dose of alum precipitated toxoid is employed. It is presumed that the antigenic response is sustained over a more prolonged period with the latter preparation than when plain toxoid is used. However, although immunity with alum precipitated toxoid may be established within two months, it does not last for more than two years in about 50 per cent of cases. It is well to perform a Schick test six months after administration of toxoid to determine its success.

Ramon, who introduced toxoid for diphtheria immunization, now strongly recommends that tetanus toxoid be administered in combination with the diphtheria toxoid. His method consists of injecting subcutaneously 2 cc. of the combined toxoids on three occasions at intervals of three weeks. This plan seems very desirable and will undoubtedly be given wider acceptance in the future.

The Dick method for active immunization against scarlet fever has not received the general approval of pediatricians. Fear of severe reactions, the multiplicity (five) of injections and the belief that immunity to hemolytic streptococcus infections is not assured deter many from adopting the method. Nevertheless in hospitals and institutions where large numbers of children are housed the procedure is of undoubted value. Robinson¹ has reported favorable results with intracutaneous injections of scarlet fever toxin. In this manner less toxin is used, fewer (three) injections are made and reactions are avoided. Lately Earle² of Desplains, Ill., has used this plan successfully. Previously others had reported the intradermal method for active immunization against anthrax, typhoid and diphtheria.

Immune globulin (placental extract) may be injected intramuscularly with the object either of preventing or of modifying measles. If the intention is to prevent measles, 2 cc. should be injected within forty-eight hours of exposure and the same size dose repeated about five days later. For modification 2 cc. of the immune globulin is injected usually from five to seven days after exposure. It must be remembered that the method for prevention constitutes only a temporary immunity. On the other hand, modification of the disease results in the same degree of immunity as occurs after an unmodified attack of measles. Modified measles, however, can be transmitted to those who are susceptible, and these may suffer from severe attacks. For this reason the method for modification is not suitable, as a rule, in hospitals or institutions where the necessary aim is generally prevention.

Active immunization against typhoid is a thoroughly reliable procedure. Typhoid vaccine usually contains

2. Lett, Hugh: Two Unusual Conditions of Gallbladder: One a Case of Torsion, *Lancet* 1:99 (April) 1909.

1. Robinson, J. H.: *J. Immunol.* 31:373 (Nov.) 1936.
2. Deceased.

about one billion bacillus typhosus organisms per cubic centimeter. Combined with this about 750 thousand each of paratyphosus A and B are frequently used. The vaccine is administered subcutaneously in three doses of 1 cc. each at seven to ten day intervals. The point of injection is usually over the deltoid muscle. Protection generally lasts for about three years.

METHODS FOR PASSIVE IMMUNITY AND TREATMENT

Animal and human antisera are valuable therapeutic aids in certain acute infectious diseases. Their efficiency has been firmly established for both prophylactic purposes and treatment of acute conditions.

Diphtheria antitoxin is the best example of a thoroughly efficient animal serum for the treatment of disease. Antitoxins for tetanus, scarlet fever, meningococci infections, staphylococci infections, gas bacillus and erysipelas are among the better known. All of these are produced in the horse. Tetanus antitoxin is sometimes developed in the cow as well. Bovine tetanus antitoxin may be used for man when known sensitivity to horse serum exists. Antipneumococcus horse serum, which was first available for pneumonia of types I and II, is now produced also in the rabbit. The field of usefulness for antipneumococcal serum is being rapidly expanded by the production of antisera for a number of the other types, including III, IV, V, VI, VII, VIII and XIV.

PROPHYLACTIC DOSAGE

Estimation of the proper dose for any one of the antisera is sometimes a difficult problem. There is no standard rule or method which is always satisfactory. For diphtheria prophylaxis, when immediate protection is desired for a susceptible contact, it is a common practice to administer 1,000 units of diphtheria antitoxin. This quantity is injected intramuscularly. Since the protection afforded is a passive immunity it is not enduring and usually does not last for more than from ten days to three weeks, the antitoxin being rapidly eliminated. For passive immunity to tetanus the dose is generally 1,500 units, though sometimes because of the nature of an injury or on account of delayed administration double that quantity is injected and occasionally for special reasons the dose should be repeated in five days. Needless to state, the antiserum should be given at the earliest possible moment.

DOSAGE OF ANTISERUMS FOR ACUTE STAGE

I have referred to the fact that there is no satisfactory method for determining accurately the dose of an antiserum which is applicable to all patients. Nevertheless a mathematical means for gauging the dose of diphtheria antitoxin was offered many years ago. It was stated that 100 units per kilogram of body weight was sufficient for a mild or average attack of diphtheria and that 500 units per kilogram sufficed for severe diphtheria. In practice this mathematical method is not satisfactory. It seems much more important to base the dose on the site of infection and the duration of the disease. In postnasal or nasopharyngeal diphtheria the rate of absorption of toxin is much more rapid than when the diphtheria membrane is confined to the tonsils. Consequently the dose of antitoxin should be greater in the former condition. Likewise the longer the patient has been ill without antitoxin administration, the greater is the quantity of toxin produced and therefore the larger is the amount of antitoxin required. However, since toxin combines with the body tissues and is not then readily vulnerable by

the antitoxin, it is principally the free toxin which can be neutralized or rendered inert by antitoxin. This makes the necessity for early administration of antitoxin apparent and explains why diphtheria antitoxin is not of value in the treatment of postdiphtheritic paralysis.

One's own experience must serve in a large measure as a guide in deciding how much antiserum shall be used for any given patient. In an experience of more than twenty-five years in contagious disease hospitals I have found that diphtheria antitoxin in excess of 60,000 units is seldom if ever beneficial. In most instances our total dose is not more than 40,000 units. Having decided on the maximum amount of antitoxin that seems necessary it is best for one to give the total quantity at once and not in divided doses. If it is later believed that an error in judgment occurred regarding the size of the dose, an additional amount should be injected. The administration of diphtheria antitoxin does not constitute the sum total of all treatment. It is the primary and most important part of treatment except in certain types of laryngeal or laryngotracheal diphtheria in which surgical intervention is even of greater necessity than antitoxin. A discussion of intravenous dextrose as an adjuvant in the treatment of diphtheria is not within the province of this article.

Tetanus antitoxin presents even more difficult problems for solution in respect to dosage than does diphtheria antitoxin. Again experience must be the judge. Lately the tendency to give extremely massive doses of tetanus antitoxins has not been so apparent in some sections of the United States. Increasing dependence seems to be placed on sedation, some believing from 60,000 to 100,000 units of tetanus antitoxin sufficient for any tetanus patient whose recovery is possible.

What has been said with regard to diphtheria and tetanus antitoxin dosage also applies to the use of scarlet fever antitoxin and any of the other immune sera whether they are antitoxic or antibacterial products. Early administration is of great importance. The age of the patient is not as essential a factor in deciding on dosage as virulence of the organisms, susceptibility of the patient, duration of the disease and in some instances the site of the infection. Nothing, however, is so helpful as one's own experience.

ROUTES FOR INJECTION

Most antisera have been given by one of three routes: (1) subcutaneous, (2) intramuscular or (3) intravenous. Originally the subcutaneous method of injecting antisera was the most common. Today it is the least used. The intramuscular route is the one most often employed. Absorption is much more rapid and there is less pain when the antisera are properly administered; it is also a reasonably safe procedure which can be adopted in the home as well as in the hospital.

During recent years particularly, intravenous therapy has been broadly extended. This route was strongly advocated by some for the administration of diphtheria antitoxin more than twenty years ago. The method is not recommended for patients confined in the home. From time to time it is selected for hospitalized diphtheria patients. It is doubtful whether the administration of diphtheria antitoxin intravenously will save a patient who would not recover by means of intramuscular treatment. On the other hand there is an increased tendency, as previously mentioned, to use the intravenous route for immune sera.

In the contagious disease hospitals of Chicago all antimeningococcus serum and meningococcus antitoxin are given by the intravenous route. Nothing is introduced intraspinally when treating patients with meningococcal infections whether there is evidence of meningitis or not. This change in method of treatment was made by us in 1934, before the introduction of sulfanilamide, and has produced excellent results. The belief that tetanus antitoxin should be given intraspinally is no longer universally accepted. It is my opinion that the treatment of tetanus without intraspinal therapy is advisable. In any form of blood stream infection, intravenous administration of an antiserum seems logical. In this connection outstanding examples are septicemias due to the meningococcus, streptococcus and staphylococcus.

In the past, antisera have been administered in practically every conceivable manner. In addition to those routes mentioned are the intracisternal, intraperitoneal, intrapleural and also oral and rectal. Today the intramuscular and intravenous routes are the methods of choice.

Regardless of the route chosen, serum should not be injected when cold. Under such a condition it is likely to cause severe pain if injected in the muscle and will be absorbed slowly. If cold antiserum is given intrathecally or intravenously, it may cause serious shock. The serum should be at body temperature before administration regardless of the route chosen. But a temperature much above 98 F. may lessen or destroy the potency of serum and even cause coagulation.

INTRAVENOUS ADMINISTRATION OF SERUMS

Any animal antiserum when given intravenously is best diluted in physiologic solution of sodium chloride or in from 5 to 10 per cent dextrose in saline solution. The diluent should be of at least equal volume to the serum; it may be more than double the volume. To the mixture we add from 5 to 15 minims (0.3 to 1 cc.) of solution of epinephrine hydrochloride (1:1,000) depending on the age of the patient. The drip method should be selected and the flow at body temperature ought not exceed from 10 to 15 drops a minute at first. Later if the patient shows no unfavorable symptoms the rate of flow can be increased often to 60 drops a minute. With this method I have given as much as 1,200 cc. of horse serum (meningococcus antitoxin) to a patient within four days' time without any disturbing symptoms being noted.

SERUM SICKNESS

Fear of serum reactions has existed in the minds of physicians since the early adoption of biologic products for therapeutic purposes. While it is well known that serum reactions have been of common occurrence in connection with the administration of animal serums, the possibility of fatal consequences often has been magnified greatly during past years. Among 20,000 diphtheria patients treated in the Municipal Contagious Disease Hospital, Chicago, from 1917 to 1938, no anaphylactic death has occurred. Nor has it ever been customary to make routine sensitivity tests in that institution.

With the improved methods for concentration and refinement of animal antisera which are in use today there is less reason than ever before to anticipate a high frequency of protein shock as a result of serum administration. Nevertheless it must be realized that serum reactions do occur and proper means should be adopted in an endeavor to prevent or minimize them.

If a patient is known to be sensitive to horse serum it may be possible to avoid the use of serum of that animal. This can be done in the case of tetanus by giving bovine tetanus antitoxin. If horse serum must be used for an asthmatic patient or some one who is known to have been treated with a horse serum on some previous occasion, it is well to make a sensitivity test and, if positive, to attempt desensitization by the usual graduated injections of small amounts of the serum. Although this is a worthy procedure, its actual value sometimes seems doubtful.

The usual form of serum sickness manifests itself in from eight days to two weeks following injection. If the serum was given intravenously the reaction generally occurs earlier, often in from six to ten days. The symptoms presented include some or all of the following: elevation of temperature, urticarial eruption, painful joints and lymphadenitis. It is worthy of note that serum sickness of this type when developing in patients with meningococcal meningitis may be accompanied by an increase in cell count and spinal fluid pressure.

Treatment consists of solution of epinephrine hydrochloride (1:1,000) from 0.3 to 0.5 cc. subcutaneously, intramuscularly or intravenously, depending on the degree of reaction. Free catharsis and local application of calamine lotion to relieve itching is helpful. In my experience the administration of calcium gluconate intravenously has not been of marked value. Nevertheless it is sometimes deserving of trial.

Accelerated or immediate reactions may develop in persons who have been treated previously with horse serum. Such reactions may occur within a few hours following serum administration or during the progress of intravenous serum injection. Reactions of this kind are not necessarily more severe than those previously described as the usual form.

ANAPHYLACTIC SHOCK

The most severe of all serum reactions may develop almost at the instant the serum is injected or follow within a period of about one hour. The severity of the reaction does not always seem to depend either on the amount of serum given or on the route selected. Sometimes there is a convulsion, the pulse rate becomes very rapid and is thready in character, cyanosis may develop, respirations are accelerated and shallow, profuse sweating occurs and death takes place. Pulmonary edema is usually present under such circumstances. Should acute anaphylactic shock occur, solutions of epinephrine hydrochloride (1:1,000) from 0.5 to 1 cc. should be administered at once. If the serum was administered in an extremity, a tourniquet should be applied proximally to the site of injection.

ARTHUS PHENOMENON

The Arthus phenomenon is a local tissue reaction and is occasionally seen when a second injection of animal serum is made near the site of a former injection. It is never likely to occur if the second injection is made within five days' time. It is characterized by swelling and marked induration, which may involve both the subcutaneous and the muscular tissues. As a rule the reaction does not develop rapidly but may result in a marked sloughing of tissue. There may be considerable pain in the part involved, which generally is better relieved by cold compresses than by hot applications. To avoid the possibilities of an Arthus phenomenon it is well never to make a second subcutaneous or intramuscular injection of serum near a prior one.

HUMAN IMMUNE SERUM

Sometimes it is asserted that human convalescent serum should be of particular value in the prevention or treatment of virus diseases. Practical experience does not indicate that such a contention is always true. Whereas it is a fact that the serum of convalescent patients is of great value in the prevention of measles and to some extent as a prophylactic for chickenpox when given early enough, it is generally believed that convalescent poliomyelitis serum is worthless for preventive purposes; nor is there sufficient evidence to uphold an opinion that human convalescent serum is of value for the treatment of any of these diseases. Convalescent serum has also been used for the prevention of mumps and whooping cough and for the treatment of a number of nonviral diseases including scarlet fever, meningococcic meningitis and erysipelas. The folly of administering convalescent serum for the last named disease should be apparent when one considers that the average erysipelas patient acquires practically no immunity from an attack of the disease. Consequently there is no basis for anticipating that the blood or serum of a convalescent erysipelas patient will contain sufficient antibodies to be of therapeutic value.

MEASLES CONVALESCENT SERUM

Human convalescent measles serum is of undoubted value for prevention when administered within three days of exposure. The dose, injected in the outer muscles of the thigh, varies from 5 to 10 cc. according to the patient's age. Protection is only temporary, usually from ten days to three weeks. When convalescent measles serum is administered more than three days after the exposure of the susceptible person, it is likely to modify the disease even if it does not prevent it.

Normal adult serum or whole blood is also used for passive immunization against measles. In either case the quantity injected should be greater than if convalescent serum were being used. For normal serum the dose is generally from 10 to 20 cc., while for whole blood as much as 30 cc. is required.

Human convalescent serum for chickenpox, mumps and whooping cough has been employed in a manner similar to the measles serum but not with the same degree of success. Convalescent scarlet fever serum is of value as a prophylactic.

Of all human immune serums to be used, convalescent scarlet fever serum seems to be by far the most efficient. Nevertheless it has been claimed that human convalescent scarlet fever serum is only one thirtieth as potent as scarlet fever antitoxin. The latter conclusion seems doubtful from observations made on the treatment of several thousand cases of scarlet fever with human convalescent serum. Possibly human immune scarlet fever serum possesses some therapeutic properties which cannot be measured by ordinary laboratory methods.

The advantage of immune human antisera of known efficiency over animal serums is the absence of serum reactions. For this reason repeated doses regardless of time intervals may be injected without fear of serum sickness. Moreover, serum may be given in large quantities, if need be, by the intravenous route without unpleasant effects and without the necessity of dilution. When administering human antisera intravenously it is needless to say that no typing or matching of blood is required. For a number of years practically all human convalescent scarlet fever serum used in the contagious disease hospitals in Chicago has

been injected by the intravenous route. The dosage generally varies from 20 to 100 cc., depending on the severity of the case.

Immunotransfusion in the treatment of acute infectious diseases is sometimes adopted as a last resort when the prognosis seems to be particularly desperate. Selection of the donor involves the necessary typing of blood, and the success of the undertaking is influenced by the antibody content of the source of the blood. The transfusion in itself, however, may be of great benefit regardless of any immunizing substances transferred by the operation.

LYOPHILE

Lyophile, dried human blood serum, offers great possibilities. It is prepared by freezing at low temperatures and rapid dehydration under high vacuum. Lyophile can be preserved for long periods in sealed ampules and antibody properties retained. For use it is merely dissolved in sterile distilled water. Convalescent serums have been subjected to this process and the lyophile injected for therapeutic purposes. Bond and Wright at the University of Pennsylvania have reported on the intravenous injection of lyophile following shock or hemorrhage.

Eventually sulfanilamide may displace, to a considerable extent, some of the biologic preparations now in common use. This new drug is particularly effective in erysipelas and streptococcic meningitis. It is also of undoubted value in meningococcic meningitis. But its value in scarlet fever seems very questionable on the basis of personal observations.

CONFERENCES ON THERAPY

TREATMENT OF INFECTIONS OF THE GENITO-URINARY TRACT

NOTE.—These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital, with the collaboration of other departments. The questions and discussions involve participation by members of the staff of the college and hospital, students and visitors.

DR. McKEEN CATTELL: Our subject this morning, "The Treatment of Infections of the Genito-Urinary Tract," is one in which there has been a considerable advance in the past few years, an advance which has included the introduction of a number of new drugs. Dr. Modell will open the discussion with a presentation of some of the broader principles of treatment and a consideration of the pharmacology of some of the drugs employed.

DR. WALTER MODELL: There are four general problems in the treatment of urinary infections: (1) the regulation of urinary volume, (2) the regulation of the urinary pH, (3) the effect of antiseptics on the human host and (4) the effect of the antiseptics on bacteria.

Urinary volume may be shifted in either direction, toward an increase or a decrease. The volume of urine may be increased in an attempt either to flush out the urinary tract or to dilute the irritants which are found in infected urine, or it may be decreased to obtain a more concentrated solution of an antiseptic which is being used. Either can be achieved by regulating the water intake. To increase the volume, as much as 5 or 6 liters of water a day may be given; to decrease it, fluid may be limited to 1 or 1.5 liters a day.

The regulation of the p_H of urine is important. A change of the urinary p_H may itself exert antiseptic actions. Furthermore, some of the antiseptic agents are either most effective or effective only within certain p_H ranges. In an extensive series of observations the p_H of normal urine was found to vary from about 4.8 to 7.5, with the mean at about 6. The excretion of acid urine is an expression of mechanisms in the body which maintain the constancy of p_H in the blood. Because of the efficiency of these mechanisms it is possible to achieve marked changes in urinary p_H without affecting the p_H of the blood. The important buffers in the urine are the *mono*-sodium *di*-hydrogen phosphate and the *di*-sodium *mono*-hydrogen phosphate. In the plasma the ratio of acid to basic phosphate is about four to one in favor of the basic phosphate. In the excretion of these substances by the kidneys most of the basic phosphate is reabsorbed in the tubules and the acid phosphate is excreted so that in the urine the ratio is reversed to about nine to one in favor of the acid phosphate. However, if the diet is alkali forming, more of the basic phosphate is excreted and the urine becomes alkaline.

The urinary p_H can be changed by dietary measures by interference with the carbohydrate and fat metabolism and by the use of drugs. In a general way a vegetable diet or alkaline-ash diet results in the development of alkaline urine, whereas a high protein diet or acid-ash diet produces an acid urine. There are some vegetables which contain benzoates which give rise to the elimination of hippuric acid, which in turn tends to acidify the urine. It is rarely possible by dietary measures alone to produce the extremes of acidity and alkalinity which are therapeutically useful. The ketogenic diet will be discussed later.

Alkalizers are sodium and potassium bicarbonates, sodium and potassium citrates and sodium and potassium acetates.

Acidifiers are solution of hydrochloric acid, solution of phosphoric acid, solution of nitrohydrochloric acid, sodium acid phosphate, ammonium chloride and ammonium acid phosphate.

Drugs afford the simplest way of changing the urinary p_H . In order to make the urine alkaline there are a number of alkalis other than those listed which are effective. Sodium or potassium bicarbonate may be given, but the citrates and the acetates are used more frequently because they have little effect on gastric acidity. In the body the latter are oxidized and excreted mainly as carbonate, so that the urine becomes alkaline.

There are various substances which make the urine acid. One can use acids: hydrochloric acid, phosphoric acid or nitrohydrochloric acid. One of the most commonly used drugs for acidifying is sodium acid phosphate. I think it deserves special mention. Sodium acid phosphate is a buffer. It acts as such when eliminated in the urine and therefore is not a very reliable acidifying agent. It has been reported to make some urines more alkaline. Sodium acid phosphate was used most enthusiastically when urinary acidity was determined by titration against alkali. However, when changes in urinary acidity were studied in terms of hydrogen ion concentration it was found that the sodium acid phosphate was not as effective as formerly thought. It is also important that sodium acid phosphate is poorly absorbed, and if large doses are taken it acts as a cathartic.

The ammonium salts are much more reliable, and it is easy to understand why. In ammonium chloride, for example, the ammonium fraction is split off and converted into urea, leaving free hydrochloric acid; similarly with other ammonium salts, free acid radicals are left after the conversion of the ammonium to urea. It is therefore possible to effect marked changes in urinary p_H , and if large doses are used it is also possible to produce a true acidosis. This is an especially important consideration in the face of renal insufficiency. If the usual doses of ammonium chloride do not produce acid urine it is wise to examine the carbon dioxide combining power of the blood to determine whether acid is accumulating in the blood. The impaired kidney may not be able to excrete acid rapidly enough and acidosis may develop without appreciable change in the p_H of the urine.

I think it is well to mention in discussing urinary acidity that it has been stated that therapeutic doses of the acidifying agents cannot shift the urinary p_H beyond the extreme acid limits of normal urine; that is, beyond 4.7 or 4.8.

The use of alternate acidification and alkalization in an attempt to eliminate infections is, I think, outmoded. It has been shown that certain organisms, such as *B. coli* and some of the streptococci and staphylococci, remain viable in mediums the p_H of which is beyond the limit to which one can shift the urine either in the alkaline or in the acid direction by the use of drugs.

URINARY ANTISEPTICS

A partial list of some of the urinary antiseptics which have been used includes oil of santal, hexylresorcinol,¹ pyridium,¹ serenium,¹ picochrome (benzochrome),¹ methylene blue, mercurochrome, acriflavine, potassium permanganate, strong protein silver, methenamine, sulfanilamide, the ketogenic diet (beta-hydroxybutyric acid) and mandelic acid (sodium and ammonium mandelate). Antiseptics come and go, and the only ones who remain faithful to their memories are their manufacturers.

Up until very recently one of the most common drugs taken by mouth was methenamine. In an acid medium methenamine breaks up and liberates free formaldehyde. A urinary p_H of 5.5 or less is required for this effect. It has been said by some that 0.5 per cent of methenamine is not effective against most organisms and that this concentration is much too irritant to the mucosa of the urinary tract to be used. However, there are many clinicians who have found methenamine an effective agent in the treatment of infections, perhaps the most reliable until recent years.

I think the most important thing about the dyes used in the treatment of urinary infections is that experimentation with some of them aided in the discovery of neoprontosil and sulfanilamide.

We have discussed sulfanilamide here before, but there are several things I want to emphasize:

1. Sulfanilamide not only is excreted in the urine but it also permeates all the tissues of the body, so that it has the advantage of affecting organs associated with the urinary tract, such as the prostate and seminal vesicles, which are not drained or flushed by urine.

2. As sulfanilamide is quantitatively excreted in the urine, it is possible by controlling the urinary volume and regulating the dosage to achieve desired concentra-

¹ These do not stand accepted by the Council on Pharmacy and Chemistry.

tions of sulfanilamide. The minimal effective concentration in the urine is said to be between 100 and 200 mg. per hundred cubic centimeters, or between 0.1 and 0.2 per cent of sulfanilamide.

Sulfanilamide is said to be most effective in an alkaline medium, but alkaline urine is not essential since it is quite effective in an acid urine as well.

The ketogenic diet, which consists primarily of eggs and heavy cream, has been shown to be an effective means of treating urinary infections. In the ketogenic diet because of the limited amount of carbohydrate the high fat content is not completely metabolized and large amounts of the ketone bodies are eliminated in the urine, the urine becoming highly acid. The chief disadvantage is that it is very unpleasant and that the amounts of eggs and cream used run up the cost of therapy considerably. It has been demonstrated that the effective agent in the ketogenic diet is beta-hydroxybutyric acid, which is eliminated in the urine. Unfortunately beta-hydroxybutyric acid cannot be used in the normal as a therapeutic agent because it is completely metabolized except in the presence of ketosis. It may, however, be used to fortify the ketogenic diet itself or it can be introduced directly into the urinary tract. It was the bactericidal action of beta-hydroxybutyric acid which led to the discovery of mandelic acid.

Rosenheim, investigating a number of hydroxy acids, found that mandelic acid, which is eliminated quantitatively in the urine, is effective against a number of bacteria *in vivo* as well as *in vitro*. Mandelic acid is effective only when the p_H is 5.5 or less. The minimal concentration of mandelic acid necessary in the urine is about 0.5 per cent, although if the p_H of the urine is considerably below 5.5 a less concentrated urine may be effective. Mandelic acid is fairly rapidly absorbed, and twenty-four hours after a single dose almost all of it is eliminated in the urine. Mandelic acid often causes gastric disturbances, and it has also been reported that it causes transient renal function changes. In order to avoid the gastric disturbances, the sodium salts and the ammonium salts of mandelic acid have been used. It is well to mention that ammonium mandelate has the additional advantage of being an acidifying agent. However, even with ammonium mandelate it is generally necessary in order to get urine sufficiently acid to use some acidifying salt, such as ammonium chloride and dietary measures. The water intake is usually limited.

The drugs I have considered are those which, when taken by mouth, are eliminated as effective agents in the urinary tract. These act presumably from the renal pelvis down. There are various substances, such as acriflavine and other acridine dyes, the silver proteinate and potassium permanganate, which are injected directly into the urethra and sometimes into the bladder. There are advantages in each method of treatment. However, a urinary antiseptic which can be taken orally generally acts for a considerably longer period of time than those introduced directly into the urethra and also acts over a greater part of the urinary tract.

The broad pharmacologic aspects which have been considered are not the only factors which determine the therapeutic regimen in urinary infections. There are other clinical features in patients which influence the choice of drug and details of therapy. These will now be discussed.

SOME PRACTICAL CONSIDERATIONS OF TREATMENT

DR. ALEXANDER R. STEVENS: The practical application of these drugs I think should be preceded by a few observations on the different kinds of infections that occur in the urinary tract. Otherwise one proceeds rather blindly. As you know, urinary infections may be put into two groups with respect to the initial site. They may begin in the excretory part of the urinary tract and therefore show pus and bacteria in the urine very early, or they may begin in the deeper structures, notably the parenchyma of the kidney and prostate, and may not show any pus or bacteria in the urine. One has two very different problems in these two types of cases. In individuals with pus and bacteria in the urine one might expect benefit from the use of a drug which is excreted in the urine as an antiseptic, a bactericide or even only a bacteriostatic agent, whereas one would expect, *a priori*, little or no help at all in treating, for instance, a cortical infection of the kidney or prostatitis. It is only in comparatively recent times that we have had an antiseptic drug which is present actively in the blood and the tissues as well as the urine. That widespread activity opens up the field of the treatment of deep-seated infections.

As for urinary tract infections that occur with pus and bacteria in the urine, there again one must consider two groups: one without any foreign body or obstruction in the urinary tract, and the other with foreign body or an obstruction. Those patients without any calculus, which is the foreign body I refer to especially, or without any obstruction in the urinary tract (whether it is in the ureter, bladder or urethra, the problem is one) may acquire acute infection and recover spontaneously without any specific treatment. Indeed, one meets with many such acute infections, which clear up entirely without any recurrences, with merely hygienic care and rest in bed, whereas the patients who have foreign bodies (such as drainage tubes and calculi) or obstructions are rarely permanently relieved of urinary infections without the proper care of those foreign bodies and obstructions. Occasionally one can sterilize the urine behind the obstruction, but usually not until that obstruction is taken care of. The tendency these days I think is to give one of these more potent, more recent, remedies and forget the underlying trouble which not only makes possible and probable a quick recurrence of infection but also may itself do considerable harm to the upper urinary tract.

Most of the antiseptics that have been listed here I think are enumerated largely for historical perspective. I myself have tried practically everything on that list and would be perfectly willing in practice to eliminate everything down to methenamine (urotropin). Many of the other drugs are notable largely for their colors, both before administration and as excreted in the urine. If a patient wants his linen stained any particular shade, one can pick a drug to accommodate him but that is about all the satisfaction he gets. Many articles have been written on all of these so-called antiseptics, listing records of hundreds of patients who have profited by them, but I think you will find that most urologists today are very skeptical of the whole batch.

Methenamine, as you have just heard, is active chiefly because in an acid urine it breaks down, producing formaldehyde, but it is active only in urine and not in the tissues. It is excreted from the kidney as such

and breaks down after excretion, so that one may expect help only in the type of infection that is associated with the excretory urinary passages. This therapy is comparable to continuous irrigation over the mucous membrane with a very mild antiseptic solution. It does not get down in the depths of the tissues. If you are dealing with a deep-seated infection of the kidney, the pelvis, the bladder or the prostate, little or no therapeutic aid should be expected from methenamine. Its great value I think is as a prophylactic. I have often asked patients whom I was going to treat instrumentally to start taking methenamine twenty-four hours before the treatment and keep it up for twenty-four hours afterward and then quit, merely with the idea that we might prevent multiplication of any bacteria introduced by the passage of urethral instruments.

The ketogenic diet I will speak of very briefly. I think Dr. Modell was very mild in his description of the patient's attitude toward that diet. I have had individuals who could stick it out for a week, and that is about as far as most people want to go. One patient after a week of it would start vomiting when she heard the maid coming down the corridor with her meal tray. The food did not even get into the patient's room. The very thought of all that fat, the olive oil, the butter and the cream started things going. When the ketogenic diet could be replaced by mandelic acid therapy with apparently equal benefit to the patient, there was certainly a tremendous advance.

Mandelic acid is employed very widely. It operates, as you have heard, only in an acid urine. If given in the form of the ammonium salt, it tends to make the urine acid. If necessary to secure greater acidity, one of various drugs may be added, usually ammonium chloride or nitrate. It is necessary to have at least a half of 1 per cent mandelic acid in the urine to be most effective. Some authors suggest twice that much. As you have just heard, the more acid the urine, the more effective the mandelic acid, so that with a very acid urine a lower strength of mandelic acid may suffice. It is usually not given in large enough quantities. It is wise to administer about 12 Gm. in a twenty-four hour period in order to secure sufficient concentration in the urine. Mandelic acid is effective with most organisms which occur in the urine but remember that this therapy is satisfactory only when the p_H of the urine is 5.5 or lower. With certain bacteria, notably the proteus, one rarely can secure such a reaction. Hence in these instances mandelic acid is useless.

Finally the great concentration these days is on sulfanilamide, which has quite revolutionized the treatment of infections in urology. Here is a drug that is potent in dealing with nearly all bacteria, whether found in an acid or an alkaline urine. Those who have done the most work find one or two organisms that are not much influenced by sulfanilamide, but it does dispose of most of the organisms commonly found in urine (cocci and bacilli) excepting the tubercle bacillus. I do not think anybody has claimed anything for that. As sulfanilamide is somewhat more effective in alkaline urine than in acid urine I make a practice, in common with many others, of giving an alkali with the sulfanilamide. There is the great advantage too that it may be administered under the skin or intramuscularly and also intravenously, but the latter route is not very often necessary.

The dosage is usually up to from 5 to 6 Gm. in a twenty-four hour period. The rule that some have

advised, which I think is a very good one, is 1 gram for each 20 pounds of body weight, with a maximum, however, of perhaps 6 Gm.; but in some instances patients have tolerated well as much as from 10 to 15 Gm. a day.

There are certain toxic possibilities associated with sulfanilamide that we do not have with most of the other urinary antiseptics. Hence I think one should be cautious in giving sulfanilamide to patients who are not confined to bed and not under constant observation.

There is one drug which is not on the list presented for consideration, which I think you ought to know about, and that is arsphenamine or neoarsphenamine, which is very potent in some instances of coccic infection. Until all this furor over the two new drugs, it was one of the outstanding marvels in urology that in some cases of a pure staphylococcic infection of the urinary tract, which is not very common and which often resists all other forms of treatment, the infections react favorably and quickly to that drug given intravenously.

SPECIAL CONSIDERATIONS RELATING TO TREATMENT DURING PREGNANCY

DR. HERBERT F. TRAUT: I am very glad that Dr. Stevens pointed out the importance of obstructions in connection with urinary tract infections. In pregnancy we have to deal with a physiologic obstruction. The hormones of pregnancy which relax the smooth muscles of the uterus and thus make the continuation of pregnancy possible have a similar effect on the urinary tract. They produce an atony of the ureter, so that its normal peristaltic activities are suppressed and sometimes obliterated. In addition, as pregnancy progresses there is enlargement of the uterus, when the woman is in the upright position the inlet of the pelvis is blocked, and the ureters are occluded more or less completely. The result is urinary stasis, dilatation of the tract and the formation of what has come to be known as the physiologic hydro-ureter of pregnancy.

Unfortunately some women who become pregnant have had pyelitis previously without complete eradication of the infection. In these women who may have chronic pyelitis the physiologic obstruction provides an opportunity for exacerbation. They may, however, have the primary attack during pregnancy. The factors important in the development of the primary attack are not all understood. There is investigative work needed before we shall know as much as we should about the etiology of the disease. However, we feel we have made a step ahead in that we understand some of the causes and can now obviate many of the features of the physiologic stasis associated with pregnancy.

There is also another factor which makes infection of the tract a little more frequent in the pregnant woman or in the parturient woman, and that is that the trauma of delivery necessarily affects the base of the bladder and probably makes the bladder more susceptible to infection. This background in a bladder which is atonic, which tends to overfill, requiring repeated catheterization in the puerperal period with the inevitable introduction of organisms with each passage of the catheter, certainly makes for a situation which is productive of a fairly high incidence of postpartum urinary tract infections. The incidence of pyelitis in pregnancy in New York is about 2 per cent in our experience.

We are particularly interested in treatment today so perhaps we had better give most of our attention to that phase of urinary tract infections in pregnancy.

The first thing which we ought to consider is prophylaxis. How can these urinary tract infections in the pregnant woman be obviated? There are certain prodromal symptoms which, if sought for when the patient comes for antepartum care, give a pretty good indication of impending upper urinary tract infection. Dysuria is frequent but a more common complaint is pain in the flank or even in the costovertebral angle of the right side. Often an intravenous pyelogram of a patient complaining of these symptoms demonstrates a high grade hydro-ureter and hydronephrosis of the type common in pregnancy. These symptoms can be controlled quite satisfactorily by having the patient lie down frequently, to take the weight of the uterus off the ureters. *In addition the patient may be given a grain or 1½ grains of quinine one, two or three times a day.*

More important, if there is dysuria and clumped pus cells in the urine, it is time to force fluids, alkalize the urine or use methenamine in an acid urine. I think it is fair to say that if it was possible to get every pregnant woman early in the pyelitis and give her this conservative care, one probably could abort a high proportion of primary cases of early pyelitis. That is not necessarily true of the chronic cases which are exacerbations of a previously existing urinary tract infection. We watch for both types in the antepartum clinic with a good deal of care and feel that we do abort a fairly good number of pyelitis cases in their incipience.

In a full blown upper urinary tract infection, with a hectic type of fever, what is to be done? The patient must go to bed; the horizontal position with drainage is just as important as ever. We find what the causative organism is because in our experience mandelic acid, as Dr. Stevens pointed out, is of very little use with the proteus type of organisms, but certainly with the aerogenes it should be used. With a proteus type of organism we use sulfanilamide. We prefer to use sulfanilamide for all other types of infection when the patient is in the hospital. On the other hand, if the patient is ambulatory, we still adhere to the use of mandelic acid except with the proteus organism.

There are several things to be observed in the patient who is actively febrile. In the first place, one must determine whether the infection is unilateral or bilateral. If it is bilateral one cannot afford to use palliative measures for months. What Dr. Stevens said about clearing up infections in the presence of obstructions is absolutely true. In pregnancy we can seldom clear the tract of infection during pregnancy. All we can do is to palliate, hold it in abeyance, and the real curative process must wait until after the pregnancy has been terminated and the obstruction removed. We are interested in bilateral infections because the inflammatory reaction going on over periods of months may produce damage in the mother which is out of proportion in its complications to the loss of the child. We always carefully evaluate these patients with bilateral involvement, particularly if there is a great loss in weight. If the infection does not yield after eight or ten days of conservative treatment, and particularly if the patient has a couple of months to go to reach term, we consider the advisability of interruption of pregnancy. We do not resort to it very often; however, the possible necessity is always in the back of our minds. The other thing we watch for particularly is involvement of the renal cortex. The earliest indicator we have of this complication is elevation of the non-

protein nitrogen in the blood. If this rises to above 50 mg. per hundred cubic centimeters we empty the uterus regardless of whether the lesions are bilateral or unilateral, because in our experience we have had great regrets when we have neglected the warning. The death rate in individuals who have a nonprotein nitrogen of over 50 mg. per hundred cubic centimeters—the normal in pregnancy is about 30 or 35—is about 25 per cent, a very high mortality.

We use mandelic acid in an acid urine exactly as has been outlined. With sulfanilamide therapy we like to administer 4 or 5 Gm. a day, always with sodium bicarbonate. We prefer not to give it to ambulatory patients but rather to get the patient into the hospital so as to force the treatment rather than to carry it out over a prolonged period. We have had very satisfactory results with both of these drugs.

In closing, I want to emphasize again that we do not cure patients of upper urinary tract infection during pregnancy. They must be followed afterward. The follow-up must be done in a cystoscope clinic, and sometimes it takes from three months to a year to eradicate the infection completely. The addition of mandelic acid and sulfanilamide to our armamentarium has helped very much.

If a patient has had pyelonephritis or bilateral upper urinary tract infection, we like to allow a year or two years to pass before pregnancy is again contemplated. We give contraceptive advice to these individuals, and if pregnancy does occur we hospitalize them and evaluate renal function before we allow pregnancy to progress. We are a little radical in our attitude because in bilateral pyelitis and in well authenticated pyelonephritis we have had very serious sequelae.

DR. CATTELL: Urinary infections present a common condition in children, and I will ask Dr. Levine if he will say something regarding the special problems which arise in connection with the treatment of urinary infections in infancy and childhood.

DR. SAMUEL Z. LEVINE: The general subject has been adequately covered. Perhaps we should define what we mean by urinary tract infection in childhood before we go on to a discussion of it.

Does urinary tract infection in childhood mean the presence of both pus and bacteria in the urine or may it be represented by a bacilluria in the absence of a pyuria? This still remains a moot question, but in routine catheterizations of thirty-four female infants under 2 years of age bacilli were found in 28 or 82 per cent of the urines in the absence of any white blood cells, indicating that bacilluria in infancy is a more common condition than we are prone to believe. In twenty-one cases *B. coli* was present in the urine in the absence of demonstrable infection of the urinary tract. The term pyuria should be limited to the persistent presence of clumps of pus in uncentrifuged, clean specimens of urine. Only these urinary observations represent a true urinary tract infection in childhood.

Of some interest is the question of terminology. At one time the name pyelitis was given to all types of urinary tract infection in children. There is no evidence at the present time to indicate that the entity, pyelitis per se, inflammation of the pelvis of the kidney, in the absence of interstitial suppurative involvement of the kidney, is a common phenomenon. In most autopsies one finds in addition to the inflammation of the pelvis interstitial abscesses in the kidney parenchyma itself, so no longer do we use the term pyelitis but

prefer the terms acute and chronic pyuria, leaving the localization of the site of infection unnamed.

Urinary stasis probably plays as important a role in producing urinary tract infections in childhood as in pregnancy. Only rarely does one see a chronic or a recurrent pyuria in childhood in the absence of a congenital anomaly producing urinary stasis and secondary infection. If medical therapy is ineffective in overcoming the pyuria after a period of from four to six weeks, all children should be subjected to complete urologic examination. In over 90 per cent of chronic pyurias in childhood we find associated congenital anomalies.

In discussing the therapy, I shall also confine my remarks to the ketogenic diet, mandelic acid therapy and sulfanilamide.

Ketogenic diets are as unpalatable in childhood as they are in adult life.

Mandelic acid therapy is as effective in childhood as in adults. The dosage that we use aims to produce a urinary concentration of between 0.5 and 1 per cent and a reaction of less than 5.5 (p_H). If one gives approximately 1 Gm. of mandelic acid per excreted hundred cubic centimeters of urine, it should be within the required dosage. Since infants excrete about 400 to 600 cc. of urine a day, 4 Gm. of mandelic acid in divided dosage is usually adequate. Similarly, in children about 12 years of age who excrete around 1,200 to 1,500 cc. of urine, 12 Gm. of mandelic acid daily usually produces a urinary concentration of between 0.5 and 1 per cent. It is often necessary to use an accessory acidifier such as ammonium chloride in doses sometimes as high as from 2 to 8 Gm. daily to obtain the desired urinary p_H of 5.5 or less. It has been pointed out that mandelic acid therapy is ineffective in *B. proteus* infections. Similarly, one should not resort to the use of ammonium mandelate when one is dealing with organisms that liberate ammonia, like *aerobacter* or *pyocyaneus*. Sodium mandelate or calcium mandelate plus sodium acid phosphate are preferred in these types of infections.

Sulfanilamide, because it requires neither an acid ash diet nor restriction of fluid, and because it can be administered much more easily, is the choice of therapy in childhood except in the presence of infections due to *Streptococcus faecalis*, which are apparently resistant to sulfanilamide. The dose which we use in children is 0.2 Gm. per kilogram of body weight daily. We do not regularly use an alkaliizer because we have found that if the urine is not too acid the sulfanilamide is almost as effective at a p_H of 6 as at a p_H of 7. The simplest way to test the p_H of the urine, whether we are using mandelic acid or sulfanilamide, is by means of chlorophenol red or nitrozone paper.

Finally, in using both mandelic acid and sulfanilamide, the drugs should be given for a minimal period of ten days to two weeks, even when the urine clears more rapidly than this, because the pyurias are prone to recur with shorter periods of therapy.

DR. MODELL: I should like to add one thing: I have listed on the board but failed to discuss the properties of the ideal urinary antiseptic. I merely wanted to mention that there is no such substance.

Properties of the ideal urinary antiseptic are rapid absorption from the intestine, rapid and continuous elimination in the urine, that it shall be nontoxic and nonirritant for human beings, effective against all bacteria, effective in alkaline and acid urine, active in the presence of obstruction, that it shall act from the

renal pelvis down and that it shall be satisfactory in febrile states and in renal insufficiency.

DR. LEVINE: Dr. Traut, when you refer to the pyelitis of pregnancy, do you intend to imply disease of the renal pelvis alone?

DR. TRAUT: We just use it for old times' sake. We make the same objection to it that you do. However, we do not feel that we have as frequent involvement of the parenchyma of the kidney in the upper urinary tract infections in an adult woman as you would indicate was your experience with the chronic pyurias of children.

STUDENT: Are pyurias in children necessarily accompanied by parenchymal involvement?

DR. LEVINE: I did not mean to leave the impression without some reservation. In animal experimentation infections of the pelvis of the kidney have been produced in the absence of parenchymal involvement, but in the chronic pyurias and in many of the acute pyurias of childhood I think there is an associated pyelonephritis or a suppurative interstitial nephritis.

DR. JOHN E. DEITRICK: I should like to ask about the dosage of sulfanilamide when there has been involvement of the kidney. In a few cases, I have seen, in which there was decreased renal function, if one gave sulfanilamide the amount in the blood rose rapidly, even when a small dose was used. No mention has been made about determining the blood level, which I feel is important if a patient has an elevated urea nitrogen or other evidence of inability of the kidney to function normally. We have seen toxic symptoms and found the blood level very high, although we had not reached a dosage ordinarily used in an adult person.

DR. STEVENS: I do not recall that I have had reason to employ the drug in a case with as marked renal involvement as described, but I remember that one of the articles by Helmholtz records four or five patients with nonprotein nitrogen up around 50, 60, or even more, who excreted the sulfanilamide in large quantities, and that he obtained good clinical results in combating infections. The point has been made by various observers that one may expect more from that drug than from mandelic acid in individuals with poor renal function, as indicated by high nonprotein nitrogen or the high urea nitrogen in the blood.

DR. CATTELL: The universal distribution of sulfanilamide throughout all the cells and fluid of the body would suggest that it might be present in effective concentration as long as any urine was excreted.

DR. STEVENS: I think it has not been demonstrated how much of the efficiency of the drug in urinary infections comes from the excretion in the urine and how much comes through the body fluids. I did not mention the use of sulfanilamide in the treatment of gonorrhea; we did not have time for it. It has been found that as high a percentage of sulfanilamide may be found in the urethral pus as is found in the urine of the same individual, which I think is a very suggestive observation.

DR. HARRY GOLD: I notice that as urinary acidifying agents sodium acid phosphate and ammonium acid phosphate are being considered as interchangeable. I might call attention to the fact that a paper was presented at the federation last year in which a comparison was made between the urinary acidifying power of sodium acid phosphate and ammonium acid phosphate, and it was found that sodium acid phosphate in the usual

doses that are employed is much less effective as an acidifying agent than ammonium acid phosphate. Furthermore, ammonium acid phosphate is not very irritant to the gastrointestinal tract and can be used in very large doses, larger doses than sodium acid phosphate, without gastrointestinal symptoms.

DR. MODELL: There is a similar report by Alstead on the effect of ammonium acid phosphate, in which he stated that it was superior both to ammonium chloride and to acid sodium phosphate.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ABSTRACT AND APPRECIATION.

HOWARD A. CARTER, Secretary.

ABSTRACT OF MINUTES, MEETING OF COUNCIL ON PHYSICAL THERAPY, JANUARY 13-14, 1939

The Council on Physical Therapy held its annual meeting on Jan. 13-14, 1939, at the headquarters of the American Medical Association. The members present were Dr. Harry E. Mock, chairman, Drs. Anthony C. Cipollaro, William W. Coblenz, John S. Coulter, Arthur U. Desjardins, Walter E. Garrey, Howard T. Karsner, Frank H. Krusen, Frank R. Ober, Horatio B. Williams and Mr. Howard A. Carter, Secretary. Drs. Frank Dickson and Ralph Pemberton were unable to attend.

Dr. Mock was reelected chairman and Dr. Garrey vice chairman.

INTERFERENCE WITH RADIO COMMUNICATIONS BY ELECTROMEDICAL EQUIPMENT

A report was presented of an informal meeting held in New York, Jan. 9, 1939, at which representatives of the Federal Communications Commission and medical profession, specialists in the communication field and manufacturers of electromedical apparatus were present. It was the opinion of the committee reporting that a mutual understanding among the groups present had been reached. The committee reported that the engineers of the Federal Communications Commission and of the radio manufacturers demonstrated by the use of aural reception and television the effects of the interference of electromedical equipment. Although television has not been commercially practicable up to the present time, it was expected that television sets will be on sale during the summer and, in the opinion of the manufacturers of this equipment, interference by electromedical equipment might seriously retard the advancement of television. The members of the medical profession present at the meeting strongly emphasized the importance of electromedical equipment, especially electrosurgery in the treatment of cancer, diseases of the skin, and so on, and the use of medical diathermy in the treatment of those diseases in which internal heat is indicated.

Two solutions were proposed: (1) screening of the treatment room and (2) the allocation of radio bands or channels. The representatives of the radio industries felt that screening the treatment room was to be desired and that the cost might not be excessive. It was pointed out, however, by the physicians and manufacturers that the moving of surgical and medical diathermy equipment from place to place would be prohibitive and that the screening of an entire hospital or clinic would be almost impossible.

The alternative suggestion of allocating certain radio channels to the medical profession seemed to be the most suitable in view of the seeming impracticability of screening. The difficulty involved in the allocation of channels, however, seems to be that operating the equipment on a given frequency within certain toleration limits and keeping it on that frequency would increase the cost of the equipment. The Council was reminded that apparatus purchased and being used now would become obsolete unless time is allowed before regulations go into effect. The request, therefore, was made by the representatives of the medical profession that the same courtesy be shown to them as

was granted the owners of ships equipped with radio apparatus of the spark gap type. Ship owners were allowed eight years from a certain date to liquidate the apparatus and to substitute more modern equipment. The suggestion was made, therefore, that the users of electromedical equipment already sold be allowed eight years to realize on their investment and that the manufacturer be given at least two years in which to change over and make new types available.

The accomplishments of this meeting were (1) a frank discussion of the problems of interference, (2) a visual demonstration of radio interference in television, (3) a presentation of the importance of electromedical equipment as used by the profession and (4) a mutual understanding of the problem involved. A committee of the Council was appointed to continue the study of this problem in an endeavor to cooperate with the interested bodies.

SHORT WAVE DIATHERMY

The Council voted to retain as one of its requirements for the consideration and acceptance of short wave diathermy apparatus the submission of six observations of the heating effects in the human thigh as observed by a thermocouple inserted before and after a twenty minute application of each technic promoted by the manufacturer. Acceptance is to be granted only to apparatus for technics the evidence for which has been submitted.

Minor changes in the manufacture of short wave apparatus, for example change in style of cabinet, nonessential revision in circuit or the substitution of more powerful thermionic tubes, as indicated by the lamp load test provided the temperature of the transformer does not rise beyond the safety point, is not to be considered sufficient alteration in design to warrant thermocouple-thigh test data being submitted for reacceptance.

Fundamental changes in circuit, reduction of power output as determined by lamp load test, promotion of different technic of application, change of frequency and fundamental changes in conversion of electrical energy to high frequency are to be considered important changes in the apparatus to warrant the submission of six observations of the temperatures in the human thigh as observed by the thermocouple for each technic of application recommended or promoted. For a recommended technic to be accepted, the final average temperature after twenty minute application of high frequency electrical energy shall be at least 103 degrees Fahrenheit in the deep tissues of the superior aspect of the human living thigh.

ORTHOPEDIC APPLIANCES

A discussion of problems with relation to the Council's consideration of orthopedic appliances, i. e. corsets, belts, supports and shoes, resulted in adoption of a motion to the effect that these appliances would not be considered by the Council after Jan. 1, 1940. It was decided, however, to sponsor the publication of several informative articles on the subject of shoes, corsets, trusses and abdominal supports.

AUDIOMETERS AND HEARING AIDS

A review of the Council's work in the consideration of audiometers and hearing aids was presented, and after some discussion it was generally agreed that the Council will continue its consideration of audiometers without restriction of advertising until further study is made in the field. The Council will continue to consider hearing aids and prepare reports for publication in THE JOURNAL.

ROENTGEN RAYS

The Council discussed ways and means of continuing its consideration of roentgen ray apparatus. It was agreed that cooperation with other interested bodies would have to be secured before the Council could proceed with its investigations.

RADIUM AND RADON

It was pointed out that the House of Delegates had adopted a resolution presented by the Judicial Council at the annual session of the American Medical Association in 1938, condemning the practice of renting radium to unqualified physicians. The Council therefore adopted the following resolution:

WHEREAS, The Council on Physical Therapy has long been opposed to the practice of indiscriminate rental of radium or sale of radon by certain commercial firms and private physicians, who, possessing radium, undertake to supply radium or radon to any physician who may apply,

regardless of his special training and experience in its use, and who even furnish instruments and instructions without having seen or examined the patient, and

WHEREAS This constitutes the practice of medicine by mail or by telephone, and

WHEREAS Four years ago the Council on Physical Therapy passed a resolution condemning this practice but, when this resolution was submitted to the Board of Trustees of the American Medical Association for approval the Board of Trustees voted against it, and

WHEREAS During the past year, at the instigation of Dr Edward H Skinner (Kansas City) the House of Delegates of the American Medical Association passed an essentially similar resolution which had been presented by the Judicial Council and confirmed by the Board of Trustees, and

WHEREAS This action implies that, since the American Medical Association has officially condemned the practice the columns of THE JOURNAL (and indirectly the columns of most of the journals of the state medical societies) should be closed to any advertising that would tend to foster the practice, be it

Resolved That the Council on Physical Therapy is deeply gratified by and heartily approves the action of the House of Delegates of the Judicial Council and of the Board of Trustees. The Council stands ready to investigate the products reviewed the advertising and as part of its duty, make this information available to THE JOURNAL.

It was also agreed to arrange for the preparation of a series of Council articles on the dangers of the indiscriminate use of radium.

RESEARCH

The Council considers problems of merit in research and believes that there are a number of subjects of vital importance in the application of physical agents to the treatment of disease worthy of investigation, and that investigations of such subjects would lead to important contributions to the practice of physical therapy. During the year 1938, one grant was awarded for research.

EDUCATION

A lengthy report of the activities of the various Council members and consultants in this field was presented. It was suggested that articles be published during the coming year on the following subjects: spastic paralysis, peripheral nerve injuries, the abuse of medical diathermy, the injudicious use of radium, the use of corsets, abdominal belts and trusses, and the effect of ultraviolet radiation on the production of cutaneous cancer.

APPARATUS ACCEPTED, THE COUNCIL'S PUBLICATION

The members of the Council expressed the opinion that the use of diathermy and other methods of producing heat within the tissues is being greatly overrated and abused, and that too much emphasis is being given to machine therapy. The Council believes that the profession should be informed of these abuses by means of a Council article pointing out that other methods of physical therapy are of greater importance, for example the intelligent management of the patient, the proper use of therapeutic exercise, massage and hydrotherapy.

After some discussion concerning the booklet "Apparatus Accepted," action was taken to initiate a review of the booklet with the idea of revising it to increase the amount of information to the general practitioner concerning the value of the various accepted devices.

EXHIBITS

Plans for the exhibit at the annual session of the American Medical Association in St. Louis were considered.

Suggestions were also advanced concerning the Council's proposed exhibit on the management and treatment of lame backs. It was agreed that if such an exhibit is approved a film on this subject should also be prepared to be shown at the same time.

NOMENCLATURE AND DEFINITION

A report was made to the effect that work on the definitions is now being carried on and that considerable progress is being made in this line.

PRESENT STATUS OF PHYSICAL THERAPY

The committee assigned to revise the Council's report on the present status of physical therapy announced that work is progressing in this direction and that a report would be made available during the coming year.

AN APPRECIATION

The Council wishes to acknowledge with deepest appreciation the valuable assistance rendered by the following in connection with the work of the Council:

Drs. Fred Adair, M. Herbert Barker, H. C. Bazett, Robert Bennett, William Bierman, Earl Bond, Walter Boothby, R. C. Burt, A. J. Carlson, J. Marion Clampitt, Eliot R. Clark, Milton B. Cohen, Geza de Takats, Earl C. Elkins, F. H. Ewerhardt, G. K. Fenn, A. Bruce Gill, F. B. Gordon, Allan Hemingway, John S. Hibben, K. K. Jones, Louis Katz, Disraeli Kobak, Henry Laurens, Arno Luckhardt, George Miller MacKee, Gilbert Marquardt, Albert Martucci, C. O. Molander, Tell Nelson, John R. Pribble, E. M. Smith Jr., K. W. Stenstrom, Grant E. Ward, Francis Carter Wood and Mr. S. L. Osborne.

Artificial Limbs—Drs. Paul Steele and Philip Wilson and Messrs. William Herman, W. E. Isle, George M. Morris, J. V. Spiveak and James Waltz.

Audiometers and Hearing Aids—Drs. C. C. Bunch, George M. Coates, L. W. Dean, E. P. Fowler, Henry Hartig, Austin Hayden, Isaac Jones, Douglas Macfarlan, Horace Newhart, B. R. Shurly and W. P. Wherry.

Educational Work—Drs. Richard Dillehunt, Bernard Fantus, A. J. Kotkis, Richard Kovacs, Franklin P. Lowry and William Schmidt.

Ophthalmologic Devices—Drs. Francis Heed Adler, Charles A. Bahn, S. Judd Beach, William L. Benedict, Conrad Berens, Alfred Cowan, John Evans, Jonas Friedenwald, Sanford Gifford, Walter B. Lancaster, William H. Luedde, John MacNie and Clifford B. Walker.

Röntgen Ray and Radium—Drs. L. F. Curtiss, William E. Chamberlain, Arthur C. Christie, Edwin C. Ernst, Gioacchino Failla, Thomas A. Groover, Fred M. Hodges, George Winslow Holmes, John T. Murphy, Robert Reid Newell, E. P. Pendergrass, George Pfahler, U. V. Portman, Lauriston Taylor and J. F. Weatherman.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary

SOLUTION LIVER EXTRACT PURIFIED-LILLY.

—A sterile aqueous solution of liver extract purified preserved with 0.5 per cent phenol, containing 15 U. S. P. units per cubic centimeter.

Actions and Uses—Solution liver extract purified-Lilly is proposed for intramuscular injection in the treatment of pernicious anemia. See general article Liver and Stomach Preparations, New and Nonofficial Remedies, 1938, page 321.

Dosage—For the average patient in relapse, treatment may be instituted with an initial dose of 2 cc (30 U. S. P. units), or 1 cc (15 U. S. P. units) may be given on two successive days, then a weekly dose of 1 cc (15 U. S. P. units) may be given until the red blood cell count and blood hemoglobin have reached satisfactory levels.

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To prepare purified solution liver extract Lilly, livers from edible animals are ground directly into water, and the mixture adjusted to the isoelectric point (approximately pH 5.1 to 5.6). The mixture is then heated to coagulate proteins (approximately 80°C.) stirred for several minutes and filtered. The filtrate is reduced in vacuum to a small volume and enough 95 per cent alcohol added to produce a concentration of approximately 70 per cent. The precipitate which is formed is discarded and the filtrate reduced to a small volume much of the total solids remaining at this point is removed by treatment with ammonium sulfate, zinc sulfate and alcohol yielding a product which is highly potent and which contains only a small amount of solids. The final product is in the form of a water solution containing 0.5 per cent of phenol.

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SATURDAY, APRIL 22, 1939

TRAUMA AND DIABETES

The concept of traumatic diabetes virtually began with Claude Bernard's diabetetic puncture. In the earlier literature, which is fairly extensive, appears a report by Asher, who assembled 124 cases and concluded that one was not justified in establishing a causal connection between trauma and diabetes by pathologic changes and physiologic results. Traumatic neurosis was introduced by Ehstein in 1892. A traumatic origin of diabetes was recognized by von Noorden in 1898. In general, authors considered that traumatic diabetes actually existed and that it was a neurogenic diabetes due to trauma in the central nervous system.

Somewhat later Stern felt that clinical observations gave rise to doubts because of the possibility that diabetes was present before the trauma and because the diabetes following trauma is indistinguishable from the diabetes occurring otherwise. Lépine thought that trauma must be considered in 5 per cent of cases of diabetes although noting too the question of hereditary predisposition. Naunyn favored the idea of a traumatic factor and presented eight cases of his own in which diabetes occurred after trauma of the head as well as after noncerebral trauma and traumatic neurosis. Welz in 1915 emphasized that the probability of a relationship between trauma and the disease decreased in the symptom-free interval, placing the limit at from two to three years. As late as 1912 von Noorden still believed in the presence of acute glycosuria of nervous origin but felt that it was doubtful or even impossible that genuine chronic diabetes could persist as a result of a nervous disturbance without the pancreas being affected. Kausch denied the etiologic importance of trauma and raised the objection that in all the reported cases the disease existed before the trauma.

After the World War von Noorden pointed out that it had been an enormous tax on the nervous system, a mighty and terrible physical experiment which must clear up the question whether the notion of chronic neurogenic diabetes and so-called traumatic diabetes shall henceforth be reckoned with. Finally, he con-

cluded that the soldiers who incurred diabetes during the war took the field as men with masked diabetes, whose disease as a rule was merely accelerated. His opinion was shared by Albu, Gottstein, Umber and Hermann Strauss. Lenné differed, relating the disease to physical and psychic strain, but admitted that injuries and diseases have no essential influence on the appearance and character of the disease. Umber agreed with von Noorden and in 1927 declared that no experimental or clinical evidence existed that an injury to the brain, head, trunk or extremities could cause diabetes and that to explain the diabetes one must find diminution in the function of the pancreas. True traumatic diabetes could not be thought to appear unless the pancreas itself was severely injured, because experiments have shown that at least four fifths of the pancreas must be removed before diabetes appears. However, such severe trauma as a rule will lead to death. He considered that the aggravation of diabetes by trauma as a rule is negligible and that, in the majority of cases, it can be suppressed by adequate treatment; nor does it give rise to any persistent change in the future course. Later he emphasized the general hereditary disposition in 26.4 per cent of cases and cited Danforth to the effect that in cases of recessive heredity 72 per cent of the diabetic need not have any diabetic relatives, comprising siblings, parents and their siblings and grandparents, during three generations. Hence it will almost never be possible to exclude definitely the existence of diabetic genes. Umber agreed with von Noorden, who in 1923 stated unequivocally that neurogenic diabetes does not exist, the experiences of the war having put it completely in the grave.

Isaac acknowledges a causal relationship if the diabetes comes on within four weeks after the trauma and Grote agrees that a longer interim renders a causal relationship unlikely. Stern says that a causal relationship is probable only (1) if there are no indications of an earlier existence of diabetes, (2) if the accident has caused a lesion of the pancreas or the central nervous system and (3) if diabetes develops during the first weeks after the accident.

Examinations of the blood sugar were first mentioned in 1915. Dextrose tolerance tests were few and the results difficult to compare because of lack of uniformity. A cerebral concussion is more important in producing hyperglycemia than a cranial fracture.

Thomsen¹ has just made available the only monograph in English on this subject. He examined 100 patients with regard to spontaneous as well as alimentary hyperglycemia and glycosuria at the time of accidents. Blood tests were done on ninety-four of 100 patients, both during fasting and after administration of dextrose, within three days after the accident. His material consisted of 144 patients, forty-four of whom were not given dextrose tolerance tests. Age was important.

1. Thomsen, Viggo: Studies of Trauma and Carbohydrate Metabolism with Special Reference to the Existence of Traumatic Diabetes, Acta med. Scandinav., supplement 91, 1938.

Disturbances in carbohydrate metabolism immediately after the trauma are much more frequent under than over the age of 30, although they are more transitory in the young than in the old. While there are disturbances of carbohydrate metabolism in a considerable number of patients, the distribution of the types of physical trauma into groups shows that no decisive importance can be attributed to the kind and location of the trauma, whether cerebral, peripheral or otherwise, with regard to the frequency and intensity of the detected disturbances.

An increase of the fasting blood sugar was found in twenty-four cases, that is in 17.5 per cent of all the cases. Abnormal dextrose tolerance curves were obtained in thirty-four of 100 cases. In the majority the glycosuria was detected in the portions of urine voided shortly after admission. Sugar was thus found in twenty of thirty-four specimens. In isolated cases it persisted more than seven days; in one, after a sugar-free interim, it contained sugar on the fifteenth day. One patient had renal glycosuria. The glycosuria was usually slight; in only twelve cases was the value above 0.5 per cent. There was no polyuria. In ten cases in which dextrose tolerance tests were performed there was diabetes in the immediate family. Thomsen concluded that no importance could be ascribed to the disturbances of carbohydrate metabolism detected after trauma. The duration of such disturbances, even with the most persistent spontaneous hyperglycemia, based on the fasting blood sugar level, was five days. Dextrose tolerance curves were abnormal once or several times, but in twenty-four cases the abnormal curves were detected only at the first examination, performed within three days after the accident. Fifteen patients, reexamined from three to twenty-nine days after the trauma, presented normal conditions. In one case a disturbance of the carbohydrate metabolism was disclosed by an abnormal dextrose tolerance curve as late as forty-nine days after the accident, while two patients who presented abnormal curves after a lapse of thirty and forty-nine days respectively had a normal curve ninety-seventy and 144 days after the trauma. In none of the patients who survived the accident did diabetes occur in close sequel to it, and this must be supposed to apply also to those patients who died shortly after the accident. The duration of the disturbance in carbohydrate metabolism as well as its frequency was greatest in the higher age groups. In forty-seven of fifty cases a second examination was performed from six to thirty-eight months after the accident. In none of these had diabetes occurred, and in two of the remaining three nothing is known concerning the occurrence of diabetes up to three and one-half years after the accident. One patient was untraced.

To answer von Noorden's question as to whether diabetes is more frequent in persons who have met with accidents than in noninjured persons of the same age and standard of living, Thomsen investigated the

material of the district hospital in Aarhus, Denmark, where he was assistant physician. From 1921 to 1935 there was scarcely any difference in the frequency of diabetes in injured and noninjured patients of the same age and standard of life. Thomsen says that he has not seen the description of any case of existing diabetes in which trauma has been proved to have given rise to a permanent change in the degree and course of the disease. In his opinion the trauma, strictly speaking, cannot be incriminated for an indirect exacerbation of diabetes, such as is due to lack of exercise, change in diet, or to the accompanying infection, and such an exacerbation must be disregarded in order to afford an idea of a traumatic exacerbation proper of the diabetes.

From an analysis of 100 cases he finally concludes that in the case of existing diabetes trauma can give rise to an exacerbation, though of a temporary nature. Temporary exacerbation ensues in about half the cases. The exacerbation is independent of the kind and location of the trauma. It appears immediately after the accident and has an average duration of twenty-six days. His studies afforded no evidence that trauma gives rise to a later exacerbation of the disease. It very probably is able to provoke coma only in a predisposed person who has severe diabetes. The effects might be compared with those produced by a stone thrown into a brimful vessel, which it causes to flow over, and a stone thrown into another, not brimful, vessel, in which it merely produces a ripple on the surface of the water.

Does the course of diabetes which occurs or is exacerbated after trauma differ markedly from the course of similar conditions of metabolism? Thomsen points out that, it being so difficult to compare one diabetic person with another, it must be much more difficult to draw reliable conclusions as to whether the patient under consideration would present a different picture if the trauma had not occurred. He then assembles eighty-one cases in which trauma has been reported as a factor in the appearance of the diabetes. One would expect, he says, quoting Joslin, that the age at the onset of the disease would have been under 40 in 38 per cent and above 40 in 62 per cent, and, he asks, should the trauma give rise to diabetes sooner in the younger than in the older patients? Apparently of injured normal persons 72 per cent were below and 28 per cent above 40. Males in this group predominated, 85 per cent, females 15 per cent, instead of Joslin's 64 per cent of females among the diabetic generally. The onset was indefinite in 43.2, gradual in 37, rapid in 14.8 and sudden in 5 per cent. His conclusion is that reported "traumatic" diabetes usually occurs in younger persons, is to a considerable extent a disease of males and behaves in onset and course like ordinary diabetes. Thus with regard only to age and sex was a deviation from ordinary diabetes detected. This deviation depends not on any special mode of

reaction to trauma in young males but merely on the fact that such persons incur injuries with correspondingly greater frequency. Hence the detected deviation cannot be utilized for the assumption of an essential difference between so-called traumatic and ordinary diabetes.

The post-traumatic disturbances of the carbohydrate metabolism detected in human beings by Thomsen's investigations are brought about by reflexes via the sympathetic nervous system. He based this conclusion on tests with ergotamine and considered that these were substantiated by experiments reported on animals.

In the chapter "Does Traumatic Diabetes Exist?" he states that in human beings neither "experimental" nor clinical clues were found to warrant the assumption that post-traumatic sympathicogenic disturbances in the carbohydrate metabolism can lead to diabetes. His own investigations showed that the disturbances of carbohydrate metabolism were always transitory and that subsequent examinations did not reveal diabetes in any of the cases, and he asserts that "traumatic" diabetes does not differ from ordinary diabetes with regard either to existing disposition or to its mode of onset or further course. An examination of the histories of diabetic and nondiabetic persons of the same age and mode of living reveals no difference in the incidence of head trauma and that there is no reason to assume that diabetes is more frequent in injured than in non-injured persons. As to whether trauma can activate latent diabetes, he states that it is apt to cause an exacerbation of existing diabetes, but only a temporary exacerbation, and that there is no evidence of any subsequent exacerbation. Therefore physical trauma cannot be assumed to evoke latent diabetes, at any rate in any other way than that, after the cessation of the effects of the trauma, again one is dealing with latent diabetes. He admits that, theoretically, trauma is able to make a latent diabetic condition manifest. Since diabetes is of no greater incidence after trauma than after other surgical conditions necessitating hospitalization, there is no reason to consider traumas of greater importance as causal factors of the detected diabetes than the other surgical complaints. Pancreatic diabetes is the only form of diabetes the existence of which has been proved by animal experiments, wherefore it must be considered established that trauma giving rise to as extensive a destruction of the pancreas as that required by experiment will be followed by diabetes, and he considers that no such cases have been reported. He excludes Wells's case. He was not conversant with the case from Gräfe's clinic cited by Joslin. Thomsen's monograph was completed before the work of Young in London, who produced permanent diabetes experimentally by injection of pituitary extract.

This work, supported in part by the Norwegian Insulin Fund, is a real contribution to the problem of trauma in relation to diabetes.

FUMIGATION WITH HYDROGEN CYANIDE

Evidence of the superior efficacy of hydrogen cyanide as a fumigant for ships and houses has been rapidly accumulating. As this method becomes applied more extensively, the problems of toxicity and ventilation following use have received special study. After the employment of hydrocyanic acid gas as a fumigant for ships in the tropics, with the technic which has been developed, Gilles¹ states that the average time for clearance of the gas after fumigation has never exceeded six hours. At the expiration of four hours' continued ventilation, the holds and spaces are carefully tested with methyl orange or copper benzidine acetate test paper. When the fumigated space is found clear of dangerous quantities of gas, the crew is allowed on board and, under supervision, all pillows, blankets, mattresses and the like are brought out, hung and aired in the sun. Gilles does not report any toxic effects to the crew from this procedure.

Etteldorf² conducted accurate determination of the critical concentration of hydrocyanic acid on twenty-two dogs, seven rabbits, four guinea pigs, five white rats and four chickens and investigated whether the effective and recognized method of detoxification could be exhausted by subjecting dogs to single and repeated dosages of hydrocyanic acid for periods ranging up to eight and twelve hours. He also studied the antidotal and prophylactic value of methylene blue against gaseous hydrocyanic poisoning. The critical level for each species of animal was measured and demonstrated by the onset of convulsions. Below the critical level, hydrocyanic acid is sufficiently controlled for an unlimited time by the detoxifying mechanism of the animal. Evidence of tolerance or increased susceptibility was not obtained. Methylene blue had little value as treatment above the critical level of cyanide poisoning but was valuable as a prophylactic against these concentrations.

Perhaps the most important problem from the practical point of view is the method of ventilation following hydrogen cyanide fumigation. Page and his colleagues³ investigated this aspect in a series of careful observations in English houses of various types and age and under different weather conditions. Their conclusions in part were that all windows should be kept open for twenty-four hours after fumigation, unless this leads to the entry of rain or snow. A ventilation period of this length is generally sufficient for an empty house of normal construction, but a longer period may be required for a furnished house or for a house which is damp, which contains an unusual proportion of dead space or which contains rooms without windows providing adequate communi-

1. Gilles, Eric C.: Fumigation of Plague Suspect Imports in Colonies as a Means of Controlling Plague in the Island, *J. Roy. San. Inst.* 58: 76 (Aug.) 1937.

2. Etteldorf, J. N.: On the Detoxification of Gaseous Hydrocyanic Acid, *J. Pharmacol. & Exper. Therap.* 58: 431 (Dec.) 1936.

3. Page, A. B. P., and others: The Ventilation of Houses After Fumigation with Hydrogen Cyanide, *J. Hyg.* 39: 12 (Jan.) 1939.

cation with the open air. They conclude that fumigation of clothing, and particularly bedding, as a regular practice is undesirable. Further, upholstered furniture should be placed in a position to facilitate airing; the customary tests with benzidine acetate-copper acetate should be made (a blue color in all air spaces indicating a concentration of one one-hundredth or less per thousand cubic feet gives a margin of safety). If the house contains much absorbent material or if any other circumstances suggest that a period of twenty-four hours of airing may not be sufficient, all doors and windows should be closed after performing the tests with benzidine acetate-copper acetate and these tests should be repeated after the house has remained closed for two hours.

Supervision of fumigation is a public health problem. For example, in New York, fifty-three concerns hold permits to conduct the business of fumigation and extermination. From June 1, 1936, to June 1, 1937, there were, according to Oberwager,⁴ 353 fumigations performed in that city under the supervision of the sanitary bureau of the health department. In fact the New York regulations governing fumigations have been changed recently to provide for additional safeguards for the occupants of premises during and following fumigation.

Current Comment

THE ABORTIFACIENT AND OTHER EFFECTS OF THE URINE AND SERUM OF CANCEROUS PATIENTS

Elsasser and Wallace¹ recently reported that the urine and serum of patients with malignant tumors have a selective action on embryonal or newly growing tissue. The work began with the urine of a man with an embryonic cancer of the right testicle. Daily intravenous injections in pregnant rabbits of 20 cc. of urine produced abortion on the fifth day. The urine of patients with other tumors of embryonal nature—dysgerminoma of the ovary, teratoma of the testicle, Wilms tumor—produced abortion, as did "the urine of a large number of patients with other types of malignant tumors" (no further details are given). The blood serum of patients whose urine caused abortion also was effective. Control tests with the urine or serum of normal persons and of noncancerous ward patients gave negative results. Following the daily injections of urine from cancerous patients a progressive placental necrosis with infiltration of inflammatory cells occurred, with destruction of the embryo or expulsion in late pregnancy. In nonpregnant rabbits the injections of urine caused degeneration of the graafian follicles and sclerosis of the ovarian tissue; in male rabbits the

injections caused degeneration of the spermatogenic processes. In rats with implanted carcinoma (Walker 256) injection of urine from cancer patients was followed by necrosis of the carcinomatous as well as of newly formed blood vessels. Here it should be noted that the urine of pregnant women did not cause abortion in rabbits and neither did massive doses of anterior pituitary-like preparation² together with estrogenic hormone. Many problems arise from these interesting results which call for further work along various lines. The results of such work will be awaited with keen interest. Whether the principle has been discovered of a test of value in the early diagnosis of any kind of cancer remains to be determined.

RENAL CALCULI IN VITAMIN A DEFICIENCY

The occurrence of urinary calculi in rats fed on a diet deficient in the fat-soluble vitamins was first reported by Osborne, Mendel and Ferry.¹ Through numerous repetitions of this type of experiment the role of vitamin A in experimental urolithiasis has been recognized but the mechanism of stone formation under these conditions is not entirely clear. Thus the alkalinity of the urine excreted by rats on a vitamin A deficient diet has been related to stone formation by some investigators and the infection of the urinary tract resulting from vitamin A deficiency is believed to be an important contributory factor by others. A recent report of Steiner, Zuger and Kramer² on the production of renal and ureteral calculi in guinea pigs by feeding these animals a diet deficient in vitamin A is of particular interest as the alkalinity of the urine alone and infection of the urinary tract apparently did not have an important part in the development of the concretions. Large plaques of desquamated epithelial cells were found in the pelvis and ureters and it appears that these large plaques acted as niduses for the formation of calculi. There was no gross or microscopic evidence of infection in the urinary tract. The transformation of epithelial cells which has been recently dealt with by Wolbach³ was observed. The vitamin A deficiency caused hyperplasia, later metaplasia to squamous epithelium, and finally atrophy of the pelvic and ureteral mucosa. The observations of Steiner and his collaborators do not minimize the importance of improper mineral balance of the food, presence of infections in the urinary tract and excessive alkalinity of the urine, other factors which may be involved in the genesis of urinary calculi as a result of faulty diet. The detailed description of the part played by small pieces of epithelium in the production of calculi in the guinea pig in these particular experiments sheds more light on the etiology of urolithiasis, a subject which long has needed clarification.

2. Antuitrin-S.

4. Oberwager, John: Supervision of Fumigation and Extermination, *Am. J. Pub. Health* 28: 633 (May) 1938.

1. Elsasser, T. H., and Wallace, G. B.: A Selective Action of Urine and Serum from Patients with Malignant Tumors on Embryonal and Newly Growing Tissues, *Science* 89: 250 (March 17) 1939.

1. For references to the work in this field, see report of the Council on Pharmacy and Chemistry, Vitamin A and Urinary Lithiasis, *THE JOURNAL*, Dec. 14, 1935, p. 1983.

2. Steiner, Morris; Zuger, Bernard, and Kramer, Benjamin: Production of Renal Calculi in Guinea Pigs by Feeding Them a Diet Deficient in Vitamin A, *Arch. Path.* 27: 104 (Jan.) 1939.

3. Wolbach, S. B.: The Pathologic Changes Resulting from Vitamin Deficiency, *J. A. M. A.* 108: 7 (Jan. 2) 1937.

ORGANIZATION SECTION

THE WAGNER BILL

AN ANALYSIS OF THE WAGNER NATIONAL HEALTH BILL OF 1939

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Just a few weeks ago—on February 28, to be exact—the senior Senator from New York, Hon. Robert F. Wagner, introduced in Congress a measure of far-reaching importance to the people of the United States and particularly to the people of the South. This measure, known as the National Health Act of 1939, has been referred to the Senate Committee on Education and Labor and is now awaiting action by that committee and later by the two houses of Congress.

The chief purpose of this measure, as described in its preamble, is "to provide for the general welfare by enabling the several states to make more adequate provision for public health, prevention and control of disease, maternal and child health service, construction and maintenance of needed hospitals and health centers, care of the sick, disability insurance," and so on.

More specifically, the measure makes use of the sound procedure of grants-in-aid to the various states, which provides a wide latitude to the individual states in the development of their own health plans, conditioned by the particular health problems of greatest importance to their own people. Such grants-in-aid are provided for the purpose of establishing, expanding and improving state programs in the fields of child and maternal health, general public health services and investigations, construction of hospitals and health centers in communities where they are most needed, general medical care, and insurance against loss of wages and salaries during periods of temporary disability. Administration of the act, if it is passed in its present form, will become the responsibility of three already established federal agencies: the Children's Bureau, the United States Public Health Service and the Social Security Board. In discussing the bill at the time of its introduction, its sponsor declared that "the fullest development of this program would bring the benefits of modern medical science, both preventive and curative, within the reach of all groups of the population, especially in rural areas suffering from economic distress." In view of the fact that such a large percentage of the people of the South are residents of rural sections and the even more significant fact that they rank extremely low in per capita wealth, the National Health Act of 1939 promises to make available to the people of this state a degree of medical, nursing and hospital care never known in the past.

It has been pointed out that under no circumstances will the federal government undertake to furnish medical care. Administration in all cases, except of course in the matter of the necessary federal allocation of funds and insistence on states complying with the proper standards of performance, will be through the states, which will formulate their plans on the basis of local needs, conditions and problems. No attempt

will be made to displace existing activities with new ones, although naturally these activities will be able, with additional funds, to expand and to operate much more effectively.

No system of health insurance is contemplated in the bill as a function of the federal government, nor is any participating state required to institute such a system. In that section of the measure dealing with a general program of medical care (title XIII) the states will be at complete liberty to develop, under the inspiration of local needs, conditions and problems, the types of medical care programs they peculiarly need, subject of course to the proviso that the programs devised must square with certain basic standards to be set by the three federal agencies that have been mentioned. The general program of medical care which a particular state may formulate as best for its own people may be limited, at the discretion of its officials, to persons on relief or, again at their discretion, it may be broadened to include those of nonrelief status. It may be financed entirely by insurance contributions, from tax funds or from both. The method and scope of medical services to be provided likewise are to be determined by the proper officials of the state concerned and, of course, these services may be provided by private agencies and institutions already in operation, if that is desired. Provision is wisely made for the training of personnel employed to provide these services, and such personnel must be selected on a merit basis.

An important aspect of the bill which should not be lost sight of is the absence of specific detail for operation incorporated into the basic law. Such specificities would have destroyed the autonomy of states in the effort of each to work out its own salvation in a yet uncharted field.

The act carries appropriations totaling approximately \$80,000,000 for the first year, exclusive of such sums as Congress at its discretion may appropriate for aiding the states in the construction of needed tuberculosis sanatoriums and mental hospitals, with increases from year to year over a ten year period. Under its terms federal appropriations would be available for the matching of sums appropriated by the individual states as their share of the cost of their own health programs. The measure carries no authorization of new federal payroll taxes.

In order to accomplish one of the main purposes of the measure, namely the aiding of economically impoverished communities in their efforts to provide needed hospital, medical and nursing care, the measure stipulates that the federal funds appropriated to put it into effect are to be allocated to the several states on a variable matching basis, the amount to be received by a particular state depending on that state's relative financial resources, as determined by the per capita income of its

population. Thus the bill is intended by its sponsor and supporters to "raise the general level of health protection throughout the country, while reducing the existing wide variations among the states, and especially as between rural and urban areas."

In addition to the health services in the preventive and curative fields already mentioned, the bill provides grants-in-aid to the states to be used in setting up insurance plans by means of which cash benefits may be made available during periods of temporary disability. Such systems would be so devised as to provide the greatest possible protection to the American wage earner against wage loss resulting from such disability, which loss is estimated at more than a billion dollars a year. Thus systematic insurance payments would insure the continuance of workers' incomes through those periods when they are most needed.

The National Health Act of 1939 is not intended to transform the United States into a utopia in health matters overnight. However, it was framed and introduced in the hope and belief that it would bring the blessings of health protection to multiplied millions of our people whose need for such protection is no less great because as a result of their financial status they have not been able or, at best, have been only partially able, to finance it in the past.

BUREAU OF MEDICAL ECONOMICS

The article by Dr. J. N. Baker was submitted to the Bureau of Medical Economics of the American Medical Association, which submits the following comment:

The basic questions raised in connection with the Wagner bill are probably the following two: first, whether the proposed appropriations for the various purposes are suitable to the needs; second, whether the bill, by extending federal help or subsidies, is intended to encourage the establishment of sickness insurance systems by states.

This discussion appears to assume that the federal allocation of funds will actually be made "through the states, which will formulate their plans on the basis of local needs, conditions and problems."

It also states that "no system of health insurance is contemplated in the bill as a function of the federal government," which is probably a correct statement. But, if federal subsidies are to be used to encourage states to adopt such plans, then it is to that extent a sickness insurance bill providing for partial support by the federal government.

Is "the absence of specific detail for operation" in the basic law wholly desirable if the effect of the law is to subsidize plans the "specific detail" of which would be determined largely by the federal authorities?

BUREAU OF LEGAL MEDICINE AND LEGISLATION

Dr. Baker's statement was submitted also to the Bureau of Legal Medicine and Medical Legislation, which submits the following comment:

Dr. Baker's analysis is entitled to careful consideration not only because of his professional and official standing but also because it presents a view of Senator Wagner's proposed amendments to the Social Security Act that seems to be based largely on local considerations and on economic conditions that every one hopes are only temporary.

The bill introduced by Senator Wagner, S. 1620, is described in its title as "A Bill to provide for the general

welfare by enabling the several States to make more adequate provision for public health, prevention and control of disease, maternal and child health services, construction and maintenance of needed hospitals and health centers, care of the sick, disability insurance, and training of personnel; to amend the Social Security Act; and for other purposes." Of this bill, Dr. Baker says:

In view of the fact that such a large percentage of the people of the South are residents of rural sections and the even more significant fact that they rank extremely low in per capita wealth, the National Health Act of 1939 promises to make available to the people of this state [Alabama] a degree of medical, nursing and hospital care never known in the past.

To accomplish this result—

... the measure makes use of the sound procedure of grants-in-aid to the various states, which provides a wide latitude to the individual states in the development of their own health plans, conditioned by the particular health problems of greatest importance to their own people.

The arguments advanced by Dr. Baker in support of the amendments to the Social Security Act, proposed by Senator Wagner, have a certain degree of validity. They must be weighed, however, in the light of his status as the health officer of a great state, but a state whose people happen just now to be in financial distress and in need of help. Speaking for the country over, one might reply to Dr. Baker's arguments along the following lines:

The term "grants-in-aid" implies that the federal government will pay to the several states, or to some of them, money to aid in carrying on certain intrastate activities. Such a grant, however, is generally made only on condition that the state appropriate state funds to help defray the cost of such activities and always on condition that it submit to certain conditions imposed by the federal government, including the supervision and control of the work by federal officers. Waiving all question as to the essential soundness of such federal grants, in a country such as ours, organized under a constitution carefully designed to preserve the rights of the several states from infringement by the federal government, a brief examination of the operation of such grants seems to show not only that the underlying principle is essentially unsound but also that, instead of enabling the several states to make more adequate provision for public health and such other activities described in the caption of the Wagner bill, they tend to limit the ability of many states to do so.

In the first place, we must ask where the federal government is to obtain the money wherewith to pay such grants-in-aid as are proposed in this bill. The federal government cannot create money and it must get it somewhere. It can get it only by taxation, and the ultimate consumer pays the price in the cost of living. Conceivably it might abandon governmental activities already under way and apply to the new projects proposed by Senator Wagner the money thus saved. On the other hand, it might and presumably will levy additional taxes if the bill should be enacted.

No proponent of the Wagner bill has even as much as suggested that any federal activity now under way be curtailed or abandoned to provide the funds necessary to pay the federal share of the expenses of the activities proposed by Senator Wagner. The abandonment of any such activity, however, would still leave the cost to be paid out of the taxes thereby rendered unnecessary and which might be discontinued but for the enactment

of this bill. It is generally assumed, however, that the money for the federal share of the expenses of the proposed activities will be provided by additional taxes, if the bill is enacted. As the bill now stands, it does not propose to levy additional taxes in the form of federal payroll taxes or specific taxes of any kind, having direct reference to the expenses of this legislation; for any proposal to levy taxes for that specific purpose would bring to the attention of the taxpayers of the country the cost of the pending bill and probably insure its defeat. The needed money, therefore, must presumably be raised by increasing the rates at which some of our existing taxes are levied or by imposing new general taxes of some kind, and the taxpayer, even though he may complain of the increase in taxation, will not be able to associate the increase with the cost of this bill. And the primary taxpayer—that is, the taxpayer who pays the money directly into the federal treasury—will whenever he can pass the tax along and sooner or later it will rest on the back of the ultimate consumer, whose ability to maintain himself and his dependents will be decreased in proportion to the increase in taxation.

But that is not all. Grants-in-aid given by the federal government will generally have to be matched wholly or in part by money provided by the several states to which such grants are made. The state accepting a grant-in-aid will find itself, therefore, in the same position as that of the federal government; it will have to curtail or discontinue present activities and public benefits in order to obtain the money wherewith to meet the federal grant or else will have to increase state taxes. If the state activities curtailed or discontinued are essential to the public welfare, the public will suffer. If new taxes are imposed or the rates of taxation with respect to old taxes increased, the increase in the tax burden will reach the ultimate consumer, with corresponding further increase in his cost of living and with further diminution in his ability to provide support for himself and his dependents.

There is another aspect of the grant-in-aid system such as Senator Wagner's bill proposes that is seldom recognized. Even though it may enable some states to make more adequate provision for projects covered by the act, it lessens the ability of other states to do so. With respect to states in the latter class, so-called grants-in-aid are not "in-aid" but are only the return by the federal government to the state of money taken from its people through federal taxation, directly or indirectly, and even that return is made only on condition that the state submit to the determination by the federal government as to the purposes for which it shall be spent and federal supervision and control of the state agencies employed to accomplish those purposes. The amount returned to a state in this category is less than the amount taken from it by the federal taxation and is equal to only the remainder of the federal taxes collected from the people of the state, after the federal government has deducted such amounts as it deems necessary to provide federal subsidies for other states. To the extent that the grant-in-aid payable to any state is less than the money collected from the people of the state by the federal government for the purpose of providing such federal subsidies in general, the ability of that state to provide for its own people is diminished.

If the distribution of federal grants-in-aid was made according to the actual necessities of the several states, as determined by a fair and open study of the situation, there could be little or no objection to them. No one

would object to the making of grants of public money to relieve distress in any state that the state itself was financially unable to relieve, but the idea of making such grants even to the richest and most prosperous states in the Union is hardly compatible with the hypothesis on which the making of such grants is popularly believed to be based. Appropriations have been made by the federal government without criticism or complaint for the direct relief of suffering even in foreign countries, and certainly no criticism has been or will be voiced in making appropriations for such relief in this country. But when the federal government levies taxes on persons in states not in need, in excess of the requirements of the states that are in need, and then returns the excess thus collected to the state from which it was collected but only on condition that the state subject certain intrastate affairs to the supervision and control by some federal appointive officer, the entire plan savors strongly of an effort to concentrate power in Washington at the expense of the states.

Dr. Baker points out that the pending Wagner bill to amend the Social Security Act, if enacted, will make available to the people of Alabama a degree of medical, nursing and hospital care never known in the past. If there is actual need for a degree of medical, nursing and hospital care in Alabama that has never been known in the past, and if the state of Alabama is unable to provide it, by all means let it be provided. But even if such a need is shown in Alabama and in some other states, but not in all, that fact does not justify imposing on all states the system of federally subsidized and controlled relief that may be necessary in Alabama and other states similarly situated. Certainly some states are able to look after their own people, without federal grants-in-aid and federal supervision and control. It may be claimed, of course, that the federal government must deal with every state on an equal footing, although there is no such requirement in the constitution; but, as has already been pointed out, grants-in-aid such as are proposed by the Wagner bill do not operate uniformly on all states. They place all states equally under federal supervision and control, it is true, but they result in the taking of money from the people of some states for distribution among the people of other states, thus lessening the financial resources of the states from which the money was taken in the first instance for the benefit of other states. The plan seems to be devised for the redistribution of wealth among the states. How far it may go toward promoting a spirit of complaisant dependence among the states, no one can foretell.

Dr. Baker emphasizes the fact that—

No system of health insurance is contemplated in the bill as a function of the federal government, nor is any participating state required to institute such a system. . . . The general program of medical care which a particular state may formulate as best for its own people may be limited, at the discretion of its officials, to persons on relief or, again at their discretion, it may be broadened to include those of nonrelief status. It may be financed entirely by insurance contributions, from tax funds or from both. . . .

In addition to the health services in the preventive and curative fields already mentioned, the bill provides grants-in-aid to the states to be used in setting up insurance plans by means of which cash benefits may be made available during periods of temporary disability.

While Dr. Baker's statement concerning health insurance is strictly correct, it hardly gives a true picture of the purpose and effect of the bill so far as health insurance is concerned.

The bill authorizes appropriations for grants to states for medical care amounting to \$35,000,000 and of \$10,000,000 for temporary disability compensation for the fiscal year ending June 30, 1940, and for unlimited appropriations thereafter. To obtain grants from the appropriation for medical care, a state must have submitted to the Social Security Board state plans satisfactory to that board, extending and improving medical care. Nothing in the bill limits this proposed medical care to indigent persons or even to persons of moderate means. Nothing in the bill defines the particular type of medical service that is to be provided. The Social Security Board seems to be at liberty to refuse to approve any state system that does not meet its ideas of social economics. It may refuse to approve any proposed system unless it provides for the distribution of medical service by a salaried state staff. It may refuse to approve any system that does not provide for medical service with free choice of physicians, paid on a fee basis. On the other hand, it may refuse to approve any system that is not based on strictly insurance principles, even with state payroll taxes and the usual accompaniments of health insurance. Any such system may possibly be styled a "state" system, but in order to obtain the federal subsidy it must have the approval of federal officers and in last analysis such a system is a "federal" system or at most a "federal-state" system.

Dr. Baker's statement that the insurance plans proposed in the Wagner bill to provide temporary disability compensation for persons temporarily disabled by illness or injury provide for cash benefits is incomplete, for the bill expressly provides that the Social Security Board "shall not approve the plan of any State which does not have a plan or plans approved under this Act under which the Board finds that reasonably adequate

medical services, including preventive services, are available to minimize disability among those covered under the State plan for temporary disability compensation." This necessarily implies the setting up by the state of a medical service of some kind to care for persons who are temporarily disabled and who are entitled to the benefits under the state plan. Nothing in the bill limits the beneficiaries of a state system of disability compensation to employed or even to employable persons. In fact, the bill expressly provides that disability, to be compensable, shall not have arisen out of or in the course of employment. Here certainly we have the germ of a full-fledged system of health insurance. When considered in connection with the provisions of the bill that authorize federal subsidies for state systems of medical care (which is defined to include all services and supplies necessary for the prevention, diagnosis and treatment of illness and disability) the provisions relating to disability compensation seem to leave the entire matter of health insurance throughout the entire United States to the judgment of the Social Security Board rather than to Congress, where it belongs.

Nothing in what is here written is intended in any way to reflect on the officers who are now charged with administering federal laws authorizing federal grants-in-aid, but officers come and officers go, and what an officer feels today with respect to governmental operations in the field of social economics and the administration of state aid is not necessarily what another officer will feel tomorrow. As a matter of fact, the people of the country have the right to have such matters determined by law and not by the mere judgment of individual federal executive officers.

GRADUATE MEDICAL EDUCATION

A PROGRESS REPORT OF THE FIELD STUDY ON GRADUATE MEDICAL EDUCATION IN THE UNITED STATES
BEING CONDUCTED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

LOUISIANA

In August 1936 a conference was held between representatives of the Louisiana State Medical Society and the Louisiana State Board of Health to outline a graduate program in obstetrics and pediatrics for physicians practicing throughout the state. It was proposed that the state society's committee on post-graduate education, which consists of five members with Dr. J. S. Kopfler as chairman, would act as the executive agency. On this committee is a member of the committee on maternal welfare and a member of the committee on medical education of the state medical society, together with the director of the Division of Maternal Child Health of the Louisiana State Board of Health. The professors of obstetrics in the two medical schools in the state outlined the educational program in obstetrics, and the professors in pediatrics actively participated in organizing the instruction in their special field. The expense of these courses was met with federal funds allocated to the state board of health.

Each course consists of five two hour sessions during one week. Teaching centers were selected in each of the eight councilor districts of the state. The district committee of from three to five physicians, including the district councilor, has charge of local arrangements and publicizes and assumes responsibility for the success of the graduate program in each district. Announcements are mailed to all physicians in the parishes of the district, and notices are published in the *New Orleans Medical and Surgical Journal*. The course as outlined includes lectures illustrated with movies, round table conferences, consultations on request and manikin demonstrations. Two in state

lecturers are chosen for each locality by the state society's committee, one an obstetrician and one a pediatrician. Lecturers receive \$25 a day, plus traveling expenses. Attendance records are kept by a member of the local committee. There is no registration fee.

From October to December 1936 instruction in obstetrics was given in nine towns. From twenty to forty physicians in each section attended. The auditorium of the city hall or the court house was used as a meeting place.

From December 1937 to December 1938 courses were given in obstetrics in ten towns and in pediatrics in fourteen towns in eighteen parishes of the state. Ten obstetricians and ten pediatricians have constituted the faculty. Two hundred and seventy-five physicians have attended the obstetric meetings and 407 have attended the sessions in pediatrics. Obstetric clinics have been held in six places where patients could be obtained for teaching. Six other parishes have selected pediatric courses, and it is planned that the state will be covered by the early part of 1939. All physicians of Louisiana have had an opportunity to avail themselves of this training. There are 1,324 members of the state medical society of the 2,200 physicians practicing in the state.

The Tulane University of Louisiana School of Medicine Department of Graduate Medical Studies was reorganized and its activities expanded in June 1937. All graduate medical education is now conducted under the supervision of the director of medical studies, Dr. H. W. Kostmayer. The faculty includes members of several departments of the school of medicine, and the facilities of the school are available to graduates who enroll

for study. The department has a budget, part of which provides instructors with compensation for the special intensive courses they give to graduates. Expenses of administration are charged against the graduate department's budget, but the use of the school's teaching facilities otherwise is not charged against this department.

The division of medical extension was created in 1937 and a full time assistant professor in the medical school was appointed as director. The medical extension division was organized for the purpose of conveying graduate instruction to those physicians who are unable to engage in formal study in medical centers. This division is supported largely by the Commonwealth Fund of New York, while Tulane University, the Mississippi State Medical Association and the Mississippi State Board of Health together provide approximately one fourth of the total budget. Fees from practicing physicians added an additional 5 per cent during the first year. Slightly more than half of the total expense during that year was allotted to administration and the remainder to instruction, including the travel expenses of instructors.

As now organized, the department of graduate medical studies offers several types of instruction to medical graduates: (1) a program for those who register in the graduate school of the university for advanced study in clinical divisions leading to advanced degrees after two or three years of residence; (2) fellowships in courses of study of one or more year's duration not leading to a degree—such courses are adaptable to the requirements of the specialty boards and may include instruction in the basic sciences; and (3) short, intensive courses in restricted fields such as cardiology, urology and dog and cadaver surgery. Applicants for these courses must have some preliminary training.

Intramural review courses designed for practicing physicians cover the general fields of medicine, surgery, gynecology and obstetrics. Instruction begins each January and continues for two periods of six weeks each, the second being a continuation of the lectures, clinics and demonstrations given in the first period. In these courses most of the morning instruction is given at the bedside of patients, although graduate students have no case responsibilities. The schedule provides for general review courses, one in medicine, one in surgery, including orthopedics and urology, one in gynecology and obstetrics and one in routine laboratory procedure. The latter includes clinical microscopy and requires about two hours each day. The fee for the first six weeks' course is \$100 and for the succeeding six weeks \$50. No diploma-like certificate is issued. Attendance averages from twenty-five to thirty physicians in medicine, from fifteen to twenty in surgery and from twelve to fourteen in gynecology and obstetrics.

An annual clinical conference of one week's duration is held each fall at the medical school, for which a fee of \$5 is charged. One hundred and twenty-two registered last session. Other special review courses are available to medical graduates. The total registration for intramural courses in 1937-1938 was 212.

The activities of the division of medical extension in Mississippi have been reported previously.¹ The division acts as the organizing and disbursing agency in Mississippi's statewide program and cooperates with the medical, health and hospital organizations of the state. A course in syphilology and dermatology now in progress utilizes two instructors from the medical school. A six lecture course in minor surgery is to begin in January 1939 with four instructors from the medical school as speakers. Instruction is largely didactic, although clinical material is used whenever available.

A similar extension program in internal medicine starts in April 1939 in Alabama under the joint auspices of the Medical Association of the State of Alabama, the Alabama State Department of Health and the division of medical extension. Circuits of five towns are planned with the instructor visiting each teaching center one day a week for seven times. Approximately twenty or twenty-two centers will be established during the first year. A field organizer will precede the instructor and with the cooperation of the medical association's committee on post-graduate study will obtain the cooperation of local medical societies. A registration fee of \$5 will be charged, but since

the instructional expense will exceed the amount of this fee donations from the medical and health organizations in Alabama and the Commonwealth Fund of New York will be utilized.

The Graduate School of Medicine of Louisiana State University Medical Center was organized in 1936 when Dr. James T. Nix was appointed dean. The faculty and facilities of the medical center are at the disposal of the graduate school. Three types of intramural instruction have been offered: (1) general review courses designed for practicing physicians, (2) review courses in medicine and in the medical specialties and (3) review courses in surgery and the surgical specialties. In January and February 1938 eight such courses were offered for periods of from two to six weeks. A fee of \$100 a month is charged non-residents of the state for scheduled short review courses, while residents of Louisiana are charged one-half this amount. In addition, personal courses are arranged according to the needs of individual physicians.

Extramural instruction is being given throughout Louisiana in the form of seminars by groups of the faculty of the graduate school of medicine in cooperation with the general extension division of Louisiana State University. The first of these was held at the Lafayette Charity Hospital, Lafayette, La., Dec. 2 and 3, 1938. Twelve members of the faculty participated in the afternoon and evening meetings, which included a clinical pathologic conference. A registration fee of \$1 was charged. More than 100 physicians attended. Similar programs designed for practicing physicians are projected in charity hospitals in three other towns of the state.

A special course in diagnosis, treatment and control of the venereal diseases was given at the medical center of Louisiana State University in cooperation with the United States Public Health Service, the Louisiana State Board of Health and the Department of Public Welfare of the City of New Orleans for a period of six weeks beginning Nov. 15, 1938. The attendance was limited to twelve physicians. Didactic instruction with clinical and laboratory experience, conferences and field studies was included.

The Louisiana State University Medical Library offers practicing physicians of the state a library service which includes the compilation of bibliographies. The only charge made is for postage on packages lent by the library.

The New Orleans Graduate Medical Assembly was organized in 1937 by a group of 150 physicians of the Orleans Parish Medical Society. These New Orleans physicians guaranteed the success of the four day assembly, which is held during February or March of each year. Lectures, dry clinics and round table discussions are conducted in a local hotel by eighteen out of state speakers. Louisiana physicians participate also, especially in the scientific exhibits. A registration fee of \$10 is charged, while commercial exhibits aid in paying the travel expenses of speakers. Announcements are sent to physicians in thirteen Southern states and notices appear in state medical journals. In 1937, 632 physicians registered, 474 from Louisiana, with nineteen states and the District of Columbia being represented. In 1938, 610 physicians registered, 529 from Louisiana and the remainder from twenty other states.

A Feat of Giant Memory.—Diagnostic knowledge and ability is the first essential of good practice; it therefore becomes in teaching hospitals the most direct and universal measure of medical learning; it is the stepping-stone to personal success. Its highly competitive character is mainly responsible for the atmosphere of intenseness in these institutions. . . . But, from our present standpoint, it lends an exaggerated importance to knowledge of numerous rare diseases, of newly described phenomena of minor interest, and of newly described methods and tests. A desire for encyclopedic knowledge is fostered and grows; it moves in the direction of detail, for the phenomena studied are of great complexity and diversity, and present few of those connecting links in the form of principle or generalization that would serve to lighten what otherwise becomes a feat of giant memory. The result of this system is the loss of much that is of value in the earlier training.—Lewis, Sir Thomas: Research in Medicine and Other Addresses, London, H. K. Lewis & Co., Ltd., 1939.

¹ Graduate Medical Education: Mississippi, J. A. M. A. 110:226B (May 28) 1938.

OFFICIAL NOTES

RADIO BROADCASTS

The radio broadcasts by the American Medical Association and the National Broadcasting Company, under the title *Your Health*, continue as previously announced each Wednesday over the Blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 o'clock mountain time, 11 a. m. Pacific time).

Starting April 30, daylight saving time takes effect in Chicago. The program will therefore be broadcast at the same hour Chicago daylight saving time, which means one hour earlier central standard time, two hours earlier mountain time and three hours earlier Pacific time. In communities where daylight saving time is in effect there will be no change in the hour of the broadcast.

Owing to network conflicts the Chicago broadcast does not occur at 1 o'clock Wednesday but there is a rebroadcast from a recording over station WENR at 8 o'clock each Monday evening, on and after May 1 (8 o'clock Chicago daylight saving time, 7 o'clock central standard time). The program broadcast each Monday is identical with the network program of the preceding Wednesday.

It has been necessary to curtail the length of the series by omitting the last two programs, which would have been broad-

cast June 14 and June 21. The series, therefore, will end with the broadcast scheduled for June 7.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

- April 26. What Is a Doctor?
- May 3. Healthier Mothers.
- May 10. The Doctor's Workshop.

THE ST. LOUIS SESSION

Special Radio Programs

Radio programs have been arranged in connection with the annual session of the American Medical Association in St. Louis.

Dr. Irvin Abell, President of the Association, will broadcast over the Blue network of the National Broadcasting Company, Monday, May 15, from 4:15 to 4:30 p. m. central standard time. Dr. Rock Sleyster, President-Elect, will broadcast over the Columbia Broadcasting System, Monday, May 15, from 3:45 to 4 p. m.

Dr. W. W. Bauer, Director of the Bureau of Health Education of the American Medical Association, will broadcast over the Blue network of the National Broadcasting Company Friday, May 19, from 4:15 to 4:30.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 1899 has passed the Senate, providing for the detail of a commissioned medical officer to serve as assistant to the Surgeon General of the United States Public Health Service. S. 1582 has passed the Senate, proposing to authorize the President to bestow a Meritorious Service Medal on any civil officer or employee of the United States, including commissioned officers of the Public Health Service, for the performance of an outstanding act or service involving great physical bravery or heroism, or for the performance of a service to the government or to humanity characterized by exceptional merit and involving a high degree of labor or effort above and beyond the ordinary and usual requirements of his office.

Bills Introduced.—S. 1744, introduced by Senator Reynolds, North Carolina, proposes to direct the Secretary of the Treasury to pay to Bernarr Macfadden the sum of \$2,000 together with interest at the rate of 6 per cent per annum from Nov. 11, 1907, in full satisfaction of his claim against the United States for a refund of the fine paid by him as the result of his conviction on Oct. 22, 1907, in a United States district court for mailing certain issues of the magazine entitled *Physical Culture*, which contained "certain allegedly obscene matter." S. 1964, introduced by Senator Wagner, New York, proposes to authorize national banking associations to contribute to community funds or to charitable, philanthropic or benevolent instrumentalities conducive to public welfare such sums as its board of directors may deem expedient and in the interests of the association. H. R. 4923, introduced by Representative Geyer, California, proposes to provide for the forfeiture and seizure of matter sent through the mails relating to contraception, abortion or matter designed, adapted or intended for any indecent or immoral use. H. R. 5272, introduced by Representative Dunn, Pennsylvania, proposes to amend the Social Security Act so as to enable each state to adopt its own interpretation of the phrase "needy individuals who are blind" as used in the act. H. R. 5284, introduced by Representative Merritt, New York, proposes to authorize an appropriation of \$1,875,000 to construct a 600 bed capacity veterans' hospital to accommodate general medical and surgical patients. H. R. 5379, introduced by Representative Smith, Ohio, proposes to amend the Federal Food, Drug and Cosmetic Act so as to relieve from certain of the labeling requirements of the act any

"drug dispensed by a physician for the treatment of asthma and hay fever where such drug shall have been exclusively dispensed by physicians for at least ten years prior to June 25, 1939." S. 2093 and S. 2140, both introduced by Senator Bone, Washington, propose to permit federal income taxpayers to deduct in connection with their income taxes amounts not in excess of \$250 paid during the taxable year for medical, dental, surgical or nursing treatment or hospitalization. H. R. 5134, introduced by Representative Dunn, Pennsylvania, proposes to amend the Social Security Act so as to authorize assistance to blind individuals whether or not the state plan extends only to those blind individuals whom the Social Security Board considers to be needy. H. R. 5475, introduced by Representative Gehrmann, Wisconsin, proposes to prohibit the importation of dairy products produced from milk or cream other than from cows either accredited free of bovine tuberculosis and Bang's disease or under test for such diseases. H. R. 5519, introduced by Representative Anderson, Missouri, proposes to confer certain benefits on commissioned officers and enlisted men in the Army, Navy, Marine Corps, Coast Guard, Geodetic Survey or Public Health Service of the United States who are placed on the retired list for physical disability incident to flying duty. H. R. 5577, introduced by Representative Izac, California, proposes to authorize an appropriation of \$950,000 to construct and equip a marine hospital at San Diego. H. R. 5630, introduced by Representative Lea, California, proposes to amend the Federal Food, Drug and Cosmetic Act so as to postpone from June 25, 1939, to Jan. 1, 1940, the effective date of certain of its provisions that have not already gone into effect and of the regulations promulgated thereunder. The provisions of the act to be affected by the pending bill if it should be enacted relate for the most part to labeling requirements for foods, drugs, devices and cosmetics and the use of coal-tar dyes in foods, drugs and cosmetics. The bill also proposes to amend chapter V, section 502 (d) of the act so as to require the labels of drugs containing any narcotic or hypnotic substances to state only the "name and quantity or proportion" rather than the "name, quantity, and percentage" of such substances. H. R. 5657, introduced by Representative Sheppard, California, proposes to provide that any person who served in the military or naval forces of the United States during any war or during any recognized campaign or expedition, and who was not dishonorably separated from such service, shall be granted hos-

pitalization and domiciliary care by the Veterans' Administration, subject to the same restrictions and limitations as are now applicable to World War veterans. H. R. 5689, introduced by Representative Welch, California, proposes, among other things, to provide for the registry of surgeons as staff officers on vessels of the United States. H. R. 5736, introduced by Representative Voorhis, California, proposes to amend the Social Security Act so as to authorize an appropriation of \$250,000,000 for the fiscal year ending June 30, 1940, and thereafter each year such sum as may be necessary to enable the states to grant assistance to needy persons who are not eligible for assistance under old-age, dependent children and aid to the blind provisions of the Social Security Act.

DISTRICT OF COLUMBIA

Bills Introduced.—S. 2013, introduced by Senator Capper, Kansas, proposes to amend the Code of the District of Columbia to provide for the organization and regulation of cooperative associations. The bill provides, in part: "In the case of an association formed hereunder which arranges the rendering to its members, of licensed professional services on a nonprofit basis, said association shall not be subject to the insurance laws, shall not be construed as being in violation of any rule against corporate practice of professions, or in violation of statutes regulating licensure of professions." S. 2066, introduced by Senator Reynolds, North Carolina, proposes to provide for the use of scientific tests to determine the degree of intoxication of operators of motor vehicles in the District of Columbia whose vehicle causes personal injury or substantial damage to any other vehicle or property. H. R. 5673, introduced by Representative Bates, Kentucky, proposes to provide that the physicians assigned to Gallinger Municipal Hospital in the District of Columbia and known as chief resident physicians shall be designated and known as chief medical officers.

STATE MEDICAL LEGISLATION

Delaware

Bills Introduced.—Senate Substitute for S. 177, to amend the workmen's compensation act, proposes to increase to \$300 from \$150 the maximum liability of an employer for surgical, medical and hospital services which he must furnish an injured workman. Senate Substitute for S. 253 proposes to grant to physicians, nurses and hospitals treating persons injured through the negligence of others liens on all rights of action, claims, judgments, compromises or settlements accruing to the injured persons by reason of their injuries.

Florida

Bills Introduced.—S. 35 proposes to require all applicants for licenses to practice the healing art, as a condition precedent to their examination or licensure by their respective professional boards, to pass examinations in anatomy, physiology, chemistry, pathology and bacteriology, to be given by a board of examiners in the basic sciences, each of whose members must be learned in the basic sciences named and be a member of the faculty of a university or college in the state having a four year college course. S. 65 was reported favorably to the senate April 11, proposing to enact a new optometry practice act and to establish a state board of optometry to examine and license persons desiring to practice optometry. The bill proposes to define optometry as "the diagnosis of the human eye and its appendages, and the employment of any objective or subjective means or methods for the purpose of determining the refractive powers of the human eyes, or any visual, muscular, neurological or anatomic anomalies of the human eyes and their appendages, and the prescribing and employment of lenses, prisms, frames, mountings, orthoptic exercises, light frequencies and any other means for the correction, remedy or relief of any insufficiencies or abnormal conditions of the human eyes and their appendages." If the bill were enacted in its present form it might be unlawful for a licensed physician to perform any of the acts embraced in the above definition of optometry unless he were also licensed by the optometry board. S. 73 and H. 247 propose to prohibit the retail sale or distribution, except on the written prescription of a licensed physician, of amytal, luminal, veronal, barbital, acid diethylbarbituric or any trade marked or copyrighted prepa-

ration or compound registered in the United States Patent Office containing more than 4 grains to the avoirdupois or fluid ounce of these substances. H. 13 proposes to appropriate \$10,000 annually to the State Board of Health for the purchase and distribution of insulin to residents suffering from diabetes or kindred diseases and who are financially unable to purchase the drug. H. 197 proposes to levy an annual state license tax of \$10 on every person engaged in the practice of any profession. The bill further proposes to levy in addition a county license tax of \$5. The bill also proposes to authorize incorporated cities and towns to impose such further license taxes as they deem proper provided the license tax so imposed does not exceed \$5. H. 204 was favorably reported to the house April 12, proposing to authorize every licensed physician to compound and fill prescriptions written by him in his practice from a drug store or apothecary shop owned and operated by the physician.

Illinois

Bills Introduced.—H. 506 proposes that no person licensed under the medical practice act shall be permitted or compelled to testify without the consent of his patient, in any civil action, concerning any information acquired in attending the patient, which was necessary to enable him to prescribe or act for the patient. H. 612, to amend the medical practice act, proposes to limit licensure in the healing art to citizens of the United States. H. 616 proposes to authorize the issuance of a divorce if either spouse is incurably insane and has been so continuously for five years immediately preceding the filing of the complaint for divorce.

Maine

Bill Enacted.—H. 1433 was approved by the governor March 30, authorizing the formation of nonprofit hospital service corporations to enter into contracts with subscribers for the rendering of hospital service to them through hospitals contracting to do so with the corporations in question.

Bill Introduced.—H. 2230 proposes to require a physician attending a pregnant woman to take or cause to be taken a sample of her blood and to submit that sample for a standard serologic test for syphilis to a laboratory of the state department of health and welfare or to a laboratory approved by the department.

Michigan

Bills Introduced.—S. 269 proposes to enact a separate naturopathic practice act and to establish a board of examiners in naturopathy to examine and license persons to practice naturopathy. The bill provides that "for the purpose of this act naturopathy is defined to include mechanotherapy, of every articulation of the human body but not to adjust any articular subluxation of the spinal column, corrective and orthopedic gymnastics, psychotherapy, hydrotherapy and mineral baths, electrotherapy, thermotherapy, phototherapy, chromotherapy, vibrotherapy, thalmotherapy, dietetics which shall consist of and include the use of foods and such biochemical tissue-building products and cell-salts, organic and inorganic, as are found in the normal body, and the use of vegetable oils and dehydrated and pulverized fruits, flowers, seeds, barks, roots, herbs and vegetables, un compounded and in their natural state." The bill also proposes to make it unlawful for a licentiate to use any title other than the title "doctor of naturopathy." S. 317 proposes to regulate the manufacturing, producing, sale and distribution of drugs, cosmetics and medical supplies and to enact a new pharmacy practice act. S. 318, to amend the narcotic drug act, proposes, among other things, to permit a physician to cause narcotic drugs to be administered by a nurse or intern under his direction. The present law provides that he may cause such drugs to be administered by a nurse or intern under his direction and supervision. S. 319 proposes to regulate the manufacture, sale and advertising of foods, drugs, cosmetics and devices. H. 386 proposes to authorize the organization of corporations to operate voluntary nonprofit osteopathic care plans "whereby osteopathic care is provided at the expense of such corporation to such persons or groups of persons as shall become subscribers to such plan, under contracts which will entitle each such subscriber to definite health and surgical care and supplies, by licensed and registered doctors of the osteopathic school of medicine in their office, in

hospitals, and in the home." As noted, this bill proposes to permit osteopaths to render "surgical care." It is extremely doubtful whether the licenses granted osteopaths by virtue of the present osteopathic practice act permits such licentiates to practice surgery.

Minnesota

Bills Introduced.—S. 1262 proposes to prohibit the retail sale or distribution of devices, appliances, drugs or medicinal agents used for the prevention of venereal disease except by licensed physicians and persons licensed by the State Board of Pharmacy to do so. S. 1289 and H. 1454 propose a procedure whereby hospitals not operated for profit and registered with the State Department of Health may be reimbursed for care and treatment rendered indigents injured in motor vehicle accidents. H. 1367 and S. 1248 propose to authorize the organization of corporations to operate not for profit hospital service plans whereby hospital service may be provided by a hospital or hospitals, with whom such corporations have contracted, to those persons who become subscribers to such plans under contracts which entitle each subscriber to stated hospital care.

Missouri

Bills Introduced.—S. 348, to supplement the osteopathic practice act, proposes that in the administration of any public health project within the state, whether conducted with state funds or with funds furnished by the United States government to be expended by any Missouri agency, "all doctors of medicine and doctors of osteopathy must be accorded equal rights and privileges." H. 692 proposes as a condition precedent to the issuance of a license to marry that both parties to the proposed marriage present the certificate of a licensed physician that he or she is free from venereal disease in a communicable stage.

Nebraska

Bill Introduced.—Bill 507 proposes to authorize the organization of corporations not for profit to operate nonprofit hospital service plans whereby hospital service may be provided by such corporations or by hospitals with whom they have contracted to persons who become subscribers under contracts with the corporations. Hospital service to be provided by such a corporation is to consist of hospital care, including board and room, general nursing care, use of operating room, and routine laboratory services.

New Jersey

Bills Introduced.—S. 318 proposes that the law making it a misdemeanor to inflict unnecessary cruelty on a living animal shall not be construed to prohibit or interfere with properly conducted scientific experiments performed under the authority of the State Department of Health. The present law apparently limits the institutions or societies which the department may authorize to conduct such experiments by stating that the department may authorize such experiments to be conducted by agricultural stations and schools maintained by the state or federal government or by medical societies, universities, colleges and philanthropic institutions incorporated or authorized to do business in the state and having among their corporate purposes investigation into the causes, nature, prevention and cure of diseases. A. 296 proposes extensive amendments to the existing medical practice act. Among other things, the bill proposes to authorize the issuance of licenses to naturopaths and to provide that two members of the board of medical examiners must be naturopaths. The bill also proposes that persons licensed to practice osteopathy prior to May 23, 1935, may continue to practice osteopathy "as herein defined," defining the practice of osteopathy to "include the diagnosing, treating, operating or prescribing for any human disease, pain, injury, deformity, mental or physical condition; *provided, however,* that a license to practice osteopathy shall not permit the holder thereof to prescribe, administer or dispense drugs for internal use in the treatment of any human ailment, disease, pain, injury, deformity, mental or physical condition or to perform such surgical operations as require cutting." The bill also proposes to redefine the practice of chiropractic to "include the diagnosing, treating, dietary and hygienic control, and the detecting and adjusting, by hand of vertebral subluxations for the relief of pain and disease; *provided, however,* that a license to practice chiropractic shall not entitle the holder to perform surgery or administer drugs." The bill proposes also to require applicants

for a license to practice any form of the healing art to present evidence, among other things, of having completed an internship acceptable to the board for at least one year in a hospital approved by the board or in lieu thereof to have completed one year of postgraduate work acceptable to the board except that naturopaths and chiropractors may serve internships in professional schools or clinics approved by members of the board of examiners who are osteopaths, chiropractors and naturopaths. A. 459 proposes to enact a separate chiropractic practice act and to establish a board of chiropractic examiners to examine and license persons to practice chiropractic. The bill proposes to define "chiropractic" as "The science of diagnosing, locating and correcting interference with nerve transmission and expression. The license to practice chiropractic shall include diagnosing, treating and prescribing for any human disease, pain, injury, deformity, mental or physical condition; *provided, however,* that a license to practice chiropractic shall not permit the holder thereof to prescribe, administer, or dispense drugs in the treatment of any human ailment, disease, pain, injury, deformity, mental or physical condition or to perform such surgical operations as require cutting."

New York

Bills Introduced.—A. 2251 and S. 1786 propose to require the state to reimburse a county 75 per cent of the total expended by it in extending "physical repair" to physically handicapped adult unemployed persons. The bills define "physical repair" as "the substantial correction or cure, by surgical or medical treatment and care, or by hospitalization, or by use of approved apparatus or device, of physical defects or physical disabilities of physically handicapped adult unemployed persons in such manner and to such extent as reasonably may be expected to fit them for remunerative occupation or employment." The bills then impose on the counties or other political subdivisions the duty of supplying such "physical repair" to the individuals noted. A. 2252 and A. 2241 propose a system of compulsory and voluntary health insurance, whose benefits are to consist of all forms of medical, dental and hospital services. All employees, excepting only persons employed at other than manual labor and receiving wages in excess of \$2,500 a year, are to be subject to the compulsory insurance of the bill. All other persons are eligible to accept the voluntary insurance offered by them. S. 1776 and A. 2243 propose to create a temporary commission to survey the existence and prevalence of hay fever in the state, to devise ways and means for its prevention and elimination and to recommend methods for the treatment, relief and cure of persons suffering from hay fever. The bill proposes to appropriate \$10,000 to defray the expense of the commission. A. 2242 proposes to prohibit the employment as a domestic servant of any person who does not possess a physician's certificate, executed after a physical examination and a standard serologic test for syphilis, that the person named is not infected with syphilis, or, if infected, is not in a stage of that disease whereby it may become communicable. In effect, the bill proposes to require such servants to submit to the examination stated annually. S. 1719 proposes to recodify the insurance laws of the state. It includes an article IX-C, which will permit the organization of nonprofit corporations either (1) to furnish medical expense indemnity or (2) to operate hospital service plans to persons who become subscribers under contracts with such corporations. Medical expense indemnity is to consist of reimbursement for medical care provided through duly licensed physicians, for nursing service and for furnishing necessary appliances, medicines and supplies. Each such plan must be open to the participation of duly licensed physicians without discrimination against schools of medical practice. S. 1627 and A. 2082 propose to extend to March 15, 1940, the life of the committee authorized by chapter 682, Laws, 1938, to investigate the health requirements of the people and to recommend such health insurance proposals or proposals with respect to state medicine as it deems advisable. A. 2107 proposes, in effect, to permit each recipient of relief to select the physician or dentist he desires to treat him at state expense.

Oklahoma

Bills Introduced.—H. 519, to amend the medical practice act, proposes (1) to require representation on the board of medical examiners for regular, eclectic and homeopathic physicians,

omitting the provision in the present law which requires one member of the board to be a physio-medical physician; (2) to provide that "the employment of what is commonly known as 'cappers' or 'steerers' in procuring practice" shall be cause for the revocation or suspension of a license "Provided that the term 'Cappers' or 'Steerers' shall not be construed to apply to: Bona fide Agents of Hospitals and Clinics legally organized. Provided further that such hospitals or clinics shall not be permitted to enter into contracts for hospital or medical services to be performed within thirty days of the date of said contract and provided further that said organization of clinics or hospitals shall be organized on a mutual or cooperative non-profit plan in connection with some recognized farm or labor union or church or charitable organization"; (3) to make it a ground for revocation or suspension of a license for a licensee to have professional connection with or to lend his name to any person engaged unlawfully in the practice of medicine and surgery or for a licensee to engage in practice under any name other than the one specified in his license; (4) to provide that a licensee whose license has been revoked or suspended by the board of examiners may appeal to the district court of the county of his residence, which is to try the case *de novo*, the present law providing for an appeal directly to the Supreme Court from the decision of the board, and (5) to provide that no decision of the board revoking or suspending a license shall become final "pending final decision of the Supreme Court of this State." H. 624 proposes to repeal the present chiropractic practice act and apparently the basic science act so far as it relates to chiropractors. The bill proposes that the governor of the state, the secretary of state and the chairman of the corporation commission shall constitute a board of commissioners to determine the reputability of chiropractic educational institutions. A person desiring to practice chiropractic must apply to this board for a certificate of reputability of the chiropractic institution from which he graduated. On the issue of such a certificate, a person designated as a trustee to enforce the act is required to issue without examination or any other showing of qualifications a license to practice chiropractic. Apparently an applicant to obtain such a license need not pass a basic science examination. The bill proposes to define chiropractic as "the science and art of Chiropractic as taught in reputable Chiropractic Educational Institutions; provided that the art of Chiropractic consists in the palpation and adjusting of disrelationship in or of the vertebral column, and incidentally that of any part of the human body that in any manner affects the attitude or relationship of the vertebral column, by the hands of the Chiropractor only, to relieve or remove interference with the receipt, transmission, or application of nerve force."

Pennsylvania

Bills Introduced.—H. 671 proposes a system of compulsory and voluntary health insurance, the benefits of which are to consist, among other things, of all forms of medical, dental and hospital services. All employees except farm laborers and domestic servants of an employer having less than three domestic servants are to be subject to the compulsory features of the bill. All other persons may elect to come under the voluntary provisions of the bill. H. 685 and H. 686 propose to authorize the organization of corporations to operate nonprofit medical service plans whereby medical services may be provided to subscribers of low income "for prepayment, periodical or lump sum payments." H. 709 proposes to prohibit the manufacture, distribution or advertising of misbranded or adulterated foods, drugs, cosmetics and devices. H. 716 proposes to authorize any licensed optometrist to issue the certificate of ocular and visual efficiency which may be required by any law of the commonwealth or by any ordinance or resolution of any political subdivision of the commonwealth. H. 727 proposes (1) to prohibit the operation of a pharmacy or hospital unless registered with the State Board of Pharmacy and (2) to prohibit any person or broker, except a person owning or operating or employed in a pharmacy, hospital, place of manufacture or wholesale vendor's place of business from vending any drugs, cosmetics or medical supplies unless licensed by the State Board of Pharmacy. H. 728 proposes to place the sale

and distribution of cosmetics, as defined, within the prohibitions of the pharmacy practice act. H. 756 proposes to require the Department of Welfare to supply hearing aids or devices to persons who are deaf or hard of hearing and who are financially unable to purchase them. H. 934 proposes to authorize the formation of corporations "for the purpose of establishing, maintaining and operating a non-profit healing art service plan whereby healing arts services may be provided through any person registered with such corporation to subscribers thereto and their dependents." Healing art services, according to the bill, means the general and usual services rendered and care administered by doctors of medicine, doctors of osteopathy, dentists, registered nurses and registered pharmacists. The bill proposes that each branch of the healing arts noted which desires to participate in such a corporation shall have at least one incorporator and that no branch of the healing arts shall have a majority of incorporators. S. 318 proposes to authorize the sexual sterilization of inmates of state institutions who are criminally insane or who have been convicted a second time of a sex crime. H. 786 proposes to enact a separate chiropractic practice act and to establish an independent chiropractic board of examination and licensure to examine and license persons applying for licenses to practice chiropractic. The bill defines chiropractic as "the examination of the human spine by observation palpation or X-ray and the adjustment of any or all misalignments of vertebrae or adjacent bones or tissues through the use of the hands." H. 818 proposes to appropriate \$10,000 to the Department of Health for the care and maintenance of carriers of typhoid fever bacilli.

Rhode Island

Bill Passed.—H. 782 passed the house March 29, proposing to grant to hospitals treating persons injured by reason of an accident not covered by the workmen's compensation act, liens on all claims, rights of action, judgments or compromises accruing to the injured persons because of their injuries.

Bill Introduced.—S. 181 proposes to require all applicants for licenses to practice any form of the healing art as a condition precedent to examination and licensure by their respective "professional" boards, to pass examinations in anatomy, physiology, pathology, symptomatology, chemistry, bacteriology and public health, to be given by the board of examiners in the basic sciences. The members of this board are to be selected because of their knowledge of the basic sciences mentioned and each member is to be a member of the faculty either of Brown University, of Rhode Island State College or of Providence College. No member of the board may be actually engaged in the practice of the healing art.

Texas

Bill Introduced.—H. 897 proposes to prohibit the sale of any truss or other mechanical device commonly used for the relief of rupture or hernia, except on the written prescription of a licensed physician. The bill also proposes to make it unlawful for any person other than a licensed physician to offer to fit any such truss or mechanical device.

Vermont

Bill Enacted.—H. 68 was approved by the governor April 10, authorizing the organization of corporations to operate nonprofit hospital service plans whereby hospital care may be provided by hospitals with whom such corporations have contracted for such care to such of the public as become subscribers to plans under contracts which entitle each subscriber to stated hospital care.

Wisconsin

Bills Introduced.—A. 543, to amend the medical practice act, proposes that no hospital supported in whole or in part by public funds or exempt from public taxation shall discriminate against any physician whose license to practice has been revoked and subsequently restored, nor deny him admission to practice in such hospital. A. 574 proposes to require the expenditure annually of \$25,000 for the study of and research into the causes, prevention and cure of cancer. A. 599 proposes to require licensed physicians who are nonresidents to file their licenses or certificates with the county clerk in each county in which they practice.

WOMAN'S AUXILIARY

Georgia

At a meeting of the auxiliary to the Clark County Medical Society, Dr. W. D. Gholston, Danielsville, spoke on socialized medicine. Miss Susan Myrick, columnist and feature writer of the *Macon Telegraph*, spoke on "Problems of the Adolescent" at a recent meeting of the auxiliary to the Bibb County Medical Society.

The auxiliary to the Fulton County Medical Society met recently at the Academy of Medicine in Atlanta. Mrs. Warren A. Coleman, president of the auxiliary to the Medical Association of Georgia, and Dean Raimundo de Ories of St. Philip's Cathedral gave addresses. The auxiliary sponsored a health program January 11, attended by presidents and health chairmen of the Parent Teacher Association. A film, "Three Counties Against Syphilis," depicted the work of the mobile unit last summer. The auxiliary has raised funds for the treatment of patients with infantile paralysis.

The auxiliary to the Richmond County Medical Society met at the home of Mrs. Ralph Chaney, Augusta, in November. Miss Fannie B. Shaw, director of health education of the state department of public health, was the speaker.

Idaho

The auxiliary to the Boise Medical Society met at the home of Mrs. O. F. Swindell January 10. Mrs. Edith Davis spoke on problems arising in the home and school in the care of twins and triplets. The south side auxiliary met January 13 at Twin Falls. Mrs. A. A. Boston reviewed an article on the American Medical Association which was recently published in *Fortune* magazine.

The auxiliary to the North Idaho Medical Association met in Lewiston January 18. The auxiliary is preparing a history of the medical men who were pioneers of the region and a collection of old instruments and other equipment used by them.

The auxiliary to the Kootenai County Medical Association met at the home of Mrs. Alexander Barclay Jr. in Coeur d'Alene January 3. Mrs. R. T. Henson, president, asked members to cooperate with other auxiliaries in compiling data on the early physicians of Idaho. Garments for infants were made and will be distributed through the county health unit.

Illinois

An auxiliary to the DeWitt County Medical Society was recently organized with the assistance of Mrs. Charles C. Winning, chairman of organization of the auxiliary to the Illinois State Medical Society.

Dr. Harry Otten, Springfield, spoke on socialized medicine at a meeting of the auxiliary to the McLean County Medical Society January 10.

At a meeting of the auxiliary to the Sangamon County Medical Society in Springfield January 9 Mrs. S. R. Magill reviewed "The Stormy Petrel of Surgery," and February 13 Dr. G. Henry Mundt of Chicago spoke on socialized medicine.

Iowa

The sixth Annual Health Essay Contest, sponsored by the Iowa State Medical Society on "Good Health and How to Maintain It," closed March 15. Any high school student in Iowa was eligible to participate. The judges included a member of the state department of public instruction, of the state department of health and of the Iowa State Medical Society and two members of the auxiliary.

Kentucky

The auxiliary to the Hardin County Medical Society in Elizabethtown was addressed by Mrs. Walter Scott, who spoke on the antepartum and maternity work which the TVA is doing in conjunction with the public health service.

Mrs. Arthur T. McCormack entertained the auxiliary to the Jefferson County Medical Society at Louisville on the occasion of the birthday of the Woman's Auxiliary Section of the *Kentucky Medical Journal*.

The Auxiliary has established a benevolent fund for widows and orphans of former members of the Jefferson County Medical Society. At a party to raise money for this fund in November \$119 was realized. On November 30, the auxiliary, cooperating with the Social Hygiene Association, sponsored a motion picture "Under Five Flags," raising \$25 for the benefit of the sewing unit of the auxiliary. The Hospital Committee raised funds for the Children's Free Hospital at Christmas time, and also distributed gifts to patients in the City Hospital.

Minnesota

The auxiliary to the Olmsted-Houston-Fillmore-Dodge County Medical Society met at the Mayo Foundation House, Rochester, January 4. Edward H. Weld Jr. discussed health insurance plans being tried in various localities. Mrs. H. C. Habein, president, gave an illustrated talk on England.

Dr. George A. Earl and Mr. F. M. Brist addressed the board meeting of the auxiliary to the Minnesota State Medical Association in St. Paul February 1.

Nebraska

Mrs. Lucian Stark, former member of the state legislature of Nebraska, discussed lobbying and legislative procedure at a meeting of the board of directors of the auxiliary to the Nebraska State Medical Association in Lincoln, January 16.

Oklahoma

The auxiliary to the Pittsburg County Medical Society met in December and prepared Christmas baskets, also contributing cod liver oil to families in need of this remedy. January 13 a meeting was held in McAlester. Mrs. Walter Dell reviewed the "Life of Baron Lerry, French Military Surgeon."

The auxiliary to the Garfield County Medical Society is helping underprivileged children in Enid.

Dr. Ned R. Smith gave an address on socialized medicine in foreign countries at a meeting of the auxiliary to the Tulsa County Medical Society January 3.

The auxiliary to the Oklahoma City Medical Society, January 25, resumed their regular monthly sewing and scrap-book making for the Crippled Children's Hospital, with sixty-seven members present. A report on Medical Legislation was given by Mrs. George Garrison, president of the auxiliary to the Oklahoma State Medical Association.

Oregon

An auxiliary to the Josephine County Medical Society was organized at Grants Pass in October. An address was given by Dr. S. B. Osgood, secretary of the county society. The members will have as a definite project the distribution of *Hygia*.

The auxiliary to the Coos-Curry Counties Medical Society was held at Bandon in November. Many of the members drove long distances to attend the meeting. A program was held on "Socialized Medicine and How the Auxiliary Can Combat It."

Dr. Charles E. Sears spoke on "What the Medical Society Can Do to Provide Better Medical Aid to the People," and Dr. R. L. Benson on "The National Health Conference" before the auxiliary to the Multnomah Medical Society.

The Oregon auxiliary will stress the study of socialized medicine in all its auxiliaries this year.

Pennsylvania

The auxiliary to the Allegheny County Medical Society met in Pittsburgh November 22. Plans were made for forming study groups for the discussion of socialized medicine. Dr. George R. Harris, secretary of the medical society, and Mr. Homer Saint Gaudens, director of the Department of Fine Arts of Carnegie Institute, were speakers.

The auxiliary to the Berks County Medical Society in Reading January 21 held a health conference. Mrs. Augustus S. Kech discussed socialized medicine and Dr. Harry B. Corrigan spoke on "Communicable Diseases and Their Prevention."

Mrs. Walter F. Donaldson, president of the auxiliary to the Medical Society of the State of Pennsylvania, was speaker at a recent meeting of the auxiliary to the Lehigh Medical Society.

The auxiliary entertained with a card party November 30 for the benefit of the Medical Benevolence Fund.

The auxiliary to the Chester County Medical Society met at Glen Mills School November 15. The program was arranged by Major H. R. Hickman, superintendent.

At a meeting of the auxiliary to the Northampton County Medical Society November 9 Mrs. Donaldson spoke briefly on the enlarged public relations program that the state medical society had planned for the auxiliaries, suggesting that the county auxiliary hold a health institute each year.

South Carolina

Dr. W. A. Hart discussed the new Maternal Health Center in Richland County before the auxiliary to the Columbia Medical Society in November.

Dr. John F. Rainey spoke on heart disease in December before the auxiliary to the Greenville Medical Society. Among the guests were Mrs. Charles P. Corn, president-elect of the aux-

iliary to the Southern Medical Association, and Mrs. C. C. Ariail, president of the auxiliary to the South Carolina Medical Association.

Mrs. C. C. Ariail addressed the auxiliary to the Spartanburg County Medical Society at a recent meeting on "The Doctor's Wife and the Educational Project to Be Sponsored by Each Auxiliary."

Wisconsin

The auxiliary to the Dane County Medical Society, Madison, January 11, voted to donate \$10 to the Chinese Aid Council for nursing and medical supplies.

The auxiliary to the Medical Society of Milwaukee County gave a tea and musicale in honor of the new officers January 13. More than 100 members were present. Dr. Eben J. Carey, dean of Marquette University School of Medicine, discussed the national health program at a meeting of the auxiliary February 10.

MEDICAL ECONOMIC ABSTRACTS

CASH INSURANCE IN FRANCE

According to a report of the French delegate to the recent meeting of the International Medical Association, the existence of a partial cash indemnity provision in the French system has enabled it to pass through a recent crisis without resorting to that deterioration of quality of medical service and consequent deception of the patient that invariably characterize such crises in systems based on service benefits.

According to the report, which appears in the *Revue internationale de médecine professionnelle et sociale* (11:133 [Nov.] 1938), the fall in the value of the franc led to an increase in the income limits for the insured and compelled the physicians to raise their fees as measured in the falling franc. The French system of sickness insurance provides that the insured shall pay approximately 20 per cent of a legal reimbursement fee schedule. The physician may charge whatever fee he wishes, which is paid by the insured, who then looks to the insurance organization for reimbursement of 80 per cent of a fixed schedule.

In 1937 and 1938 the cost of living increased so rapidly in Paris that the physicians were compelled to increase their charges. Since the reimbursement schedule remained fixed, the burden on the insured became much heavier until they were required in many cases to pay 50 per cent of the cost. To meet this situation, which in other countries has been met by a forced reduction of the quality of the service, the insurance administration, which had already raised the salaries of its own administrators, was compelled by the Ministry to raise the schedule of reimbursement. In spite of this increase, the insured is still compelled to pay about one third of the costs.

The French representative explains that the French system at least permits some fairly rapid adjustments to monetary or economic changes without the long and usually hopeless conflicts between physicians and insurance societies which arise out of attempts to adjust the payment for medical service.

UNEMPLOYMENT AND HEALTH INSURANCE IN GREAT BRITAIN

While the benefits provided by unemployment insurance in Great Britain have been frequently changed to meet conditions, health insurance provisions remain inflexible. This puzzles the Bureau of Research and Statistics of the Social Security Board, which has just published a report on "Unemployment and Health Insurance in Great Britain, 1911-1937," in which this conclusion concerning alterations in the respective systems is repeated several times. A royal commission was similarly puzzled in 1926 and could only say that this condition "seems to us difficult to defend."

The Bureau of Research and Statistics and the royal commission compared only cash payments for unemployment in the two systems and both overlooked the existence of the same failure to alter terms in accordance with new conditions in the provision for medical treatment. This inflexibility in

medical service works a far greater injustice and probably offers the real explanation of the failure of cash payments during illness to keep step with similar payments under unemployment insurance. All existing compulsory sickness insurance systems balance their books by failure of patients to evaluate the quality of medical service given; this makes it unnecessary to raise cash premiums as scientific progress increases the cost of providing benefits.

Flexibility in unemployment insurance is due primarily to the fact that premiums and benefits are both paid in cash, the value of which can be judged by the insured. The inflexibility in sickness insurance is maintained by reason of the fact that when cash premiums are changed into service benefits before they reach the insured the latter are unable to judge what they receive and do not realize that the books are balanced at the expense of their health.

BEWARE OF COLLECTION AGENCIES

The officers of a large midwestern collection agency which used an "account purchasing" contract were sentenced to serve three years for use of the mails to defraud. After some court delays these officers are now in custody and on the way to the penitentiary.

For years physicians have been warned by THE JOURNAL to beware of collection agencies, especially those using contracts. An account purchasing contract gives the appearance of being a finance plan by promising to pay the physician from 50 to 80 per cent of the face value of current accounts listed for collection. Actually the agency using such a contract is not obligated to liquidate any accounts but offers the account purchasing device as an inducement to obtain a list of delinquent accounts from the physician.

Once the physician has signed this type of contract, he finds that it contains all the provisions of the old collection contract, permitting the agency to have ownership of the accounts, power of attorney to settle the accounts in any manner which the company chooses, full commissions on accounts when the dissatisfied physician seeks to have them withdrawn, and perhaps a *doctet* fee entitling the agency to 50 cents on each account listed. A special feature of the account purchasing contract permits the agency to retain 25 or 30 per cent of the aggregate amount of the accounts listed for collection. If \$500 worth of accounts has been listed, the agency is entitled, under the 30 per cent contract, to \$150 before the physician has to be paid anything.

With the precedent set by the aforementioned case, collection agencies which pretend to be finance companies and withhold an accounting of money collected from delinquent debtors are now recognized by postal authorities as "schemes to defraud" Agents or officers of the agency in question have organized at least five other collection agencies which use similar contracts. There are also many other independently organized agencies that use such "account purchasing" contracts. The post office inspectors are waiting for complaints.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH)

ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 1643

CALIFORNIA

University News.—A short course for practicing physicians on 'Endocrinology and Related Metabolic Diseases' was given at the University of California Medical School, San Francisco, April 5-8. The medical school observed 'alumni day' March 22 as a part of the celebration commemorating the seventy-first charter anniversary of the University of California.

Epidemic Diarrhea of the Newborn.—Two outbreaks of epidemic diarrhea in the newborn were investigated during February, one in the southern part of the state and the other in northern California, according to the bulletin of the state board of health. Both outbreaks occurred in nurseries connected with institutions. Clinically, they were identical. Within from five to seven days after birth the infants became ill with diarrhea, dehydration, loss of weight and toxemia. Eleven cases occurred in one nursery and twenty-seven in the other. The exact cause of these outbreaks is unknown and all bacteriologic work undertaken up to March 18 had proved negative. Certain control measures have proved effective in preventing the spread of the epidemic.

COLORADO

Annual Spring Clinics.—The sixth annual spring clinics of the Pueblo County Medical Society will be presented April 28-29 at the Congress Hotel, Pueblo. The speakers will be:

- Dr. John B. Farley, Pueblo Corpus Luteum and Its Role in Vomiting of Pregnancy
- Dr. Scott A. Gale, Pueblo The Kidney in Pregnancy
- Dr. William-T. H. Baker, Pueblo Congenital Uterine Malformations
- Dr. Clinton K. Smith, Kansas City Mo. Urinary Infections
- Dr. John D. Geissinger, Pueblo Vomiting in Infancy
- Dr. Charles W. Streamer, Pueblo A Resume of Some of the Newer Things in Medicine
- Dr. Lester L. Ward, Pueblo, Lesions of the Lung Excluding Pneumonia and Tuberculosis
- Dr. Osgood S. Philpott, Denver, Current Ideas Regarding Etiology, Diagnosis and Treatment of Herpes Zoster
- Dr. Francis W. Cutts, Pueblo, Fatalistic Attitudes in Modern Medicine
- Dr. Samuel B. Potter, Pueblo, Relaxations of the Pelvic Floor Causes
- Dr. J. Sims Norman, Pueblo, Early Orthopedic Treatment of Infantile Paralysis
- Dr. William Andrew Bunten, Cheyenne, Craniocerebral Injuries
- Dr. Kenneth M. Kelley Jr., Pueblo Toxic Reactions Following the Use of Sedatives
- Dr. Royal H. Finney, Pueblo, Amebiasis
- Dr. Frank H. Zimmerman, Pueblo Dementia Praecox
- Dr. Tate Miller, Dallas, Texas, Colitis

In the evening there will be a stag banquet at the Colorado State Hospital.

CONNECTICUT

The State of Health.—The general death rate in Connecticut was 97 per thousand population, the lowest on record, according to provisional figures. The births totaled 23,397 for the year, accounting for a rate of 131 per thousand population, the highest since 1933, when it was 132. The infant mortality rate was 363 per thousand living births. The maternal mortality rate was 29 per thousand living births from a total of sixty-seven maternal deaths.

DELAWARE

Society News.—A symposium on heart disease was presented before the New Castle County Medical Society, Wilmington, March 17 by members of the staff of the Woman's Medical College of Pennsylvania. Drs. Henry D. Jump, Robert G. Torrey, Jacob H. Vastine and William G. Leaman Jr. Dr. Joseph Stokes Jr., Philadelphia, discussed "Advances in the Study of Acute Infectious Diseases" before the society February 21. Dr. M. Edward Marten, Brooklyn, lectured at the Delaware Academy of Medicine March 28 on "Advantages of the State Medical Examiner in Contrast to the Present Coroner's Office."

DISTRICT OF COLUMBIA

Lectures by Professor Carlson.—Dr. Anton J. Carlson, professor of physiology, Department of Medicine, Division of Biological Sciences, University of Chicago, will address the Academy of Medicine, Washington, April 24 on "Science and the Common Life." He will address the Smith-Reed-Russell Society of George Washington University School of Medicine April 25 on "Notes on Medical Education and Medical and Public Health Services in Russia and China."

Portrait of Dr. William A. White.—A portrait of the late Dr. William A. White, former superintendent of St. Elizabeths Hospital, Washington, was presented to the hospital by the Rev. U. G. B. Pierce, president of the board of visitors, on behalf of Dr. White's friends and associates. It was accepted on behalf of the Department of the Interior by Secretary Harold L. Ickes, who paid tribute to Dr. White's contribution to the hospital and to American psychiatry and who emphasized the fact that the hospital "always had been administered by outstanding men who had been free from political interference." Dr. Winfred Overholser, superintendent, announced that Mrs. White had given to the hospital Dr. White's library relating to psychiatry and the broad field of medical sciences, it was formally accepted by Secretary Ickes.

IDAHO

New Director of Public Health.—Dr. Howard L. McMartin, Boise, formerly director of the division of maternal and child health and crippled children, state department of public welfare, has been appointed director of the division of public health of the department.

ILLINOIS

Tuberculosis Meeting.—The annual meeting of the Illinois Tuberculosis Association will be held at the Pere Marquette Hotel, Peoria, April 24-25. Among other speakers will be Dr. Edward Kent Ellis, Murphysboro, "The Family Physician and the Tuberculosis Problem in Southern Illinois", William T. Holladay, Amboy, "The Family Physician Views the Tuberculosis Problem", Loren L. Collins, La Salle, "The Sanatorium Aids the Family Physician", and Frederick M. F. Meirner, Peoria, "The Peoria Sanatorium District."

State Medical Meeting in Rockford.—The ninety-ninth annual meeting of the Illinois State Medical Society will be held at Rockford May 2-4 with headquarters at the Faust Hotel, under the presidency of Dr. Samuel E. Munson, Springfield. Dr. Leroy E. Parkins, Boston, will deliver the oration in medicine Tuesday afternoon on "Integration of Personality Factors in Health and Disease" and Dr. Hiram Winnett Orr, Lincoln, the oration in surgery Wednesday morning on "The Prevention and Cure of Local and General Infection in Compound Fractures and Other Open Wounds." Among the physicians on the program are:

- Dr. Isidor Harrison Tumpeer, Chicago The Upper Respiratory Revenge of the Allergic Child
- Dr. Mitchell A. Spellberg, Chicago, Role of Cervinamic Acid in Various Clinical Conditions
- Dr. Karl A. Meyer, Chicago, Management of Local and Spreading Peritonitis Associated with Appendicitis
- Dr. Warren H. Cole, Chicago Surgery of the Common Bile Duct
- Dr. Winston H. Tucker, Evanston, Rocky Mountain Spotted Fever in Illinois
- Dr. Howard A. Lindberg, Chicago The Pneumonia Control Program in Illinois
- Dr. Pierre A. Steele, Decatur Tuberculosis
- Dr. Lawrence M. Hilt, Grand Rapids Mich. Some Pitfalls in Roentgenologic Diagnosis

The program includes symposiums on pneumonia and fractures, one session on endocrinology and Tuesday afternoon the following instruction courses:

- Dr. Jacob J. Potter, Rockford Anatomy and Pathology of the Middle Ear Tract
- Dr. Thomas C. Galloway and Eustace I. Benjamin, Evanston Acute Laryngeal Obstruction Its Causes Pathology and Treatment
- Dr. Thomas D. Allen, Chicago Gonioscopy
- Dr. George P. Gubior, Ottawa Ill. Concomitant Strabismus Some Important Details in Its Diagnosis

The secretaries' conference will be held Tuesday evening with the following speakers:

- Dr. Robert S. Berghoff, Chicago Cooperation of the County Secretaries with the Scientific Committee
- Dr. William W. Bauer, Chicago The Influence of Health Insurance on the Practice of Medicine
- Dr. Herman M. Solovay, Chicago Syphilis Control in Illinois Its Relation to County Societies

Among others, Dr. Elston L. Belknap, Milwaukee, will address the Central States Society of Industrial Medicine and Surgery Tuesday morning on "Practical Tests of Functional Capacity in Silicotics." At a meeting of the Physicians' Asso-

ciation, state department of public welfare Tuesday a feature will be a symposium on mental disorders following head trauma. The president's dinner will be Wednesday evening with Dr. Rock Sleyster, Wauwatosa, Wis., President-Elect, American Medical Association, as the speaker. There will also be a veterans' service committee dinner and various alumni luncheons.

Chicago

Lectures at Billings Hospital.—Dr. August Krogh, director of the Institute of Zoophysiology, University of Copenhagen, Denmark, and winner of the 1920 Nobel Prize in physiology, will lecture at the Billings Hospital, University of Chicago, May 2. His subject will be "The Effects of Posture on Circulation." Dr. Thomas Addis, San Francisco, will lecture at the hospital April 24 on "The Treatment of Nephritis."

Surgical Prize Awarded to Dr. Hedin.—The first annual award of the Chicago Surgical Society will be made at a meeting of the society May 5 to Dr. Raymond F. Hedin of Cook County Hospital and the department of surgery, Rush Medical College. Dr. Hedin's essay, entitled "Polypoid Disease of the Colon: Two Proposed Surgical Procedures, Including the Description of a Colonoscope," will be presented at the same meeting. The \$250 prize is offered to some young man devoting himself to surgery in Chicago, who is not a member of the Chicago Surgical Society, for meritorious work in one or both of the fields of experimental and clinical surgery.

Course on the Rorschach Method.—S. J. Beck, Ph.D., will conduct a course in the application of the Rorschach method at Michael Reese Hospital, Chicago, May 15-20, the week following the annual convention of the American Psychiatric Association. Additional information may be obtained from the librarian of the hospital. Tentative plans are also being made for a similar ten day course to be offered later in the summer. The dates will be arranged to meet the convenience of prospective registrants. Interested persons having preferences as to date are invited to communicate with the librarian of the hospital.

INDIANA

Changes in Health Officers.—Dr. William Harry Hutto has been appointed health officer of Kokomo and secretary of the city board of health, succeeding Dr. William J. Martin. Dr. Claude Dollens, Oolitic, has been appointed health officer of Lawrence County, succeeding the late Dr. John S. Woolery, Bedford. Dr. Thomas J. McKean, Montpelier, has been named health officer of Blackford County to succeed the late Dr. Elmer D. Shaddy.

Society News.—Dr. Jacob Arnold Bargaen, Rochester, Minn., discussed "Medical and Preoperative Management of Intestinal Obstruction" before the Tippecanoe County Medical Society at Lafayette April 11.—The LaPorte County Medical Society was addressed in Michigan City March 16 by Dr. Reed M. Nesbit, Ann Arbor, Mich., on "Treatment of Urinary Tract Infections with Reference to the Newer Drugs."—At a meeting of the Floyd County Medical Society, New Albany, March 10, Dr. John F. Habermel, New Albany, spoke on "Early Signs and Symptoms of Cancer."—Dr. Andrew M. Brenner, Winchester, addressed the Randolph County Medical Society in Winchester March 13 on "Electrocardiography and Its Practical Application."—At a meeting of the Madison County Medical Society, Anderson, recently Dr. Kenneth G. Kohlstaedt, Indianapolis, spoke on "Medical Treatment of Biliary Tract Diseases."—Dr. Raymond W. McNealy, Chicago, addressed the Muncie Academy of Medicine March 14 on "Vitamins in Surgery."

IOWA

Public Health Meeting.—The Iowa Public Health Association will hold its thirteenth annual meeting at the Hotel Savery, Des Moines, April 24. The following speakers will participate, among others:

Dr. Roy R. Jones, U. S. Public Health Service, Medical Aspects of Industrial Hygiene.
L. O. Nolf, Ph.D., Iowa City, Trichina Larvae in Rats: Relation to Trichiniasis (Trichinosis) in Man.
Dr. Florian E. Schmidt, Chicago, Present Status of Antipneumococcal Serum and Sulfapyridine in the Management of the Pneumonias.
Dr. Paul Stephen, Des Moines, Report of a Food-Borne Epidemic of Typhoid Fever.

State Medical Meeting in Des Moines.—The eighty-eighth annual session of the Iowa State Medical Society will be held at the Hotel Fort Des Moines, Des Moines, April

25-27 under the presidency of Dr. Arthur W. Erskine, Cedar Rapids, whose address will be entitled "Principles and Practice." Out-of-state speakers will include:

Dr. Soma Weiss, Boston, Treatment of Circulatory Collapse and Shock.
Dr. Nymphus Frederick Hicken, Omaha, Diagnosis of Breast Tumors with Management of Carcinoma.
Dr. Edwin A. Merritt, Washington, Hyperparathyroidism and Its Recent Treatment.
Dr. Frank H. Lahey, Boston, New Ideas in Thyroid Surgery.
Dr. William H. Holmes, Chicago, Bacillary Dysentery.
Col. Kent Nelson, Omaha, Medical Department of the United States Army in Civilian Conservation Corps Activities.
Dr. William L. Benedict, Rochester, Minn., The Etiology of Chorioretinitis.
Dr. Willis C. Campbell, Memphis, Tenn., Use of Vitallium for Fixation of Fractures.
Dr. Irvin Abell, Louisville, Ky., subject not announced.
Dr. Harold R. Conn, Akron, Ohio, Treatment of Fractures of the Spine.

Tuesday and Wednesday afternoons the program will be devoted to sectional conferences, including a symposium on the determination of alcohol in blood and urine. Thursday afternoon there will be a symposium on fractures. A smoker will be held Tuesday evening and the annual banquet Wednesday evening. The forty-second annual meeting of the State Society of Iowa Medical Women will be held April 25. Branch 19 of the American Medical Women's Association will also meet the twenty-fifth. The tenth annual session of the woman's auxiliary to the state medical society will be held April 25-26.

KENTUCKY

State Bureau of Medical Service Created.—At the request of the council of the Kentucky State Medical Association, a bureau of medical service has been created in the state department of health, with Dr. John B. Floyd, Richmond, as director. The bureau will assist the medical profession of the state in providing medical service for the indigent and the medically indigent. The director will be available for consultation with the profession in the formulation of plans, rules and regulations. The resolution submitted to the governor by the council of the state medical association stipulated that all plans provide for freedom of choice of physician, that there should be no restrictions on prescription or treatment except such as are necessary for protection of the public health and, further, that any expenditures made for the expansion of public health and maternal and child health services should not include treatment of disease except so far as this cannot be accomplished through private physicians. Dr. Floyd, a graduate of the University of Louisville School of Medicine in 1915, has been director of the bureau of tuberculosis of the state health department for two years. He formerly practiced in Richmond. He has served two terms in the state legislature. The council's request to the governor for the establishment of the bureau was made at the request of Drs. Irvin Abell, chairman of the committee on public relations; Arthur C. McCarty, chairman of the committee on medical economics, and Elmer L. Henderson, chairman of the committee on the study and provision of medical care of the state medical association, all of Louisville.

LOUISIANA

State Medical Meeting at Alexandria.—The sixtieth annual meeting of the Louisiana State Medical Society will be held at the Bentley Hotel, Alexandria, April 24-26, under the presidency of Dr. Joseph A. O'Hara, New Orleans. The guest speakers will include Judge William H. Byrnes Jr., New Orleans, who will deliver the annual oration; Dr. James C. Masson, Rochester, Minn., on "Carcinoma of the Uterus," and Dr. Sidney A. Portis, Chicago, "Hepatitis: Its Etiology, Diagnosis and Treatment." Among the Louisiana physicians on the program are:

Dr. Maurice Campagna, New Orleans, The Incidence of Peptic Ulcer in the Negro.
Dr. John Preston Davis, Lake Providence, Symptoms, Diagnosis and Treatment of Pellagra with Special Reference to the Use of Nicotinic Acid.
Drs. Dean H. Duncan, Shreveport, and Ernest N. Carmouche, Pineville, Metrazol Therapy in Psychotic Excitement.
Drs. Joseph R. Kriz and Herbert J. Schattenberg, New Orleans, Endometrial Changes and Their Relation to Ovarian Dysfunction.
Dr. Henson S. Coon, Monroe, Use of an Anatomicophysiology Incision in Appendicitis.
Dr. Monte F. Meyer, New Orleans, Fractures of the Malar Bone with Eye, Ear, Nose and Throat Complications.
Drs. Joseph N. Ane and Leon J. Menville, New Orleans, Irradiation Therapy in Endocrine Dysfunction.

The past presidents' dinner will be held Monday evening April 24. Entertainment during the session will include golf and skeet. Other societies planning to meet at this time are the Louisiana Pediatric Society, Louisiana Gynecological and Obstetrical Society, Louisiana Urological Society, the Loui-

siana branch of the National Gastro-Enterology Society and the Louisiana Coroners' Association. There will also be a conference of eye, ear, nose and throat specialists.

MARYLAND

Monthly Meetings on Maternal Mortality.—The Baltimore City Medical Society has adopted a plan to hold monthly meetings to discuss the problems of maternal mortality, the first of which will be held April 27. The plan follows the suggestion of the maternal mortality committee and is akin to the study of maternal deaths in Baltimore which has been conducted for the past three years by a joint committee representing the Baltimore City Medical Society and the city health department. This survey will be continued two more years. In the monthly sessions devoted to this subject, the name of the patient, the name of the physician and the name of the hospital, if death occurred in a hospital, will not be made known. The meetings will be held on the fourth Thursday of each month and will be open to any physician practicing in Maryland.

MASSACHUSETTS

Annual Session of Psychiatry Society.—The New England Society of Psychiatry will hold its annual meeting at the Metropolitan State Hospital, Waltham, April 25. The speakers will include John W. Thompson, Ch.B., Boston, and Dr. William Corwin, Waltham, on schizophrenia.

Society News.—A symposium on the use of physical medicine in orthopedics will be presented before the New England Society of Physical Medicine, Boston, April 26 by Drs. Claude L. Payzant, Howard Moore and Gordon M. Morrison and Lucy G. Marshall, P.T. Dr. Abraham Myerson, Boston, discussed "Combined Physical Therapy and Motivation in the Treatment of the Psychoses" before the society March 15.

Extension Courses.—The Massachusetts Medical Society cooperating with the state department of public health, the U. S. Public Health Service and the U. S. Children's Bureau recently conducted the following extension courses:

- Dr. Meinolph V. Kappius, March 5, Barnstable, Bleeding in the Third Trimester of Pregnancy.
- Dr. Roy J. Heffernan, March 2, Bristol North, Operative Obstetrics.
- Dr. Richard Cannon Eley, February 28, Bristol South, Whooping Cough: The Present Status of Vaccine Therapy Both as Prophylactic and Therapeutic Measure, the Early Diagnosis by Laboratory Procedures, and the Treatment of Complications.
- Dr. Chester S. Keefer, March 2, Hampden, Anemia: Modern Methods in Diagnosis and Treatment of Blood Dyscrasias.
- Dr. Laurence B. Ellis, February 28, Middlesex East, Bright's Disease and Hypertension: Evaluation of New Therapy: Diagnosis.
- Dr. Howard B. Sprague, March 2, Middlesex North, Heart Disease: The Treatment of "Heart Attacks" or "Cardiovascular Emergencies."

The lecturers are all of Boston.

MINNESOTA

Postgraduate Courses.—The third annual series of postgraduate courses for physicians in obstetrics and pediatrics will begin April 26 to continue for five consecutive weeks in ten centers of the state, it is reported. Sponsored jointly by the Minnesota State Medical Association, the University of Minnesota Medical School and the state department of health, the course is financed by social security funds. The schedule of the courses is: April 26, Pine City and Winona; May 3, Fergus Falls and Little Falls; May 10, Willmar and Virginia; May 17, Worthington and Grand Rapids; May 24, Albert Lea and Crookston. There will be one full day meeting in each center, beginning at 8 a. m. and composed of eight lecture and discussion periods, four each on obstetrics and pediatrics.

NEW JERSEY

Society News.—Dr. Edgar Mayer, New York, addressed the Hudson County Medical Society April 4 on early diagnosis of tuberculosis. Dr. Elliott C. Cutler, Boston, addressed the Academy of Medicine of Northern New Jersey, Newark, April 20 on "Postoperative Complications." Dr. Foster Kennedy, New York, will give a lecture at the academy April 27 entitled "A Critique on Present Trends in Medical Education" under the auspices of the academy's committee on public health and medical education and the health committee of the Newark Contemporary. Oscar Riddle, Ph.D., Cold Spring Harbor, N. Y., addressed a meeting of the academy March 16 on "Our Uncontrollable Governor—The Pituitary Gland."—Dr. William G. Leaman Jr., Philadelphia, addressed the Atlantic County Medical Society, Atlantic City, April 14 on "The Prognosis in Heart Disease."

NEW YORK

Women's Medical Meeting.—The Women's Medical Society of New York State will hold its annual meeting in Syracuse April 23-24 under the presidency of Dr. Madge C. L. McGuinness, New York. Papers will be presented by Drs. Sophie Rabinoff, New York, on "Some Health Problems in a District Health Program"; Jane Sands Robb, Syracuse, "Prognostic Significance of the S-T Interval" and Helen G. Walker, Buffalo, "Newer Aspects in the Diagnosis and Treatment of Tuberculosis." Drs. Laura C. Harris, Syracuse, and Marguerite P. McCarthy, Solvay, will present case reports on "Influenzal Meningitis with Recovery" and "Erythroblastic Anemia" respectively. Sunday afternoon the society will give a reception in honor of Dr. William A. Groat, Syracuse, president of the Medical Society of the State of New York, other officers and delegates to the state society.

New York City

The Adam Miller Lecture.—Dr. George Hoyt Whipple, dean and professor of pathology, University of Rochester School of Medicine and Dentistry, delivered the third annual Adam Miller Lecture at Long Island College of Medicine April 6. His subject was "Experimental Anemia and the Building of Hemoglobin in the Body."

Medical Committees for the World's Fair.—Committees in charge of the medical and health exhibits at the New York World's Fair were recently announced. Dr. Livingston Farrand, Brewster, is chairman of the general committee and the following are among chairmen of the subcommittees for the exhibits in the Hall of Medical Science:

- Dr. Arthur W. Booth, Elmira, N. Y., chairman of the Board of Trustees of the American Medical Association, exhibit on medical education sponsored by the Association.
- Dr. Rufus I. Cole, Mount Kisco, N. Y., exhibit on pneumonia, Lederle Laboratories.
- Dr. Kendall Emerson, tuberculosis, Queensboro Tuberculosis and Health Association.
- Dr. Alfred E. Cohn, heart disease, Ciba Pharmaceutical Products, Inc.
- Dr. Francis Carter Wood, cancer, New York City Cancer Committee.
- Dr. William F. Snow, syphilis, Parke, Davis & Co.
- Dr. James Ralph Scott, diabetes, Eli Lilly & Co.
- Dr. Paul Reznikoff, blood diseases and anemia, Eli Lilly & Co.
- Dr. Oswald T. Avery, local and general infections, American Museum of Health, Rockefeller Foundation and Rockefeller Institute for Medical Research.
- Dr. Thomas M. Rivers, filtrable viruses, same sponsors as for local and general infections.
- Dr. Frederick P. Gay, immunity, same sponsors as for local and general infections.
- Dr. Paul M. Wood, anesthesia, Winthrop Chemical Company.

OHIO

State Medical Meeting at Toledo.—The ninety-third annual meeting of the Ohio State Medical Association will be held in Toledo May 3-4 at the Commodore Hotel under the presidency of Dr. Barney J. Hein, Toledo. There will be three general sessions and six section meetings. Part of Wednesday afternoon will be devoted to round table conferences. Guest speakers at the general sessions will be:

- Dr. Anthony J. Lanza, New York, Silicosis—Present Status.
- Dr. Herman O. Mosenhal, New York, Treatment of Nephritis.
- Dr. Elliott C. Cutler, Boston, Preoperative and Postoperative Care.
- Dr. Allen F. Voshell, Baltimore, Important Features in the Treatment of Fractures.
- Bradley M. Patten, Ph.D., Ann Arbor, Mich., Microcinematographic and Electrocardiographic Study of the First Heart Beats and the Beginning of the Circulation in Living Embryos.
- Dr. Elmer L. Sevringhaus, Madison, Wis., Pituitary Therapy.
- Dr. William W. Herrick, New York, Medical Complications of Pregnancy and the Puerperium.

Dr. Francis Bruce Fralick, Ann Arbor, will address the section on eye, ear, nose and throat on "The Muscle Balance in Routine Refractions"; the program also includes the following Ohio physicians:

- Dr. Harry Goldblatt, Cleveland, Experimental Observations on the Treatment of Hypertension.
- Dr. George M. Curtis, Columbus, Lobectomy in the Treatment of Bronchiectasis.
- Drs. Charles S. Higley and Harry Hauser, Cleveland, Diagnosis, Prognosis and Treatment of Hodgkin's Disease.
- Dr. James R. Reeves, Columbus, The Value of Skin Tests as an Aid to Biologic Therapy in Rheumatoid Arthritis.
- Dr. John W. Holloway, Cleveland, Regional Ileitis.
- Dr. William H. Evans, Youngstown, Problems of Nutrition Encountered by the Ophthalmologist and the Otolaryngologist.
- Dr. Theodore T. Zuck, Cleveland, The Application of Recent Knowledge to the Management of Controlled Conditions.
- Dr. Newton W. Kaiser, Toledo, Alcoholic Psychoses.
- Dr. James G. Kramer, Akron, The Present Status of Pertussis Immunization.

Gov. John W. Bricker will speak at the banquet Thursday evening May 4. Another feature will be a public health luncheon sponsored by the section on public health and pre-

ventive medicine Wednesday noon, at which the speakers will be Drs. Carl A. Wilzbach, health officer of Cincinnati, and Roll H. Markwith, Columbus, new state health officer. There will also be a hobby exhibit and the annual golf tournament at the Sylvania Country Club, Toledo, Tuesday May 2.

PENNSYLVANIA

Society News.—Dr. Karl Kornblum, Philadelphia, addressed the Delaware County Medical Society, Chester, April 13 on "Roentgen Examination of the Maternity Patient."—Dr. Wells P. Eagleton, Newark, N. J., addressed the Blair County Medical Society March 28 on medical economics.—Dr. Joseph H. Barach, Pittsburgh, addressed the Fayette County Medical Society, Uniontown, April 6 on "Simplified Treatment of Diabetes."—Dr. Joseph C. Doane, Philadelphia, addressed the York County Medical Society, York, March 18 on "Alcoholism, Its Diagnosis and Treatment."—Dr. Henry T. Price, Pittsburgh, addressed the Harrisburg Academy of Medicine March 21 on "Meningitis in Children."—Dr. Aims C. McGuinness, Philadelphia, addressed the Dauphin County Medical Society, Harrisburg, March 7, on contagious diseases of childhood, with special reference to the uses of convalescent and immune human serums.

Philadelphia

Annual Campaign for Funds.—Philadelphia's annual campaign for funds, known as the "United Campaign" to finance 141 community agencies in welfare work is in progress for March and April. This year's goal is \$4,000,000. It was stated that the fund was forced to cut its appropriations last year because insufficient money was collected.

Gifts to Woman's College.—The Woman's Medical College of Pennsylvania has received the following bequests in recent months: \$25,000 from the late Dr. Jane Jenks Southern; \$15,000 from the estate of Dr. Margaret P. Force-Kuyk, for endowment of the department of preventive medicine; \$5,000 from the estate of Miss Maria Logan, Germantown; \$7,500 from the estate of George Montgomery, New York, to establish a scholarship in the name of his deceased wife, Clara Babbitt Hyde Montgomery, and \$20,000 from the estate of William E. Sellers for care of women and children in the college hospital.

Society News.—A symposium on prevention and early diagnosis of cancer was presented before the Philadelphia County Medical Society April 12 by Drs. Francis Ashley Faught, George E. Pfahler, John O. Bower, Louis H. Clerf, William Edward Chamberlain, Damon B. Pfeiffer and Catharine MacFarlane.—Speakers at a meeting of the Philadelphia Laryngological Society April 4 were Drs. Sol A. Goldberg on "Gangrene and Infection in Ear, Nose and Throat Complicating Diabetes Mellitus"; John B. Price, Norristown, Pa., "The Constitutional Background of Upper Respiratory Infections," and Myron A. Zacks, "Importance of Vestibular Findings Following Head Injuries."

Pittsburgh

Annual Meeting of County Society.—The Allegheny County Medical Society will hold its annual meeting May 2 at the William Penn Hotel with an afternoon scientific session followed by a banquet. The following speakers will appear on the scientific program:

- Dr. Paul A. O'Leary, Rochester, Minn., Latent Syphilis and Wassermann-Fastness.
- Dr. Walter E. Dandy, Baltimore, Diagnosis and Treatment of Lesions of the Cranial Nerves.
- Dr. Wallace M. Yater, Washington, D. C., Heart Diseases Amenable to Surgery.
- Dr. Harry E. Mock, Chicago, General and Special Rules in the Management of Skull Fractures.
- Dr. Fred H. Albee, New York, Surgical Resection of Bone Sarcoma with Immediate Bone Graft Replacement.

Dr. Chauncey L. Palmer, president of the society, will preside, Hon. Cornelius D. Scully, mayor of the city, will make an address of welcome and Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will speak on "American Medicine and the National Government."

SOUTH CAROLINA

Society News.—Dr. Herman J. Moerseli, Rochester, Minn., addressed the Columbia Medical Society March 13 on "Inflammatory Lesions of the Gastric and Duodenal Mucosa: Their Significance in Medical Practice." Dr. Richard B. Josey, Columbia, spoke on "Cardiac Complications of Nephritis in Children."—Dr. Edwards A. Park, Baltimore, addressed the Florence County Medical Society, Florence, February 23 on "Vitamin Deficiencies."

TENNESSEE

The Flexner Lectures at Vanderbilt.—Dr. Albert Szent-Györgi, director of the Institute for Medical Chemistry and professor of medical chemistry, Royal Hungarian Franz Joseph University, Szeged, Hungary, is the guest of Vanderbilt University School of Medicine, Nashville, for two months under the Abraham Flexner Lectureship. During March Dr. Szent-Györgi delivered lectures on general principles of biologic oxidation, respiration of muscle, fermentation and some problems of intermediary metabolism, vegetable respiration and vitamins in health and disease. He is spending April at the university as visiting professor of biochemistry. Dr. Szent-Györgi was the winner of the Nobel Prize in physiology and medicine for 1937. The Flexner Lectureship was established in 1927 by Mr. Bernard Flexner, a brother of Abraham Flexner.

TEXAS

New Health Officers.—Dr. Lee E. Edens recently succeeded Dr. Durwood L. Dodd as health officer of Austin.—Dr. John M. Hooper, Floydada, formerly of Pampa, has been appointed director of public health for district No. 1, which includes sixty counties in the Panhandle and South Plains area.—Dr. Francis T. Isbell, Eastland, has been appointed health officer of Eastland County and Dr. Frank B. Boyle, Big Springs, of Howard County.

VIRGINIA

McGuire Lectures and Postgraduate Clinics.—Dr. Wilder G. Penfield, director of the Neurological Institute, McGill University Faculty of Medicine, Montreal, Canada, will give the McGuire Lectures at the Medical College of Virginia, Richmond, April 27-28 on "Epilepsy, Mechanism and Pathology" and "Epilepsies—Selective Study and Surgical Therapy." A postgraduate seminar on neuropsychiatry will be held on the morning of April 28 with the following speakers: Drs. Hugh C. Henry, Richmond, director of state hospitals and associate in psychiatry at the school; James Asa Shield, associate in psychiatry; Joseph R. Blalock, Marion, associate in psychiatry; Robert Finley Gayle Jr., professor of neuropsychiatry, and George B. Arnold, superintendent of the Capitol State Colony for Feeble-minded and Epileptics, Colony. In the afternoon there will be discussions and demonstrations with the following participants: Drs. Charles Bagley Jr., Baltimore; John M. Meredith, Charlottesville; Claude C. Coleman and William Gayle Crutchfield, Richmond. The lectures will be at the Richmond Academy of Medicine.

WISCONSIN

William Snow Miller Lecture.—Dr. Ko Kuei Chen, professor of pharmacology, Indiana University School of Medicine, and director of pharmacologic research, Lilly Research Laboratories, Indianapolis, delivered the twelfth annual William Snow Miller Lecture at the University of Wisconsin Medical School, Madison, April 6. His subject was "Cyanide Poisoning and Its Treatment."

Society News.—Dr. Loyal Davis, professor of surgery, Northwestern University Medical School, Chicago, gave an address at the University of Wisconsin Medical School, Madison, March 11 under the auspices of Alpha Omega Alpha, on "Experimental and Clinical Experiences in the Surgical Treatment of Hypertension."—Dr. William J. Dieckmann, Beloit, addressed the Rock County Medical Society, Beloit, recently on "Toxemias of Pregnancy."—Dr. Walter G. Sexton, Marshfield, addressed the Winnebago County Medical Society, Oshkosh, March 2 on "Renal Stones."—Dr. Friedrich Eigenberger, Sheboygan, addressed the Sheboygan County Medical Society, Sheboygan, February 28 on "New Laboratory Methods in Diagnosis of Cancer." Dr. Dexter H. White, Milwaukee, addressed the Sheboygan Woman's Club February 21 at the request of the county medical society on "Medical Care."

WYOMING

District Meeting.—The third annual meeting of the Central District Medical Society was held at Casper April 15-16 with the following speakers:

- Dr. Ralph M. Stuck, Denver, Surgical Treatment of Epilepsy.
- Dr. John Harry Murphy, Omaha, Sulfanilamide, Its Use in Infectious Diseases of Children.
- Dr. Atha Thomas, Denver, Treatment of Fractures of the Elbow in Children.
- Dr. William W. Wasson, Denver, Diseases of the Lungs.
- Dr. Paul J. Connor, Denver, Diseases of the Thyroid Gland in Relation to Endocrinology.
- Dr. Clarence B. Ingraham, Denver, Difficult Labors.

GENERAL

The Kober Lecture.—Col. Joseph F. Siler, director of the Army Medical School, delivered the annual Kober Lecture at Georgetown University Medical School, Washington, D. C., March 28, on a new vaccine for typhoid developed by the army. Colonel Siler was presented with a check for \$500, provided under the terms of the Kober Foundation. The speaker for this annual lecture is selected in alternating years by the Medical Society of the District of Columbia, the Association of American Physicians and the Association of Military Surgeons.

Society News.—At the recent annual business meeting of the American Heart Association in New York, the following officers were elected to serve two years: Drs. William D. Stroud, Philadelphia, president; Paul D. White, Boston, vice president, and Howard B. Sprague, Boston, secretary. The twenty-fourth annual meeting of the National Recreation Association will be held in Boston October 9-13. The annual meeting of the Associated State Committees on Postgraduate Medical Education will be held at the Hotel De Soto, St. Louis, May 17, at 12:30 p. m.

Foundation Invites Applications for Grants.—The Dazian Foundation for Medical Research, recently established in accordance with the will of the late Henry Dazian, New York (*THE JOURNAL*, January 21, page 251), is prepared to award fellowships to graduates in medicine for graduate study and research and grants to laboratories, hospitals and similar institutions for research in medicine. Applications and inquiries should be addressed to the Secretary, 180 East Sixty-Fourth Street, New York. The board of directors of the foundation is as follows: Drs. Emanuel Libman, New York, president; Israel Strauss, New York, vice president; Philip Finkle, New York, secretary; Harrison S. Martland, Newark, N. J.; Mr. Emil Friedlander, assistant secretary and treasurer; Mr. William W. Cohen, treasurer, Mr. Alfred L. Rose and Mr. Harold Williams.

Dr. Jelliffe Honored.—The April issue of the *Journal of Nervous and Mental Diseases* is a special anniversary issue commemorating the thirty-fifth year of editorship of Dr. Smith Ely Jelliffe. Commemoration exercises and a dinner were held at the New York Academy of Medicine, April 22. The issue contains reviews of the different phases of Doctor Jelliffe's work, as well as scientific articles. The contributors are Drs. Adolf Meyer, Baltimore, Frederick Tilney, George Draper, New York, Earl D. Bond, Philadelphia, Oskar Diethelm, New York, Abraham A. Brill, New York, Karl A. Menninger, Topeka, Kan., Henry A. Riley, New York, Richard H. Hutchings, Utica, N. Y., and Louis Casamajor, New York. The committee of organization of the ceremonies comprised Doctors Brill, Menninger and Riley, and Drs. Iago Galdston, New York, Bernard Glueck, New York, Benjamin Karpman, Washington, D. C., and Gregory Stragnell, Bloomfield, N. J. The concluding article is entitled "The Editor Himself and His Adopted Child." This is followed by Doctor Jelliffe's bibliography, compiled year by year since 1890 making a total of 411 references.

Survey Office to Be Moved.—Headquarters of the Mental Hygiene Survey Committee, supported by a group of organizations, will be moved July 1 from New York to the U. S. Public Health Service headquarters in Washington in order that the committee's work may be coordinated with that of the mental hygiene division of the service. Offices of the survey committee have been in connection with the National Committee for Mental Hygiene and the work has been carried on with funds provided by the Rockefeller Foundation, the American Psychiatric Association and the public health service. Dr. Samuel W. Hamilton is medical director and Dr. Grover A. Kempf of the public health service is associate medical director of the committee, which was formed in 1936 to survey as many as possible of the 336 mental hospitals in the United States and Canada, to promote research and to encourage wider distribution of teaching facilities. One hundred and sixty-nine institutions in forty states have already been surveyed. Organizations represented on the committee are the American Psychiatric Association, the American Neurological Association, the American Medical Association, the American Board of Psychiatry and Neurology, the National Committee for Mental Hygiene, the U. S. Public Health Service and the Canadian Medical Association.

Societies for Experimental Biology.—The annual meeting of the Federation of American Societies for Experimental Biology will be held at the Royal York Hotel, Toronto, Canada, April 26-29. The federation represents the American

Physiological Society, the American Society of Biological Chemists, Inc., the American Society for Pharmacology and Experimental Therapeutics, Inc., and the American Society for Experimental Pathology. A joint session will be held Thursday morning with the following speakers:

Dr. Eugene M. K. Geiling, Chicago, The Comparative Pharmacology of the Pituitary.
Dr. Maurice S. Jacobs, Philadelphia, Hemolysis, Cell Permeability and Cell Specificity.
Albert Baird Hastings, Ph.D., Boston, Recent Observations on Electrolyte Distribution in Tissues and Body Fluids.
Dr. Thomas M. Rivers, New York, The Nature of Filtrable Viruses.

The physiologists will discuss, among other things, the nervous system, the heart and the circulation, endocrines and metabolism, the digestive secretions, sex hormones, insulin, vitamins and absorption, pituitary, thyroid and thymus, gastrointestinal motility and the liver and the pancreas.

Morton A. Rubin, Ph.D., and Dr. Harry Freeman, Worcester, Mass., Brain Potential Changes During Cyclopropane Anesthesia.
Dr. Kenton R. Phelps, Cleveland, A New Method for the Gradual Occlusion of Coronary Arteries.
Dr. Reginald A. Shipley, Cleveland, The Effect of Anterior Pituitary Injections on the Blood Acetone Bodies of Adrenalectomized Rats.
Dr. Hance F. Haney and Willard C. Roley, B.S., Portland, Ore., Effect of Bile on the Secretion of the Small Intestine.

A joint symposium on chemotherapy will be held by the biochemists and pharmacologists with the following speakers:

Michael Heidelberger, Ph.D., New York, The Scientific Background of the Use of Rabbit Antibody in Pneumonia.
Dr. Eli K. Marshall Jr., Baltimore, Bacterial Chemotherapy with Sulfanilamide-Type Compounds.
George W. Raiziss, Ph.D., Philadelphia, Antipneumococcal Effect of Sulfapyridine and Related Compounds in Mice.
Leonard H. Cretcher, Ph.D., Pittsburgh, Structure and Antipneumococcal Activity in the Cinchona Series.

Among the pharmacologists on the program are:

H. J. White, Baltimore, Relationship Between Temperature and the Streptococcal Activity of Sulfanilamide and Sulfapyridine in Vitro.
Charles R. Linegar, Ph.D., Washington, D. C., Effect of Ergotamine on the Hemodynamic Actions of Acetylcholine.
Frank W. Maurer, Ph.D., Washington, D. C., Further Studies of the Ganglionic and Peripheral Actions of Physostigmine.
Dr. Albert G. Young and Frederick F. Yonkman, Ph.D., Boston, Ethyl Yohimbine in Experimental Hypertension.

Included in the many papers on pathology will be:

Drs. Owen H. Wangenstein and Clarence Dennis, Minneapolis, Experimental Proof of the Obstructive Origin of Appendicitis in Man.
Dr. Marian W. Ropes, Dr. Walter Bauer and William V. B. Robertson, Boston, Enzymatic Hydrolysis of Mucins by a Bacterial Enzyme and by Vitamin C.
Louis D. Greenberg, Ph.D., and Dr. James F. Rinehart, San Francisco, The Stability of Ascorbic Acid in Blood.
Dr. Granville A. Bennett and Morris F. Shaffer, Ph.D., Boston, The Passage of Type III Pneumococci from the Blood Stream into the Joints and Certain Other Body Cavities of the Rabbit.

The pathology section will hold a joint symposium with the immunologists Thursday. Friday there will be a symposium on the chemistry and physiology of red blood cells and on the chemical reactions of vitamins in vivo. The pharmacologic society will conduct a symposium Friday on the mechanics of respiration. Other symposiums include those on proteins, the synapse and carbohydrate metabolism. The annual dinner will be Friday evening.

Government Services

New Veterans' Hospital

President Roosevelt approved a site at Marion, Ill., April 11 for construction of a \$1,400,000 veterans' hospital to serve downstate Illinois, southern Indiana and western Kentucky, it was reported. The new hospital will have accommodations for 500 veterans, including 350 domiciliary patients and 150 receiving hospitalization treatment.

White House Conference on Children

A White House Conference on Children in a Democracy is being organized with President Roosevelt as honorary chairman, Secretary of Labor Frances Perkins as chairman and Miss Katherine F. Lenroot, chief of the Children's Bureau, U. S. Department of Labor, as secretary. The first session will be held at the White House April 26 and the last early in 1940, according to an announcement. Among physicians on the planning committee are Drs. Fred L. Adair, Chicago; Clifford G. Grulee, Evanston, Ill.; Henry F. Helmholz, Rochester, Minn.; Felix J. Underwood, Jackson, Miss.; Midian O. Bousfield, Chicago, and James S. Plant, Newark, N. J.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 25, 1939.

X-Ray Examination in Acute Diseases of Respiratory Tract

At the section of radiology of the Royal Society of Medicine, Dr. Peter Kerley opened a discussion on x-ray examination in acute diseases of the respiratory tract. A portable apparatus was generally necessary. Fine detail was rarely required and speed was important. A working distance of from $2\frac{1}{2}$ to 3 feet was ample. His usual procedure was to let the patient lie back against the screen in the sitting posture. When the shadow of a consolidated base merged with that of the diaphragm or when the respiratory rate was too high or the patient too young or too ill to cooperate, a screen examination might be decisive. As to films, his advice was to take plenty and to overexpose or overpenetrate, since the presence of fluid and consolidation might then be differentiated. A lateral view should always be taken.

The best recognized though not the commonest acute disease of the respiratory tract in childhood was miliary tuberculosis. In infants under 9 months old the usual appearance was a large caseating area of pneumonia in one lung with round foci all over both lung fields; in older children and adults there was a widespread infiltration of millet seed size or larger shadows but seldom a pneumonic area. The significance of the size of the lesions was not clearly established, but he did not believe that the finer and more discrete the lesions the better the prognosis, as had been stated by some authorities.

In pneumonia infants tended to show localization to the paravertebral sulci and older children a more diffuse type of shadow. The dominant feature in infants was a dense homogeneous opacity with an outer border running parallel to the mediastinum from apex to base. The homogeneity of the shadow, the sharp outer border and the distribution transgressed the lobar divisions of the lung and indicated a mediastinal effusion, which appeared to be a frequent complication of paravertebral pneumonia in young children. Between the ages of 2 and 10 years two types of bronchopneumonia could be recognized. In one the foci were large and ill defined and might coalesce but did not extend into the root of the lung, as in lobar consolidation; in the other the foci were sometimes described as miliary bronchopneumonia and appeared to be common after measles. The complications of bronchopneumonia and lobar pneumonia in children were collapse and the presence of fluid. The former could be detected by the low position of the interlobar fissure, the opacity of the lobe and the displacement of the mediastinum to the diseased side. Fluid could be localized, but the roentgenogram did not show whether it was purulent or not. In young children mediastinal effusions were frequent, while in older children the ordinary axillary type was commoner. Empyemas occurred in odd situations and might be overlooked, and sometimes pseudocavities due to acute vesicular emphysema occurred both with lobar pneumonia and with bronchopneumonia in children. All these conditions were difficult even for a skilled radiologist to interpret, and roentgenograms taken by a layman and interpreted by a general practitioner might lead to disastrous results. Ring shadows or pseudocavities in the roentgenograms in cases of lobar pneumonia had been described by American writers and regarded as areas of aseptic necrosis. Rabin regarded them as due to arteritis with thrombosis and infarction. They were a purely radiologic discovery and had never been confirmed post mortem. They might be due to delayed resolu-

tion following collapse of a large segment or lobe. Emphysema was a natural reaction to collapse, and there was no reason why overdistended lobules should not contain fluid levels. In cases of influenzal bronchopneumonia the appearances suggested an area of intense hyperemia with pea-sized foci of consolidation not tending to coalesce.

PARIS

(From Our Regular Correspondent)

March 18, 1939.

Increase in Alcoholism

An article by Dr. G. Lavallée of Paris, which appears in the March 11 *Concours médical*, is entitled "France, the Country of Alcoholism." During the World War some vigorous measures were taken by the government to suppress the sale of absinth and to limit the number of saloons. Although the manufacture of absinth is prohibited, 2,000 new saloons were licensed in 1933. Two years later, distillers of 96 per cent alcohol were given privileges in the way of reduced taxes. This was followed by a rapid increase in the total quantity distilled, so that the population is drinking more and more beverages containing as high as 50 per cent alcohol. The Académie de médecine passed resolutions in 1936 calling the attention of the government to the dangers incident to the increase in drinking and especially to the number of workers who, instead of being benefited by a reduction in the number of working hours to forty a week, were spending their leisure time in saloons. Professor Née of Rouen, in a French department where drinks containing even more than 50 per cent alcohol are commonly taken, stated that at the Hôtel Dieu of that city 220 cases of delirium tremens had been treated from 1935 to 1937 with a mortality of 56 per cent. Many of these patients were not employed and received a daily allowance from the government, most of which was spent in saloons. The Rouen Medical Society at a recent meeting urged the government to take steps immediately to cut down the number of saloons, regulate the manufacture of alcoholic drinks and close the saloons during certain hours as in England and Germany. The production of alcohol has increased from 940,000 hectoliters in 1850 to 4,772,110 in 1935. During the same period, importation of alcohol rose from 5,555 to 692,376 hectoliters. In 1914 only 1,415,000 hectoliters of alcohol in some form was drunk, as compared to 6,149,571 hectoliters in 1935. The net income of the largest two firms engaged in making alcoholic beverages in France has increased 63 per cent and 53 per cent in 1936 as compared to 1935.

Tetanus and Tetaniform Syndromes

The report of cases of tetanus following laparotomy or as a complication of the puerperium often raises the question both as to the aetiology of infection and whether the clinical picture corresponded in every detail to that which it is customary to associate with an infection by the tetanus bacillus. This question was raised by Dr. Pierre Lombard, who read a paper at the January 31 meeting of the Académie de médecine. He stated that patients are admitted to hospitals whose clinical symptoms correspond in every detail to the classic picture of tetanus and yet who show no wound to explain the entrance of the toxin into the body. According to Dr. Lombard there are a number of tetaniform states which cannot be differentiated from tetanus of infectious origin. If a wound is present as a potential aetrium, inoculation of some of the excised tissue into guinea pigs is a far more certain method of finding the tetanus bacillus than cultures. The author reported six cases of children in whom the clinical picture was typical for tetanus and yet animal inoculations were negative. In five of the children only a small superficial abrasion of the skin of some portion of the lower extremity could be found. In the sixth no skin abrasion or other evidence of recent or older injury

could be found. The patient, a boy aged 9 years, complained of a severe pain in the back, which had begun suddenly and subsided as rapidly. Four days later, recurrence of the pain in the back was accompanied by abdominal pain and rigidity of the arms and legs. Two days subsequent to another attack, the child was sent to the hospital with a diagnosis of tetanus. Every five minutes, typical tetanic contractures of the muscles of the lower extremities and abdomen with marked opisthotonos were observed. These attacks did not cease in frequency until large doses of parathyroid extract were given. About three weeks after admission to the hospital there was complete cessation of the tetaniform syndrome.

Primary Tuberculous Infection Reproduced in Monkeys

An important contribution to the method in which children are primarily infected by the tubercle bacillus was reported at the February 14 meeting of the Académie de médecine by Prof. Jean Troisier and Miss Sifferlen. In preliminary experiments they found that when a drop of a culture of tubercle bacilli was instilled into the nose of mice previously anesthetized with ether the acid fast bacilli could be found within three minutes in the pulmonary alveoli. Two minutes later, some of these bacilli were found within the alveolar monocytes even before any phagocytes were visible. For a second series of experiments, monkeys were employed. In animals infected by this method, pathologic changes were found at the end of from one to two months which corresponded in every detail to those observed in primary tuberculous infection of infants. In the lungs, the changes are in general found in the middle and inferior lobe on the side where the bacilli were instilled into the nose. The pulmonary lesions are the size of a pea but are accompanied by a caseous involvement of the tracheo-bronchial lymph nodes. Although no macroscopic signs of involvement of other viscera exists, their inoculation into guinea pigs shows that the tuberculous infection is a generalized one. These experiments were undertaken with the object of proving that infants in contact with tuberculous individuals can during sleep be infected through inhaling air containing tubercle bacilli.

Graduate Courses in English at Paris Hospitals

The faculty of the medical school of the University of Paris in collaboration with the Association des relations médicales and American Medical Society of Paris has organized graduate medical courses given in English. The cost is generally \$6 a lesson, whether taken privately or in a group, and, if there are six students, each one will pay \$6 for the entire course. Special arrangements can be made for courses exceeding a week. Courses in dissection may also be arranged. All graduates will be able, without additional charge, to witness operations or accompany the attending physicians or surgeons of the Paris hospitals on daily ward walks. Daily bulletins, similar to those employed in the larger medical centers of the United States, announce the operations to be performed at about twenty hospitals. These bulletins can, on request, be sent by special delivery to the hotel or boarding house where the graduate is stopping or to the Cité universitaire (Maison américaine), where lodging and meals can be secured at very moderate rates. Thus the graduate can plan his program for the following day, having received the bulletin the preceding evening. The medical school of the University of Paris will grant certificates for graduate work of not less than two months' duration. Arrangements can be made by writing to A. D. R. M. (Salle Bécclard), Faculté de médecine, 12 rue de l'Ecole de médecine, Paris, for private courses in English in rheumatology, otolaryngology, infantile neuropsychiatry, endocrinology, cystoscopy and urethroscopy, neurology, operative technic, parasitology, cardiovascular diseases, pulmonary tuberculosis, gastro-enterology and pediatrics. This is the first

time that a systematic effort has been made here to give graduate courses in English. The clinical material and laboratories are equal if not superior to those accessible to graduates in other parts of continental Europe. The professors giving these courses include many physicians of international reputation.

BERLIN

(From Our Regular Correspondent)

March 6, 1939.

The Development of Bronchoscopy

"Forty Years of Bronchoscopy" is the title of a lecture delivered before the Berlin Medical Society by Professor von Eicken, Berlin ordinarius in otorhinolaryngology. His teacher, Professor Killian, was really the founder of this method. Eicken too, as successor of Killian, has participated in the development of the bronchoscopic technic. After the invention of the laryngoscope by Garcia in 1854, a tube was first introduced into the esophagus by the clinician Kussmaul in 1867. In the exercise of this method one of Kussmaul's pupils placed the tube too far forward and observed the bifurcation of the bronchi. Warnings against introduction of tubes into the respiratory tract were quite common at that time. First in 1897 Killian, then at Freiburg-in-Breisgau, made a practical application of his theories: by means of a specially constructed esophagoscope he removed an aspirated bone from the trachea. Thereafter other interventions of this type were made. The attempt was also made to advance a tracheotomy opening and thus to reach as far as the right inferior lobe. But the direct oral method came to be carried on only after step-by-step perfection of the instrumentation had taken place. In the year 1906 Professor von Eicken himself, who had for long collaborated with Killian, was able to report on 600 successful removals of foreign bodies from the respiratory passages. As the method developed, the attendant difficulties multiplied. In time the profession, growing better acquainted with bronchoscopy, came to recognize that, if an aspirated body could not be quickly removed by the general practitioner, the patient should as soon as possible, namely within the first few hours after aspiration, be placed in the care of a specialist skilled in bronchoscopic technics. At present bronchoscopy is almost an everyday operation; removals of foreign bodies are reckoned in tens of thousands. According to the latest American contributions, however, the removal of foreign bodies represents but a small fraction of the interventions for which bronchoscopy is indicated. In America the method is above all used in the abolishment of postoperative pneumonia. If signs suggestive of pneumonia appear during the first postoperative days, coagulum and mucus are removed with the aid of the bronchoscope and the patients are thus spared the dreaded pneumonic complication. In conclusion von Eicken pointed out that the dense shadows in the roentgenogram after aspiration of foreign bodies may be mistaken for signs of pneumonia. Foreign bodies may produce not only atelectasis but in addition a serous exudation in the alveoli and a venous congestion that is often of high grade. The heavy shadows are based on the sum of these phenomena. The amazingly rapid clearing of the lung picture (often within a few hours) after removal of the foreign body may be explained as due to speedy resorption.

Research on the Pathology of the Liver

Professor Nonnenbruch, Prague ordinarius in internal medicine, discussed his investigations on hepatic disease before the Frankfurt Medical Society. Continuous checking of the residual nitrogen provides a good measuring rod of the course of the illness. Urea and residual nitrogen maintain an interrelation in that the latter diminishes as the urea is increased by oral administration of urea or because of renal insufficiency. Liver extracts can produce the same results; urea is therefore a therapeutic agent capable of promptly abolishing a hepatargic

condition. Residual nitrogen, however, provides no clue to the secret of a coma hepaticum that is unaccompanied by increase in residual nitrogen and rest nitrogen. Coma hepaticum is not accompanied by any characteristic blood picture. Frequently a renal insufficiency participates in this condition; the urea then rises to a high level. In other cases there is a greater increase in residual nitrogen. Many times the potassium values in the blood and the cerebrospinal fluid are greatly elevated, a sign of the subsidence of so-called regulated permeability; but cases of coma hepaticum are occasionally seen in which the potassium value in the serum remains normal. In one case in which massive intravenous injections of dextrose solution were exhibited a "water intoxication" was manifested. Like uremia, coma hepaticum is not to be interpreted in terms of one specific toxin but rather represents a complex of disturbances. The following primary classification may be made on the basis of the blood chemistry: (1) coma hepaticum with increase of the residual nitrogen only (amino-acidemia, azotemia II), (2) hepatorenal coma with azotemia III and (3) coma without azotemia and without significant phenomena in the blood chemistry.

A New Type of Balneotherapy

As every one knows, a search is in progress throughout Germany for new materials that lend themselves to utilization as substitutes. In this connection the following new type of balneotherapy is reported: At Ziegenhals, a small Silesian watering place, so-called wood-pulp slurry (holzschlamm) has been used as a bathing medium for some time. This slurry is a by-product of paper making. The municipality of Ziegenhals has applied to the national patent office for a protective patent of this therapy in the hope that in future the town will be the only place in Germany where visitors with rheumatism and sciatica can be treated with pulp-slurry baths. Last year 5,200 baths of this type were administered. Since Ziegenhals expects a much greater influx of patients during the current year, and since the present accommodations are no longer adequate, a new bath house is to be constructed equipped with at least ten cabinets and having a capacity of from eighty to a hundred baths daily. From the standpoint of economies it is also an interesting fact that the same slurry in which the patients bathe can again be utilized in the manufacture of paper. The foregoing notice is thus far the only extant news with regard to the new use of wood-pulp slurry. No clinical report has been published to date although the new method has received mention in medical journals.

The Nursing Sisters and Tuberculosis

Extensive recent examinations of more than 40,000 members of the nursing sisterhoods have demonstrated that the profession of nursing sisters, despite the fact that its members are exposed to greater dangers than most professionally active women, still is characterized in all parts of Germany by favorable expectation of life. However, in view of the increasing number of occupational illnesses on a tuberculous basis, especially among youthful employees of the tuberculosis wards of hospitals, the establishment of a minimum age limit for permission to work among tuberculous patients has been deemed expedient. Accordingly the accident prevention code of the association of health and welfare employees has been supplemented by a new stipulation to the effect that the care and surveillance of actively tuberculous patients should be entrusted only to healthy persons, capable of resisting infection, who are not less than the age of 25 years. It is also stipulated that the attending physicians and any other persons whose occupation requires contact with tuberculous patients must be in good health and not likely to become infected. The fixing of the age limit at 25 was dictated primarily by the consideration that initial infection with tuberculosis is not only much rarer after the twenty-fifth year of life, but is usually of a milder character, if acquired.

AUSTRALIA

(From Our Regular Correspondent)

March 14, 1939.

Australian and New Zealand Association for the Advancement of Science

The recent meeting of the Australian and New Zealand Association for the Advancement of Science was in part reported in *THE JOURNAL* April 15, page 1520. An illuminating contribution to the medical section was a joint discussion on virus diseases. The discussion centered largely round the controversy as to whether viruses are to be considered independent living organisms or not, and proceeded along two main lines, one suggested by Dr. F. M. Burnet, who has done research on animal viruses at the Walter and Eliza Hall Institute, Melbourne, the other by R. J. Best, M.Sc., of the Waite Agricultural Institute, Adelaide.

Dr. Burnet expressed the view that viruses are essentially independent living organisms. He said that with the present definition of viruses as particulate agents of disease smaller than bacteria and susceptible of being grown only on living cells of a host, it was difficult to believe that there were any natural biologic divisions among the micro-organisms of disease. Certain strictly parasitic bacteria could not be grown apart from living cells, while among the larger "true" viruses were many features of resemblance to bacteria. The nature of viruses could be examined from three points of view: 1. Physicochemical: Complete physicochemical formulation of even the simplest virus was not likely to be attained. 2. Pragmatic: An approach could be made by seeking the working hypothesis best suited to the practical needs of the virus, the research worker, the clinician and the veterinary or plant pathologist. 3. Evolutionary: Here there were three possibilities: (a) the virus was a pathologically active fragment of the cell it parasitized, (b) it represented a surviving form of a precellular stage of evolution or (c) it was a specialized or degenerate descendant of a larger parasitic micro-organism. This third hypothesis seemed to him most likely to be true. It provided an explanation of the graded series from bacteria to the smallest viruses. It was well known that the more highly parasitic bacteria were harder to grow in vitro, produced more specific types of disease, and showed a greater tendency to intracellular growth. The rickettsias were almost certainly derived from bacteria which had developed a symbiotic habit in arthropods. With development of complete parasitism, viruses had lost to a greater or less extent their complement of enzymes and now made use of the enzymes and activated molecules of the host cell. The types of virus now in existence represented various stages in this process of parasitic degeneration.

R. J. Best subscribed rather to the view that viruses represented a surviving form of primordial living matter. He showed that many plant viruses and at least one animal virus had been isolated as proteins and that virus particles had now been obtained which were actually smaller than some protein molecules. While it had not yet been shown that virus properties were not due to some impurity of the protein crystals obtained, this now seemed unlikely. He expressed the view that whereas the protein itself when isolated did not show properties particularly different from any other protein body or phenomena to suggest that it was living, nevertheless when placed in a suitable environment the protein in that environment constituted an independent living system which metabolized and developed at the expense of the normal metabolism of its host and that in such an environment the virus protein reproduced itself at the expense of the energy of its host cell. Countering the argument that such a conception presupposed a higher stage of evolutionary development in the environment and so eliminated the possibility that viruses might represent a primordial form of life, Best replied that viruses were not

recognized only by their biologic activity in their host organism. This did not preclude the possibility that virus proteins existed at the present time in non-living environments since, if they did so, there was no method of recognizing their existence. He concluded by saying that viruses, being a group of living molecules intermediate between the macromolecules of the chemist and the micro-organisms of the biologist, much cooperative investigation from the physical, chemical and biologic aspects was required to elucidate their nature.

TISSUE SPECIFICITY OF INFLUENZA VIRUS

The tissue specificity of influenza virus was discussed by Dora Leish, M.Sc., of the Walter and Eliza Hall Institute, Melbourne. Many viruses, of which the influenza virus was a good example, were rather strictly limited to one particular tissue, in this case the lining of the respiratory tract. This tissue limitation was also shown when the virus was grown on embryonic organs. Influenza virus grew best in the lung of chick and guinea pig embryos, although innocuous to the adults of these species. The more embryonic the tissue, the wider the range of organs that would allow growth. Studies of this kind might throw light on the nature of the interaction between virus and susceptible cell.

PRINCIPLES AND TECHNIC OF PUBLIC EDUCATION

Dr. N. M. Gutteridge, lecturer in bacteriology, University of Queensland, said that the constructive possibilities of science were not fully utilized by the existing social organization, although its destructive possibilities were only too hastily developed. Where science tended to fall short was in its failure to control the interpretation of its advances and their application to society. In modern science lay the hope of civilization, but before society could derive full benefit from the discoveries of science it must find a way of spreading scientific information geared down to the layman's power of understanding. Dr. Gutteridge stressed the growing significance of public education especially in the field of constructive medicine. Unfortunately, the agencies playing the greatest part in public education today were commercial advertising and the films. Between the two a colossal and unrelenting pressure was brought to bear on the public mind, and the advent of organized education in fields such as nutrition and physical education had to contend with this pressure. To develop an enlightened public opinion, we had to learn to speak a new language in order to compete with those other influences dominated by commercial interests. That language must be a dramatic rather than a rational one, and the appeal must come as much through emotion as through reason. The process was largely one of interpretation, and in it well developed radio and film technic could prove a valuable medium. This statement was illustrated by means of the British nutrition film entitled "Enough to Eat" and a dramatized broadcast on nutrition.

HEALTH EDUCATION IN QUEENSLAND

Dr. Gutteridge then described the active public education campaign which had been carried on in Queensland over the last three years under the egis of the Queensland Nutrition Council. Dramatized broadcast sessions on nutrition, on lines similar to those of the health talks conducted by the American Medical Association, had been broadcast regularly twice a week. Frequent articles had appeared in the metropolitan and country press, as well as a six page annual nutrition supplement in the *Courier Mail*. The council had published a "menu-planning chart" and a year book, each of which had been widely distributed, and several courses of lectures on everyday nutrition had been arranged. A weekly dramatized broadcast entitled "Healthward Ho!" had the approval of the Queensland branch of the British Medical Association, and a further weekly session, entitled "The Fitness Forum," dealt with the subject

of physical education. Each of these sessions embodied the modern technic of dramatization. The work had been placed on a sound financial basis by enlisting the support of approved advertisers such as pasteurized milk companies. Already the effect of this education had been noticed in the changing food habits of Queensland people. Reliable figures were difficult to obtain, but commercial companies concerned reported a considerably increased demand in milk, fruit and salad vegetables as well as a specially prepared wheat germ bread over the last two years.

BUENOS AIRES

(From Our Regular Correspondent)

Jan. 1, 1939.

National Congress of Medicine

The sixth National Congress of Medicine took place at Córdoba Oct. 15-21, 1938. This congress meets once every four years. It is organized in several sections, which embrace the various branches of medicine. The general topic was "Organization of Public Health in Argentina." The advisability of making the various departments of public health only a body with a central board of directors was shown. Drs. G. N. Martínez, Gregorio Aráoz Alfaro, E. Bullrich, A. Bidau, Pedro Escudero, Alberto Zwanck and Alfredo Sordelli were speakers.

"Arterial Hypertension" was the topic discussed in the section on internal medicine. Profs. Franz Volhard of Frankfurt, Carl J. Wiggers of Cleveland, Gregorio Marañón of Madrid, B. A. Houssay of Buenos Aires and G. N. Martínez, Temístocles Castellanos and Ramón Brandán of Córdoba were speakers. In the section on dermatology the immediate establishment of regional leprosariums was advised, and the speakers favored the support of the laws concerned with abolishing the recognition and regulation of prostitution. The main topics discussed in the sections on physiology and pharmacology were, respectively, "Sounds of the Heart and Electrical Phenomena of Nervous Energy" and "Agents for Chemical and Sympatheticolytic Transmission."

Annual Congress of Surgery

The Congreso Argentino de Cirugía held its tenth annual reunion Oct. 9-15, 1938, in Buenos Aires with Prof. J. M. Jorge as president. Among the surgeons present were Drs. Brandão, A. Monteiro, J. Poggi, M. Gudín, O. Gualberto, E. Linz, M. de Andrade and Aresky Amorim of Brazil; Luis Vargas Salcedo, E. Paternmann, D'Alessandri, A. Bahauser, Fernández and Vargas Molinare of Chile; J. Mussio Fournier, A. Navarro, D. Pratt, C. Nario, C. Stanjano, V. Armand Ugon and E. Palma of Uruguay; C. R. Gagliardone of Paraguay, and A. Parada of Bolivia. South American surgeons consider it regrettable that North American surgeons do not attend this yearly congress. They would bring important contributions to the congress and at the same time see the progress made by the surgeons of South America.

HYDATID CYSTS

Prof. Oscar Ivanissevich spoke on the first topic, "Hydatid Cysts of the Lung." He advised artificial pneumothorax before the operation when the cyst is small and uninfected. The cyst is slowly evacuated to prevent its rupture in the bronchi or in the pleura. Ninety-two patients with hydatid cysts of the lung underwent operation at the Instituto de clinica Quirúrgica, of which Professor Ivanissevich is a member, and the mortality rate was from 14 to 19 per cent. In ten cases cough or hemoptysis followed the operation. In fifty-five cases residual cavities of the lung were visible on x-ray examination.

MALIGNANT BONE TUMORS

Prof. Oscar Copello introduced the second topic, "Malignant Bone Tumors." He had adopted the Kolodny classification and discussed fifty-three cases, which included thirty of osteogenic

sarcoma, twelve of Ewing's tumors and twenty-one of metastatic tumors. He advised combined surgical and roentgen treatment. Profs. José Guardado and Diego Brachetto-Brian discussed the subject from roentgenologic and anatomopathologic angles.

Diminution in Birth Rate

The birth rate has diminished in Argentina, which is the richest and most prosperous country in South America. From 1887 to 1900 there were forty births for each thousand of population and from 1901 to 1914 thirty-five. The birth rate has diminished still more since the World War. In 1937 there were sixteen births for each thousand of population. In the last few years Buenos Aires, with a population of 2,400,000, has shown an alarming diminution in birth rate.

Personals

Drs. F. Arrillaga, Guillermo A. Boseo, José Valls and R. F. Vaccarezza have been appointed to the chairs of clinical medicine, semiologies, orthopedics and tuberculosis of the Faculty of Medicine of Buenos Aires.

Drs. P. I. Elizalde and Gonzalo Bosch have been appointed members of the Academia Nacional de Medicina of Buenos Aires.

Drs. E. del Castillo, Alfredo Biasotti, Leopoldo Giusti, Gregorio Aráoz Alfaro and O. Orías were appointed official representatives of Argentina to the first South American Congress of Endocrinology at Rio de Janeiro.

Lectures

The following lectures have been delivered in Buenos Aires: Profs. F. H. Quix of Utrecht on the labyrinth; G. Duval of Paris on surgery; Georges Dumas of Paris on psychology; Cesare Frugoni of Rome on medical clinics, Franz Volhard of Frankfurt on renal diseases; Paul Hübschmann of Düsseldorf on pathologic anatomy of tuberculosis; Carl Wiggers of Cleveland on fibrillation, resuscitation and hypertension; H. Arruga of Madrid on detachment of retina; Pedro Ara of Madrid on conservation of anatomic preparations, and Antoine Alajouanine of Paris on neurology.

BUDAPEST

(From Our Regular Correspondent)

March 19, 1939.

Poisoning with Caustic Potash

Dr. G. Faludi reported at a recent meeting of the Interhospital Association on his experience with children suffering from poisoning with caustic potash. Over a period of twenty-three years he treated in the children's wards of St. Stephen's Hospital 1,722 such patients, of whom 938 had acute intoxication and 784 were suffering from esophageal stricture. Of these patients 55.40 per cent were boys and 44.60 per cent girls; 60 per cent were from 1 to 3 years old. Of those with acute intoxication 19.19 per cent died, and of those suffering from stricture 13.40 per cent died. Of those with acute intoxication who died, 83.33 per cent died within three days after admission to the hospital. Ninety-eight per cent of all intoxications were the result of accidents, 1 per cent were suicide and 1 per cent were murder. Strictures most frequently occurred in the middle and the lower third of the esophagus. Dilation with the esophagoscope is not without danger. During the course of the twenty-three years Dr. Faludi met with twenty-six artificial perforations of the esophagus, of which five had occurred before the patient was admitted to the hospital. Early use of the sound must be resorted to with children. It is regrettable, said Faludi, that this method is not as extensively adopted as it deserves, because with it the most severe strictures can be successfully treated. For severe strictures not adapted to treatment with regular sounds, he used Hacker's retrograde treatment with a

thread, preceded by gastrostomy. This treatment sometimes takes years, but even in cases of severe stricture it is conducive to good results.

As treatment is at best unsatisfactory, prevention is more important. This can be accomplished only by applying drastic measures to exclude from households the use of caustics. It is not an uncommon experience for a mother to put the caustic which resembles sugar cubes, into a tumbler of water beside the wash tub and then go to the kitchen to see about cooking the dinner. The small child, seeing the sugar-like thing in the tumbler, drinks it. Such mishaps ten years ago were daily occurrences. Now, through radical changes in packaging of caustic, drastic restriction as to its sale and wide enlightenment of the public, the rate of accidents is decreasing; nevertheless at present Hungary leads in the frequency of caustic intoxication. Faludi appeals to the government to stop the sale of caustic potash.

The Sense of Taste

Dr. Harald Tangl, lecturer at the University of Budapest, in a paper on the sense of taste said that taste is a regressive sense in man, as he tastes only with his tongue while some animals, e. g. fishes, taste with their whole body. An infant tastes with the middle part of his tongue and an adult determines with the sides of his tongue whether food is pleasing or not. The whale has very few taste buds and gulps its food so quickly that it does not bother about the taste. Among home cattle, taste is important, and they scrupulously select the grasses they like. The cow has about 15,000 taste buds, the antelope 50,000 and man 3,000.

We know four distinct tastes: sweet, salty, bitter and sour. The sweet taste is perceived on the tongue the quickest, because the buds reacting on sweets are located at the tip of the tongue; then comes salty and then sour taste. Bitter things are tasted at the back of the tongue. Taste can be regulated. Warm coffee requires less sugar than cold, because warmth is a stimulant to the taste buds. However much sugar is put into ice cream it will not seem too sweet, because when cooled the taste buds scarcely function. If the tongue is rubbed with ice, one fails to perceive different tastes, a good method in taking bitter drugs. Taste is such a fine sense that it cannot be overtaken by chemical procedures. The taste can be trained. Tea tasters are able to tell the place of origin of a tea after a single tasting. Wine tasters can tell from where a certain variety of wine came and also whether the grapes from which it was made grew in a sunny or a shady field.

Marriages

ELIZABETH WASHINGTON KIRBY-SMITH, Sewanee, Tenn., to Mr. David Culbreth Clough of Dover, Del., January 7.

THOMAS EDWARD CAULFIELD JR., Woburn, Mass., to Miss Mary Smith Carroll of Gloucester, Nov. 26, 1938.

THOMAS EDMOND HUGHES, Richmond, Va., to Miss Mary Elizabeth Warren of Delaplane, February 23.

KENNETH L. CARTER, St. Louis, to Miss Frances Elizabeth Ritter of Mattoon, Ill., in December 1938.

DAN ARTHUR JARDINE, Douglas, Ga., to Miss Charlotte Williams of Haddock recently.

DEANE C. EPLER, Detroit, to Miss Kathryn Louise McNeil of Tiffin, Ohio, Nov. 10, 1938.

ROLF VAN K. EGGERS, Seattle, to Miss Kathryn Johnson of San Francisco, Nov. 5, 1938.

RICHARD VINCENT EBERT to Miss Virginia Bordeau Benjamin, both of Boston, recently.

CALVIN G. JACKSON to Miss Mary Lou Johnson, both of Kenton, Ohio, in January.

CLAUDE R. G. FORRESTER to Miss Ruth Emma Johns, both of Chicago, January 5.

Deaths

Alfred Stengel ♂ distinguished physician of Philadelphia and distinguished equally as a medical writer and educator, died at his home in Philadelphia, April 10, aged 70. He had been associated with the University of Pennsylvania as a teacher and administrator for forty-six years.

Dr. Stengel was born in Pittsburgh, Nov. 3, 1868. He received his M.D. degree from the University of Pennsylvania



ALFRED STENGEL, M.D., 1868-1939

in 1889. Soon after graduation he became assistant to Dr. William Pepper. In 1893 he joined the faculty of the University of Pennsylvania as instructor in clinical medicine. In 1896 he became clinical professor of medicine at the Woman's Medical College of Pennsylvania, retaining this position until 1898. He became professor of medicine in the University of Pennsylvania in 1911, and vice president of the university in charge of medical affairs in 1931. In this position he not only supervised the School of Medicine and the Graduate School of Medicine and such auxiliary divisions as the Phipps Institute but also the

Evans Institute of Dentistry and the School of Veterinary Medicine. He was president of the board of the Wistar Institute of Anatomy and term trustee of the University of Pennsylvania, member of the trustees' executive board, and the manager of the Veterinary Hospital.

In his career in medicine he received many honors, including the honorary degree of doctor of laws from the University of Pennsylvania at the 165th anniversary, the honorary degree of doctor of laws from Lafayette College, and the honorary degree of doctor of science from the University of Pittsburgh. His literary contributions to medicine were numerous, including "A Text-Book of Pathology" which went to eight editions between 1898 and 1924. He served as editor at one time of the *American Journal of the Medical Sciences* and was a contributor of various sections or volumes in most of the leading systems of medical practice. Dr. Stengel was editor of the American edition of Nothnagel's *Cyclopedia of Medicine*.

For two terms Dr. Stengel was president of the American College of Physicians and he was a member of the Association of American Physicians, the Philadelphia Pathological Society, and numerous other medical organizations. He was also consulting physician to the Philadelphia General Hospital, the Jewish Hospital, the Abington (Pa.) Memorial Hospital, the Norristown State Hospital, and the Woman's College Hospital. At the time of his death he was actively concerned with the development of a new building for obstetrics and gynecology at the University of Pennsylvania and with new space for a department of neurology.

In the American Medical Association Dr. Stengel served as member of the House of Delegates in 1905 and he had been a member of the editorial board of the *Archives of Pathology*. With his death, medicine lost a great teacher devoted to the highest ideals in the field of medical science, a builder of medical institutions, a man who exemplified in his life and his work the manner in which the physician may contribute in the highest degree to the advancement of his profession.

Angus McLean ♂ emeritus professor of surgery at Wayne University College of Medicine, died at his home in Detroit on April 11 of carcinoma of the stomach, aged 76. He had a long and distinguished career in the field of medicine and was equally notable for his service as a great citizen of Detroit.

Dr. McLean was born in St. Clair, Mich., April 4, 1862. He graduated from the Collegiate Institute of Strathroy, Ontario, in 1880 and received his M.D. degree from the Detroit College of

Medicine in 1886. Later he served in various capacities in the city and state government, holding at different times the position of city physician, quarantine inspector for the Port of Detroit, member of the state board of health and member of the city board of health. In his work in the field of medicine he was past president of the Wayne County Medical Society and the Michigan State Medical Society and was first president of the Detroit Academy of Surgery. He was appointed in 1905 to serve on the state board of health and in 1911 was made a member of the Detroit Board of Health.

During the World War he organized and was commanding officer of the Harper Base Hospital No. 17 in France and was cited for heroic work in the American Expeditionary Forces. He became president of the Medical Commission and was sent to Italy in October 1917. Later he was transferred from hospital duty and appointed special surgeon to the Peace Commission in France. By special order of General Pershing, he accompanied President Wilson on his homeward journey in February 1919. The War Department conferred on him the Distinguished Service Medal. In 1927, he was one of four physicians appointed by President Coolidge to attend the Military Medical Congress at Warsaw, Poland, at which time the President of Poland presented him with a medal on behalf of the Polish Army Officers' Medical School of Warsaw. He was also made honorary professor of medicine by the University of Warsaw.

In 1929, he was one of five physicians appointed by President Hoover to represent the United States in the Fifth International Congress of Military Surgeons at London and at the Royal Institute of Public Health at Zurich, Switzerland. For his work abroad he was recognized by the award of the Chevalier of the French Legion of Honor. He was also made an honorary member of the Federation of Soldiers of France and a member of the Société Française. In 1936, he was awarded the Order of Knight Commander of the Crown of Italy.

Dr. McLean was conspicuous in the general field of education, having been a member of the Detroit Board of Education since 1923, and president of the board in 1935. He served as chairman of the Michigan committee for the relief of German children and was decorated by the German government for this work.

In his work in surgery he made numerous scientific contributions to surgical periodicals. He was consulting surgeon to the Children's Free, Woman's, St. Joseph's McCreary, Receiving and Providence hospitals and the Florence Crittenton Home.

Dr. McLean's career was an exemplification of the opportunities that America has offered in the past and how a young man may rise from humble beginnings. His father was a farmer. Dr. McLean, at various times in his career, was a lumber mill employee, a dock hand, a ship's watchman, a Great Lakes sailor and a pilot. He retained his interest in sailing, having his own yacht. He took part in every activity for the advancement of his community and for the development of his profession.

William Belfry Hendry, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1904; professor emeritus of obstetrics and gynecology at his alma mater; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons and the American Gynecological Society; fellow of the American College of Surgeons, Royal College of Surgeons of Canada and the British College of Obstetricians and Gynecologists; served during the World War; consultant in obstetrics to the Toronto Board of Health and Federal Board of Health; consultant in obstetrics and gynecology to the Provincial Board of Health; on the staff of the Toronto General Hospital; aged 64; died, March 24, of leukemia.



ANGUS McLEAN, M.D., 1862-1939

James Francis Lynch ☉ Hartford, Conn.; College of Physicians and Surgeons, Baltimore, 1913; fellow of the American College of Surgeons; aged 46; attending surgeon to St. Agnes' Home and House of the Good Shepherd; consulting surgeon to the Hartford Neuro-Psychiatric Institute and Hospital; consulting supervisor of surgery, Veterans Administration Facility, Newington; attending surgeon to St. Francis Hospital, where he died, January 7, of gastric hemorrhage.

Arthur Daniel Kurtz ☉ Philadelphia; Jefferson Medical College of Philadelphia, 1908; formerly associate professor of orthopedic surgery at Temple University School of Medicine; member of the American Academy of Orthopedic Surgeons; fellow of the American College of Surgeons; on the staffs of the Misericordia Hospital, Jefferson Hospital and the Homewood School; aged 52; died, January 21, of essential hypertension and acute hemorrhagic nephritis.

Francis D. Pringle ☉ Punxsutawney, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1903; past president of the Jefferson County Medical Society; for many years president of the city board of health and of the board of education; for fifteen years county health officer; aged 67; on the staff and formerly superintendent of the Adrian Hospital, where he died, January 29, of uremia.

William Lee Helms, Taylor, Texas; Louisville (Ky.) Medical College, 1904; member of the State Medical Association of Texas; past president of the Williamson County Medical Society; formerly city health officer and member of the school board; on the staff of the Wedemeyer Hospital; aged 68; died, January 2, in a hospital at Temple of injuries received in an automobile accident.

Arthur Guernsey Root, Albany, N. Y.; Albany Medical College, 1890; member and past president of the Medical Society of the State of New York; at one time professor of diseases of the throat and nose at his alma mater; member of the American Laryngological, Rhinological and Otolological Society; formerly on the staff of the Albany Hospital; aged 71; died, February 26, of myocarditis.

Hugh Forsythe Lorimer ☉ Englewood, Colo.; Columbus Medical College, 1883; in 1908 member of the House of Delegates of the American Medical Association; past president of the Ross County (Ohio) Medical Society; formerly member of the state board of health; aged 81; died, January 9, in the Presbyterian Hospital, Denver, of chronic myocarditis and paralysis agitans.

William Converse Kendall, Freeport, Maine; Georgetown University School of Medicine, Washington, D. C., 1896; for many years associated with the U. S. Bureau of Fisheries; was a member of the MacMillan Arctic Expedition; aged 77; died, January 28, in a hospital at Mobile, Ala., of intestinal obstruction and carcinoma of the rectum.

Brayton Eugene Kinne, Albany, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1901; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; visiting surgeon to the Memorial Hospital; aged 61; died, January 23, of arteriosclerosis, endarteritis obliterans and coronary disease.

George Quincy Johnson, Ardsley, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1882; member of the Medical Society of the State of New York; medical officer of the public schools; aged 79; on the staff of the Dobbs Ferry (N. Y.) Hospital, where he died, January 23, of coronary thrombosis.

Maurice Louis Goodkind ☉ Chicago; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1889; professor of medicine at the University of Illinois College of Medicine; served during the World War; for many years on the staff of the Michael Reese Hospital; aged 71; died, January 4, of coronary occlusion.

Arthur Ernest Hale ☉ Alva, Okla.; University of Kansas School of Medicine, Kansas City, Kan., 1913; past president of the Woods County Medical Society; served during the World War; aged 52; on the staff of the Alva General Hospital, where he died, January 11, of gas bacillus infection, following operation for ruptured diverticulum.

Willis Harland Flamm, Amarillo, Texas; John A. Creighton Medical College, Omaha, 1908; member of the State Medical Association of Texas; past president of the Potter County Medical Society; on the staffs of the Northwest Texas Hospital and St. Anthony's Hospital; aged 56; died, January 8, of heart disease.

William Wallace Larsen, ☉ Le Mars, Iowa; State University of Iowa College of Medicine, Iowa City, 1913; member of the Iowa State Medical Society and the Radiological Society

of North America; on the staff of the Sacred Heart Hospital; aged 55; died, January 19, of rhabdomyosarcoma with metastasis.

James Elmer Donnell, Cuba City, Wis.; Illinois Medical College, Chicago, 1907; member of the State Medical Society of Wisconsin; past president of the Grant County Medical Society; served during the World War; aged 62; died, January 19, in Dubuque, Iowa, of intestinal obstruction and carcinoma of colon.

John Frank Hastings ☉ Kenosha, Wis.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1906; past president and secretary of the Kenosha County Medical Society; on the staff of the Kenosha Hospital; aged 61; died suddenly, January 17, in Chicago, of chronic myocarditis.

Henry Wellington Cook, Hicksville, Ohio; Western Reserve University Medical Department, Cleveland, 1895; member of the Ohio State Medical Association; formerly member of the board of education of Hicksville and of the county board of education; aged 73; died, January 7, of bronchopneumonia.

Margaret Rodgers James, Allentown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1929; member of the Medical Society of the State of Pennsylvania; on the staff of the Allentown Hospital; aged 35; was found dead, January 21, of injuries received in an automobile accident.

Joseph Edward Evans ☉ P.A.S., Lieutenant, U. S. Navy, Charleston, S. C.; Harvard University Medical School, Boston, 1927; fellow of the American College of Surgeons; entered the navy in 1927; served during the World War; aged 40; died, January 25, in the United States Naval Hospital.

Raymond Barzillia Burr, Blair, Neb.; University of Nebraska College of Medicine, Omaha, 1927; member of the Nebraska State Medical Association; served during the World War; aged 42; died, January 9, in the Immanuel Hospital, Omaha, of coronary occlusion and arteriosclerosis.

Augustus William Hendricks, Allentown, Pa.; Jefferson Medical College of Philadelphia, 1893; member of the Medical Society of the State of Pennsylvania; past president of the Lehigh County Medical Society; formerly city health officer; aged 70; died, January 31, of coronary embolism.

Clarence Paul Johnson, San Antonio, Texas; Baylor University College of Medicine, Dallas, 1929; member of the State Medical Association of Texas; on the staffs of the Nix and Robert B. Green Memorial hospitals; aged 38; died, January 14, when he fell from a twenty-one story window.

Marshall McDowell ☉ Cynthia, Ky.; Medical College of Ohio, Cincinnati, 1894; treasurer of the Kentucky State Medical Association; past president of the Harrison County Medical Society; on the staff of the Harrison Memorial Hospital; aged 66; died, January 26, of cerebral hemorrhage.

George Hazard Crooker ☉ Providence, R. I.; Harvard University Medical School, Boston, 1893; veteran of the Spanish-American and World Wars; formerly on the staff of the Rhode Island Hospital; aged 73; died, January 12, of coronary thrombosis and bronchopneumonia.

John Alexander Jackson, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1887; member of the Medical Society of the State of New York; aged 77; died, January 11, in St. Joseph's Hospital, Tampa, Fla., of cerebral hemorrhage.

George Stillman Clark, Worcester, Mass.; Harvard University Medical School, Boston, 1885; member of the Massachusetts Medical Society; aged 79; died, January 26, in the Memorial Hospital of arteriosclerotic gangrene followed by amputation of the left leg.

Francis Orman Hill, Monticello, Maine; Medical School of Maine, Portland, 1899; past president of the Arrostook County Medical Society; formerly member of the state legislature; aged 66; died, January 2, of coronary occlusion and cerebral hemorrhage.

William Henry Emery, Boston; Harvard University Medical School, Boston, 1870; member of the Massachusetts Medical Society; Civil War veteran; aged 90; died, January 21, in the Veterans Administration Facility, Bedford, Mass., of myocarditis and arteriosclerosis.

William T. Fitzgerald, Greenville, Ohio; Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1891; formerly congressman; aged 79; died, January 12, of arteriosclerosis and streptococcal throat infection.

Guy Goodwin Fernald, West Concord, Mass.; Dartmouth Medical School, Hanover, N. H., 1899; member of the Massachusetts Medical Society; for many years on the staff of the Massachusetts Reformatory Hospital; aged 74; died, January 21,

Charles Whitefield Clark, Toronto, Ont., Canada; Hahnemann Medical College and Hospital, Chicago, 1866; Homeopathic Medical College of Missouri, St. Louis, 1867; aged 93; died, January 8, of carcinoma of the pancreas and duodenum.

Earle Wayne Cliffe, Youngstown, Ohio; Cleveland Homeopathic Medical College, 1909; member of the Ohio State Medical Association; served during the World War; aged 54; died, January 31, in St. Elizabeth's Hospital of angina pectoris.

Charles Alexander Eastman, Detroit; Boston University School of Medicine, 1890; at one time inspector in the Indian Service of the U. S. Department of Interior; aged 80; died, January 8, of bronchopneumonia and chronic myocarditis.

John W. Cooper, Kempton, Ind.; Physio-Medical College of Indiana, Indianapolis, 1884; member of the Indiana State Medical Association; aged 80; died, January 23, in St. Francis Hospital, Beech Grove, of carcinoma of the stomach.

William E. Howell, Gallipolis, Ohio; Medical College of Ohio, Cincinnati, 1897; member of the Ohio State Medical Association; formerly county health officer; aged 70; was found dead in his automobile January 21, of heart disease.

Mark Jacob Gottlieb, New York; University and Bellevue Hospital Medical College, New York, 1909; on the staffs of the Beth Israel Hospital and the Hospital for Joint Diseases; aged 53; died, Dec. 21, 1938, of heart disease.

William Levi Ward, Victoria, Texas; University of Louisville (Ky.) Medical Department, 1880; aged 86; died, Dec. 27, 1938, in a local hospital of cerebral injuries received in an accidental fall down the stairway of his home.

George Benjamin Henke, Ontario, Calif.; Hahnemann Medical College of the Pacific, San Francisco, 1913; on the staff of the San Antonio Community Hospital, Upland; aged 54; died, January 25, of coronary occlusion.

Earl Berton Fitzpatrick, Martinez, Calif.; Oakland (Calif.) College of Medicine and Surgery, 1910; served during the World War; aged 51; died, Dec. 9, 1938, in the Community Hospital of tuberculosis of the bladder.

Frederick Leslie Dod, Kansas City, Mo.; University Medical College of Kansas City, Mo., 1904; member of the Missouri State Medical Association; served during the World War; aged 62; died, January 30, of pneumonia.

Arthur Wayland Howard, Wethersfield, Conn.; University of the City of New York Medical Department, 1890; member of the Connecticut State Medical Society; aged 71; died, January 16, of coronary thrombosis.

Theodore A. Erck, Leesburg, Fla.; University of Pennsylvania Department of Medicine, Philadelphia, 1892; fellow of the American College of Surgeons; aged 75; died, January 10, of carcinoma of the mesentery.

William F. Finney, Trenton, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1874; aged 90; died, January 18, in St. Francis Hospital of prostatic hypertrophy and bronchopneumonia.

George W. Clayton, Laurel, Miss. (licensed in Mississippi in 1906); member of the Mississippi State Medical Association; on the staff of the Laurel General Hospital; aged 57; died, January 13, of angina pectoris.

Julius Arthur Doshier, Southport, N. C.; Baltimore Medical College, 1903; served during the World War; aged 59; on the staff of the Brunswick County Hospital, where he died, January 10, of pulmonary tuberculosis.

John Clifton, Vermillion, Kan. (licensed in Kansas in 1901); member of the Kansas Medical Society; formerly county health officer; aged 74; died, January 16, in Topeka of myocardial and renal insufficiency.

Rufus Peabody Hubbard, New York; Harvard University Medical School, Boston, 1883; aged 82; died, January 7, in St. Luke's Hospital of chronic glomerular nephritis and lobar pneumonia.

Clarence Denver Potter, San Francisco; Hahnemann Hospital College of San Francisco, 1896; member of the California Medical Association; aged 66; died, Dec. 8, 1938, of arteriosclerosis.

Horace Everett Doughty, Oxford, Maine; Baltimore Medical College, 1909; formerly member of the school board; aged 65; died, January 28, of nephritis and diabetes mellitus.

Jesse Willis Amey, Schenectady, N. Y.; University and Bellevue Hospital Medical College, New York, 1907; aged 67; died, January 11, in Miami, Fla., of cerebral hemorrhage.

Davis Leslie Askren, Fayoum, Cairo, Egypt; Central Medical College of St. Joseph, Mo., 1896; medical missionary; aged 65; died, January 18, of heart disease and emphysema.

Louis Philippe Dumont, Montreal, Que., Canada; Laval University Faculty of Medicine, Quebec, 1919; aged 43; was found dead, January 7, of poison, self administered.

Charles L. Baskin, Bremen, Ga.; Atlanta Medical College, 1895; member of the Medical Association of Georgia; aged 69; died, January 13, of uremia and paralysis agitans.

Patrick Joseph Brice, New Castle, Pa.; Jefferson Medical College of Philadelphia, 1907; aged 62; died, Dec. 17, 1938, in the New Castle Hospital of coronary occlusion.

Wilmer Kieffer Maglaughlin, Altoona, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1890; aged 71; died, Dec. 23, 1938, of cerebral hemorrhage.

Anna Beauregard Searcy Bourne, Springfield, Mo.; University of Missouri School of Medicine, Columbia, 1900; aged 76; died, January 14, of coronary thrombosis.

Daniel Burleigh Parkhurst, Ogunquit, Maine; Hahnemann Medical College and Hospital of Philadelphia, 1900; aged 79; died, Dec. 29, 1938, in Boston of myocarditis.

Joseph Leal d'Azevedo, Oakland, Calif.; College of Physicians and Surgeons, San Francisco, 1901; aged 63; died, Dec. 18, 1938, of arteriosclerotic heart disease.

John Aloysius Barry, Boston; Georgetown University School of Medicine, Washington, D. C., 1891; aged 77; died, Dec. 9, 1938, of carcinoma of the intestine.

George Howard White, Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1906; aged 57; died, Dec. 21, 1938, of carcinoma of the colon.

Charles Cochran Kemble, Erie, Pa.; Jefferson Medical College of Philadelphia, 1897; aged 62; died, Dec. 24, 1938, in St. Vincent's Hospital of liver abscess.

Oliver R. Fore, Canton, Miss.; Atlanta College of Physicians and Surgeons, 1902; served during the World War; aged 63; died, Dec. 23, 1938, of gastric ulcer.

Cassius M. Clay, Milton, Fla.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1897; aged 83; died, Dec. 26, 1938, of endocarditis.

Aslak Milo Boe, Northfield, Minn.; University of Minnesota Medical School, Minneapolis, 1926; aged 40; died, January 8, of pulmonary tuberculosis.

Elizabeth Fear Leffingwell, Aurora, N. Y.; University of Buffalo School of Medicine, 1888; aged 76; died, Dec. 21, 1938, of carcinoma of the intestine.

Dilly Nelson Pattison, Oelwein, Iowa; State University of Iowa College of Medicine, Iowa City, 1897; aged 62; died, Dec. 26, 1938, of coronary sclerosis.

B. Cornelison, Louisville, Ky.; Keokuk (Iowa) Medical College, 1891; aged 87; died, Dec. 29, 1938, at the Norton Infirmary of cerebral hemorrhage.

Howard Nelson Nason, Mill River, Mass.; College of Physicians and Surgeons, Boston, 1909; aged 61; died, Dec. 12, 1938, of carcinoma of the prostate.

Philip T. Leighly, Hebron, Ind.; Kentucky School of Medicine, Louisville, 1888; aged 78; died, Dec. 31, 1938, of nephritis and chronic prostatitis.

Allen Bonebrake, Goldendale, Wash.; Willamette University Medical Department, Portland, Ore., 1883; aged 86; died, Dec. 31, 1938, of cerebral anemia.

Edwin Carman, Freeport, N. Y.; Long Island College Hospital, Brooklyn, 1889; aged 71; died, January 8, of chronic glomerular nephritis and uremia.

William Waldron Ware, Stanton, Tenn.; Vanderbilt University School of Medicine, Nashville, 1899; aged 65; died, Dec. 8, 1938, of arteriosclerosis.

William Allenson Greer, Fountain City, Tenn.; Vanderbilt University School of Medicine, Nashville, 1897; aged 67; died, Dec. 19, 1938, in Sebring, Fla.

Charles A. Monroe, Oakland, Calif.; Cleveland Medical College, 1895; aged 68; died, Dec. 13, 1938, of chronic myocarditis and pulmonary edema.

Charles William Haentschel, Haileybury, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1888; aged 78; died, Dec. 15, 1938.

Charles P. Hemphill, Sweetman, Miss.; Louisville (Ky.) Medical College, 1884; aged 81; died, January 28, of pneumonia.

Orlo L. Mapes, Lakeside, Ohio; American Eclectic Medical College, Cincinnati, 1886; aged 79; died, Dec. 23, 1938.

John W. Roark, Roanoke, Texas (licensed in Texas, under the Act of 1907); aged 66; died, Dec. 17, 1938.

S. D. Caver, Limflat, Texas (licensed in Texas, under the Act of 1907); died in December 1938.

Correspondence

"RELATION OF PHYSICAL EXERTION AND EMOTION TO PRECIPITATION OF CORONARY THROMBI"

To the Editor:—In an article entitled "Relation of Physical Exertion and Emotion to Precipitation of Coronary Thrombi" in THE JOURNAL, March 11, Dr. J. C. Paterson categorically stated that coronary thrombi are precipitated by exertion and emotion. This is contrary to our observations previously published in THE JOURNAL and elsewhere.

In the summary the author states that "activities of a patient immediately preceding the onset of an attack of coronary thrombosis have no relation to the etiology of the precipitation of a thrombus but are purely coincidental." Yet the very next sentence is "The pathologic appearances in a series of fatal cases of coronary thrombosis suggest strongly that exercise and emotional stress are intimately concerned in the mechanism of coronary artery thrombosis." These statements are contradictory.

If the author means unusual activities a few hours to a few days prior to the closure rather than the activities immediately preceding it, we have his statement with regard to his two cases that "both persons were pursuing their ordinary activities until just before their fatal attacks, and patient 2 was known to have been without complaints and in good spirits three and one-half hours before his death." Hence the author cannot believe that effort immediately or sometimes before the occlusion was a factor.

Although the author states that "on purely pathologic grounds there is reason to believe that such physical and mental states, both of which result in temporary hypertension, cannot be excluded as precipitating factors of coronary thrombi," he actually gives purely theoretical arguments but neither pathologic nor clinical evidence. Our belief that coronary artery occlusion is not related to activity or emotional stress was based on carefully elicited histories in 800 ward and private cases and not on theoretical discussion of blood pressure.

The author assumes that subintimal hemorrhage, with which it is now agreed coronary occlusion is usually associated, is produced by exertion or emotion resulting in an increase in blood pressure in the subintimal capillaries. There is no proof for this assumption. Leary and other investigators have shown, and Paterson himself has corroborated, that subintimal hemorrhages are part of the progressive arteriosclerotic process in the coronary arteries; it is unnecessary to invoke a rise in blood pressure to explain them. As a matter of fact, Winternitz found it necessary to perfuse the coronary arteries at pressures of from 500 to 1,000 mm. of mercury in order to outline the subintimal capillaries. In spite of these enormous pressures, far beyond any figure attained in hypertension, rupture of the capillaries did not occur, although severe coronary sclerosis was present. Furthermore, we have now collected a group of forty patients who because of the presence of carcinoma, heart failure and the like had been in bed for weeks or months prior to the attack of coronary artery occlusion. In spite of the absence of effort in such persons, subintimal hemorrhage was just as common as in others going about.

Paterson's two cases indicate that in some instances a varying period may elapse between the onset of thrombus formation and the clinical attack. This is not a new idea at all, having been noted by a number of writers including Levy and Bruenn in THE JOURNAL in 1936. We realized therefore that it was necessary to know the activity of the patient for some time prior to the acute episode, and in the last 250 cases we have analyzed the activities of the patient during the entire four weeks prior to the attack. These data have confirmed our belief that activity

plays no role in precipitating coronary thrombosis. Not only did the attack begin at rest, as a rule, but there was no history of undue exertion or emotion previously. The occurrence of coronary artery occlusion in the forty patients who had been bedridden for weeks and months is confirmatory evidence of this.

It seems reasonable to us to collect clinical facts and to correlate them with the pathologic observations or with some tested physiologic mechanism. Paterson has completely ignored the clinical facts. These can be obtained by any one who takes a detailed history of the events preceding an attack of coronary artery occlusion. He will be struck by the fact that classic coronary artery occlusion almost invariably occurs in the absence of effort, excitement and trauma. In 1,400 cases we found the activities associated with coronary artery occlusion as follows.

Sleep	22.3	} 53.4%
Rest	31.1	
Mild activity	20.2	} 44.5%
Moderate activity	8.5	
Walking	15.8	
Unusual exertion	2.0	2.0%

This trifling association of coronary artery occlusion with unusual exertion eliminates it as a factor in the precipitation of the attack; otherwise coronary artery occlusion should occur very much more frequently for all of us, including those with coronary artery sclerosis who exert themselves during the day. If effort or excitement were a factor in the onset of coronary occlusion, sufferers from coronary sclerosis would never dare to move, read a newspaper or listen to the radio.

Since coronary artery occlusion occurs usually at rest or during sleep, it is even possible to explain subintimal hemorrhage on the basis of a drop in blood pressure and not on a rise, as Paterson assumes. It has long been known that, in shock with a fall of blood pressure, capillary hemorrhages are present throughout the body. In patients with severe coronary sclerosis, bleeding from an ulcer, for example, may produce coronary insufficiency and death. There is a fall of blood pressure concomitant with the exsanguination and yet fresh subintimal hemorrhages may be found post mortem.

We found not only that physical activity or emotional stress was not a factor in the onset of coronary artery occlusion but that occupation also played no role, attacks being equally common in laborers and persons engaged in sedentary occupations. This further corroborates our belief.

ARTHUR M. MASTER, M.D.
SIMON DACK, M.D.

HARRY L. JAFFE, M.D.
New York

TUMORS IN TWINS

To the Editor:—I am making an analysis of records of tumors in twins and would be glad if you could lend me assistance by publishing this appeal for information to the medical profession of America:

A number of records have been published of tumors occurring in one or both members of a pair of twins. There is a divergence of opinion as to the conclusions that can be drawn from such reports. I am therefore asking all members of the profession who have had occasion to diagnose or treat tumors, either benign or malignant, in either one or both members of a pair of twins to communicate with me, giving the following information as far as possible:

Twin 1.	Name	Sex	Tumor?	Site	Type
	Age of onset		Age at death	Age, if still living	Age, if still living
	Was there operative or pathologic confirmation of the diagnosis?				
Twin 2.	Same information.				

If the twins were of the same sex, were they so similar in appearance as to cause confusion in identity or were they dissimilar?

Those cases in which only one twin was affected are just as important as those in which both twins have the tumor. The names are important but will be kept confidential, because if the same person was treated by several physicians, all of whom were to send in information, the name would aid in checking the fact that there was a duplication. The age at the time tumor arose and the age at death or at which the twins are still living is of great importance also. If the tumor began in twin 1 six months ago and twin 2 has not yet shown it, the short duration of time must be considered in evaluating the record; but if the second twin has lived twenty years without the tumor developing, that point should be noted. Because there are not many available records of tumors in twins, I appeal to all members of the profession who read this note to send to me as soon as possible any data which they have on tumors in twins.

MADGE THURLOW MACKLIN, M.D., LL.D.,
London, Ont.

Assistant Professor of Histology and Embryology,
Medical School, University of Western Ontario.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

VITAMINS IN GREEN AND RIPENED FRUITS

To the Editor:—What difference is there in the vitamin potency of tree-ripened fruit and fruit picked green and allowed to ripen?

LEONARD T. CARLSON, M.D., Minneapolis.

ANSWER.—This question cannot be answered categorically because there is a paucity of information on the subject and other important considerations are implied by the question. Most of the studies relating to ripening of fruits and the vitamin content have been made on tomatoes and oranges, and some of them have been confined to vitamin C. It has been reported that fully matured but green tomatoes are lower in vitamin A and vitamin C than vine-ripened fruit and that green fruit when ripened in the air shows some increase in vitamins A and C but does not acquire the same vitamin content as tomatoes ripened on the vine. There appear to be no important changes in the vitamin B content during the process of ripening, irrespective of method.

Two rather extensive studies on oranges show that if the fruit is picked in the early stages of maturity (state laws require that a certain acid-sugar ratio must be reached in the juice before interstate shipment is permitted) the vitamin C content of the juice is fully equal to that reached at any later stage of maturity.

Treatment with ethylene gas or the gas from oil heaters is extensively used to change the color of immature fruit to that of naturally ripened fruit. It appears that the only important change produced by this treatment is a bleaching of the chlorophyll so that the color of naturally ripened fruit is produced. This process does not alter the vitamin content of the fruit.

The generalization may be made that fruit shows a lowering of vitamin C during storage, but there are no important changes with respect to the other vitamins. It is improbable, however, that the metabolic changes during storage proceed to an important degree during the period required for ripening after the fruit has been picked. It is not possible to state with assurance that from a practical standpoint there is a measurable advantage in consuming fully tree-ripened fruit as compared with fruit picked at such a stage of maturity that it can be ripened off the tree.

The vitamin C content of fruits is discussed in the paper "Vitamin C Methods of Assay and Dietary Sources" by Otto A. Bessey, *THE JOURNAL*, Oct. 1, 1938, page 1290.

SALT SUBSTITUTES AND NEPHRITIS

To the Editor:—Is it the sodium or chloride ion that is advised against in the treatment of renal conditions associated with edema? I thought it was the sodium ion that was the detrimental factor. If the sodium factor, then would not that be contraindicated in the use of commercial "Curtasal"-Winthrop? This is advised for use to flavor foods when the use of salt is not advised. It contains, they say, "sodium formate with the addition of a small amount of magnesium citrate and calcium formate." What might one use advantageously to flavor foods when regular salt is not advised?

M.D., Wisconsin.

ANSWER.—The early work on the relation between salt retention and edema laid undue emphasis on the chloride ion, largely because of the difficulty of analyzing for sodium. When it was later demonstrated that potassium chloride, calcium chloride and ammonium chloride actually produced diuresis in edematous patients, emphasis was shifted to the cation sodium. Further work on clinical and experimental states of dehydration and hydration, or edema, revealed a quantitative relation between sodium and water excretion or retention, respectively. However, the conclusion that the chloride ion is unimportant in edema in comparison with the sodium ion is not justified. It is much easier, other things being equal, to produce edema with sodium chloride than with the equivalent amount of sodium bicarbonate. This follows from the normal composition of body fluids, in which there is about four times as much chloride ion as bicarbonate ion. The antiedemic effect of other chlorides than sodium chloride is undoubtedly due as much to the inability of the body to retain sodium without chloride as to the inability to retain chloride without sodium. Therefore, both sodium and chloride should be restricted in the treatment of edema.

Commercial substitutes for salt usually contain sodium and calcium compounds of formic, malic or amino acids. These are partly excreted unchanged but largely converted into bicarbonates. Since sodium bicarbonate is less edema producing than sodium chloride, the moderate use of these salt substitutes may not harm the patient in spite of the theoretical objection to sodium intake.

Any salt-free condiment or flavoring agent may be allowed to an edematous individual. Pepper, vinegar, lemon juice, onion, paprika and cinnamon can be suggested. D-glutamic acid, which is converted to urea in the body, has been recommended in doses of from 5 to 10 Gm. a day. The sodium salt contains only one third as much sodium as sodium chloride, per gram, and is seven times as salty. This salt has been used extensively in Chinese cooking. Both d-glutamic acid and its sodium salt are available commercially in pure form.

According to information received from the Winthrop Chemical Company by the Council on Pharmacy and Chemistry, Curtasal is composed of sodium formate 98 per cent, magnesium citrate 1 per cent and calcium formate 1 per cent. This preparation has not been submitted to the Council or examined by the Chemical Laboratory.

References:

- Salt Substitutes in the Diet, *THE JOURNAL*, Aug. 6, 1932, p. 497.
Hosal and Bromosal Not Acceptable for N. N. R., *THE JOURNAL*, July 22, 1933, p. 280.
Eka Salt Not Acceptable for N. N. R., Annual Reprint of the Reports of the Council on Pharmacy and Chemistry for 1934, pages 46, 47 and 48.

ANTIGEN-ANTIBODY REACTIONS—DENATURED PROTEINS

To the Editor:—1. Has any successful concentration of antibodies been obtained by attempted separation of antibody from antigen? 2. Can a denatured protein be restored to its native state? I have a recollection that Anson and Mirsky made some attempts along this line.

ALBERT ZRONEK, M.D., Chicago.

ANSWER.—1. This question can be considered from two points of view: first, whether the reaction between antigen and antibody is a chemically reversible reaction in the sense that in a mixture of the two substances an equilibrium is attained in which the speed of combination is equal to the speed of dissociation, and, second, whether the isolated product of the reaction of antibody and antigen, in the form of either sensitized bacteria or cells, or precipitate from precipitin reaction, can be separated by manipulation into its component parts.

Reversibility in antigen-antibody reactions has been the subject of much experimentation and is discussed in such publications as "Infection and Resistance" by Hans Zinsser and "The Chemistry of Antigens and Antibodies" by Marrack. Madsen, Arrhenius and Ehrlich proposed that the basic laws of chemical equilibrium and mass action applicable to the reaction of acids and bases can find their analogies in serologic reactions. On the other hand there are facts that are inconsistent with these theories, such as the Danyz phenomenon, in which there is a

different result when the same quantity of antigen is mixed with a given quantity of antibody and when it is mixed in divided amounts, and the observation that the precipitate from precipitin reactions does not always dissolve in excess of antigen as would be expected in true equilibria. The fact does remain, however, that the combination of antigen and antibody is in some instances clearly reversible, as shown by the following experiment: If an amount of red cells is saturated with hemolytic amboceptor, washed free of excess of this reagent and then mixed with an amount of untraced red cells, all the red cells, both the original and the newly added ones, can be shown to be sensitized by the hemolysis following the addition of complement. The only explanation of this phenomenon is that red cells may combine with more amboceptor than is necessary for hemolysis but will give up the excess amboceptor in the presence of unsensitized red cells.

The combination of antigen and antibody may be destroyed by various manipulations. The efficacy of neutral mixtures of diphtheria toxin and antitoxin as immunizing agents indicates that in the body the toxin is slowly released from its combination with antitoxin. The readiness with which this combination can be broken up is illustrated also by the incident which occurred a few years ago when a commercial product of diphtheria toxin-antitoxin became highly toxic after it had been frozen. The precipitate from precipitin reactions and cells and bacteria sensitized with their corresponding immune serums can be treated with various reagents so as to release the bound antibody. Hypertonic or relatively strong alkaline solutions are usually employed and use is made of the method to obtain highly purified antibody solutions. Heideberger and Kendall (*J. Exper. Med.* 64:161 [Aug.] 1936) in this way obtained from the precipitate formed with pneumococcus polysaccharide and antipneumococcus serum a solution of antibody in which 93 per cent of the nitrogen belonged to the immune bodies.

2. Denaturation of proteins, in contradistinction to precipitation, carries with it the idea of permanence. The actual chemical changes that occur in the process of denaturation are consistent with this idea. While there are some writers who say that denaturation is a reversible process, they base their assertion solely on the fact that some, but by no means all, denatured proteins can be redissolved. But there have been few attempts to show that the properties of the redissolved protein are identical with the native protein. The best evidence on this point is obtained by immunologic means. Theoretically, denatured proteins should be antigenic because they are digestible, since digestibility and antigenicity are closely parallel. However, the insolubility of denatured proteins interferes with their antigenic properties. When resolution of denatured proteins can be accomplished without secondary alterations due to the solvent, or when denaturation can be produced without coagulation, the proteins can be used as antigens. In such instances the immune reactions have shown that in most cases denaturation results in marked changes in specificity and this, in turn, denotes changes in the chemical structure of the proteins. From this evidence it is probable that recovery of native properties of proteins after denaturation does not occur.

CEREBRAL TRAUMA AND DUODENAL ULCER

To the Editor:—I understand that a gastric or duodenal ulcer can be a sequel to a severe head injury. Please enlighten me on this subject and give references.

M.D., Manitoba.

ANSWER.—The relation between intracranial lesions and gastrointestinal ulcerative processes, according to Cushing's review of the subject (Peptic Ulcer and the Interbrain, *Surg., Gynec. & Obst.* 55:1 [July] 1932), was first suggested by Carl Rokitsky as early as 1841. Within the last decade there have been several reports of brain tumors, operations and accidents with gastrointestinal ulcerative processes, and experimental evidence of this possible relationship has been produced.

Cushing reported three cases of acute perforating gastrointestinal lesions which followed operations for cerebellar tumors. He also cited two cases of gastric erosions following operations for brain tumor, two cases of gastric ulcer associated with malignant hypertension with choked disks, the case of a child of 10 with chronic cicatrizing duodenal ulcer associated with a recurring cerebellar tumor, and the case of a man with duodenal ulcer who had a recurrence of gastric distress associated with each of three exacerbations of intracranial symptoms from a radiosensitive tumor encroaching on the third ventricle.

Vanzant and Brown (*Am. J. Digest. Dis.* 5:113 [April] 1938) described the case of a well nourished, healthy boy of 11 who was hit by a truck, taken to the hospital, treated for concussion for four days, and returned to school in another ten days. Twenty days after the accident his appetite failed and on eating

he noticed pain in the epigastrium. Six weeks after the injury a diagnosis was made of contusion and laceration without localizing signs. There was a spinal fluid pressure of 180 mm. of water, and blood in the stools. Fluoroscopic examination showed a small, irritable, constantly deformed duodenal bulb. A diagnosis of duodenal ulcer was made and the symptoms disappeared on ulcer management.

Additional references:

Masten, M. G., and Bunts, R. C.: Neurogenic Erosions and Perforations of the Stomach and Esophagus in Cerebral Lesions, *Arch. Int. Med.* 54:916 (Dec.) 1934.

Oppen, Lincoln, and Zimmerman, H. M.: Ulcers of the Digestive Tract in Association with Cerebral Lesions, *Yale J. Biol. & Med.* 11:49 (Oct.) 1938.

SPASTIC QUADRIPLEGIA—TOXIC NEURITIS

To the Editor:—1. A white woman aged 50, seen two weeks ago, first noticed difficulty in talking about one year previously. This has gradually increased until now her speech is indistinct. Then she noticed a stiffness of her arms and later of her legs. The paralysis of the legs has progressed so that now she cannot walk and can only with great difficulty move the arms or legs at all. Mentally she seems alert and active but cannot use the muscles of speech to express herself. The blood pressure is 134 systolic, 90 diastolic; the pulse rate is 96. Physical examination shows spastic quadriplegia. She sits with her arms flexed and hands closed. As she sits, her legs tend to straighten out stiffly. The feet are inverted by muscular pull. The extremities show lead pipe rigidity, with greater resistance to flexion than to extension. The left side is more involved than the right. The Babinski reflex is present on the left side; no tremor is present; the fingers can be straightened passively but resist straightening. The Wassermann reaction is negative. The pupils are equal and react well to light. What is the most probable diagnosis? Could a brain tumor cause this? What line of treatment would be advisable? 2. A man about 50 years old has recently returned from Florida. While there he worked removing "bootjacks" from the trunks of some palmetto trees. Shortly after he developed a tingling and pain in both hands and arms. Following this he developed muscular weakness of both forearms and hands. The patient feels sure that this resulted from a poison in the nutmeg under the bootjacks. Have cases of a toxic neuritis ever been reported caused by this? He worked a total of only fifteen or twenty hours. What is the probable duration of this condition and the best line of therapy?

M.D., Washington.

ANSWER.—1. The gradually increasing spastic quadriplegia in a patient 50 years of age without signs of arterial disease, over a period of two years, is suggestive of one of the degenerative diseases of the nervous system. The diagnosis is probably paralysis agitans without tremor. This would account for the speech defect as well as for the spastic paralysis of all four extremities. It would not, however, quite satisfy the finding of "lead pipe" rigidity or the presence of the Babinski reflex on the left side. The rigidity of paralysis agitans is not of the lead pipe type but gives rise, when passive motion is used, to the cog-wheel type of stiffness. The so-called lead pipe type is ordinarily confined to diseases of the pyramidal tract, paralysis agitans being one in which the extrapyramidal tracts are involved, including the motor cells in the basal ganglia of the brain and possibly elsewhere. The Babinski sign, moreover, is indicative of pyramidal tract disease and would not be found in the ordinary case of paralysis agitans. If these two signs are substantiated by repeated examination, another cause for the patient's symptoms should be sought.

The slow onset and progressive character of the disease are, against thrombosis or hemorrhage as the etiologic agent, although either of these, if present in the upper cervical spinal cord or lower end of the medulla oblongata, might give rise to symptoms such as the patient presents. Tumor in this region should also be considered. The fact that there is no disturbance of sensation, however, militates against this diagnosis. In spite of the patient's age there is no reason to forego the amount of information obtainable from examination of the spinal fluid. Pressure studies and estimation of the protein content of the fluid might lead to a more positive diagnosis. If there is a hydrodynamic block in the spinal fluid, or if the protein is markedly elevated, tumor is likely and competent neurologic or neurosurgical advice should be sought.

2. So far as can be ascertained, there is no poisonous substance in the "bootjacks" from palmetto trees or in the nutmeg which lies under them. Toxic neuritis, therefore, from these substances has not been reported. It is more likely that the patient suffers from one of the more ordinary types of infectious neuritis and that he should be treated along the usual lines for this disease. Such treatment consists in massage and galvanism to the muscles affected, if these muscles do not respond to the faradic current, and prevention of overstretching, by the use of splints, if necessary. If there are obvious foci of infection elsewhere in the body, these should be removed. Antineuritic vitamin B might be added to the diet if the neuritis is at all extensive.

HYPOSPADIAS IN ADULT

To the Editor—Please give me information on operations for hypospadias in adults. A man aged 30 has had some childhood diseases, an attack of influenza in 1919 and two attacks of gonorrhea. His physical examination is essentially negative except for a slight secondary anemia (color index 0.9) and a penile hypospadias. The urinary meatus is approximately $1\frac{1}{2}$ inches back from the end of the penis. There is a definite chordee and a rudimentary urethral groove with a rudimentary corpus cavernosum reaching nearly to the end of the penis. There is a large dorsal prepuce in the shape of an apron. My plan of operation is to straighten out the penis by a transverse ventral incision with subsequent severing of the rudimentary corpus cavernosum and suturing in the opposite direction. In the second step for building up the urethra proper I want to use the Ombredanne method, utilizing the prepuce. I wish to know your opinion as to this plan and I would like to know further whether the use of a permanent catheter during the first or second stage of the operation, or during both stages, is indicated. Is it advisable to destroy the hair follicles in case some hair-bearing part of skin is used for building up the new urethra? There are plenty of references to be found as to the correction of this malformation in early childhood, but so far I have been unable to find anything dealing with the situation in adults.

M D, California.

ANSWER—Whether or not a man who is 30 years of age should have an operation for the correction of hypospadias may be open to debate. This depends on whether the patient is married; if he is, and can perform his marital duties, it might be well at 30 to "let well enough alone." On the other hand, if the patient is not married and wishes his defect corrected before he gets married, one might discuss the question of an operation for the hypospadias.

If the presence of the chordee prevents the patient from having satisfactory intercourse, one is justified in advising him to have the curvature straightened. As suggested, this may be done by making a transverse ventral incision. On the other hand, a good many men are now using the tube graft instead of the procedure suggested in the query. If the patient is married and his wife has borne children, it may be possible that correcting the deformity alone is all that may be needed. But if it is a question of sterility and if the external urethral orifice is far back, the urethra of course would have to be advanced in order to deposit the semen in the vagina. Then again, if the opening is only an inch or so behind the tip of the glans penis it might be well to leave it alone.

The objection to the use of the Ombredanne method is the fact that hair may be present and stone formation may occur; therefore many men believe in the advisability of destroying the hair follicles.

Various types of operations are discussed and illustrated in textbooks on urology.

PERFORATION AND BLEEDING IN PEPTIC ULCER

To the Editor—I would appreciate it if you would give me some information regarding an accident case under my care. 1 I should like to know the percentage of occurrence of perforation in ulcer ventriculi et duodeni according to the latest statistics. 2 What is the percentage of occurrence of bleeding in cases of ulcer of the stomach and duodenum? 3 What is the percentage of occurrence of the two in the same ulcer patient? 4 From what literature could I learn most about occurrence of bleeding in ulcer cases after trauma (heavy lifting and strenuous work)?

M D, Massachusetts

ANSWER—A critical review of the recent literature on the incidence of perforation and bleeding in chronic gastric and duodenal ulcer reveals a variable array of statistics. This is particularly true with reference to bleeding. Statistics based on the cases admitted to the large metropolitan charity hospital or outpatient clinic differ materially from those published by the private hospital or private practitioner. There also is marked variation in the immediate mortality from bleeding ulcer following medical or surgical treatment. The incidence of acute and chronic perforation and hemorrhage is also influenced by the element of time; that is, the duration of the disease when the patient first came under observation and the duration of the period of observation thereafter. Therefore the data submitted are approximate, strictly speaking, rather than exact.

1. Acute perforation occurs in 5 per cent of ulcers of the stomach and duodenum. Statistics embracing a large series of surgically verified cases reveal that subacute (forme fruste) and chronic perforation occurs in from 25 to 28 per cent of both gastric and duodenal ulcers. The large majority of these (over 90 per cent) are of the chronic variety.

2. The percentage of occurrence of bleeding in both gastric and duodenal ulcer is 30.

3. The occurrence of both acute perforation and hemorrhage is infrequent. Available statistics are too meager on which to base any definite conclusions. Goldman (*Ann. Surg.* 40: 541 [June] 1938) reported seven cases of this nature repre-

senting 2 per cent of the entire series reported. The impression that bleeding ulcers do not perforate and perforating ulcers do not bleed is justifiable to a considerable extent. However, as high as 8 per cent of duodenal ulcers which had given rise to hemorrhage of variable extent showed evidence of chronic perforation at operation.

4. The following textbooks and articles may be consulted:

Brahdy, Leopold, and Kahn, Samuel. Trauma and Disease, Philadelphia, Lea & Febiger, 1937, p 181.

Lusterman, G. B., and Balfour, D. C. The Stomach and Duodenum, Philadelphia and London, W. B. Saunders Company, 1936, p 756.

Crohn, B. B. Affections of the Stomach, Philadelphia, W. B. Saunders Company, 1927, p 621.

Beams, A. J. Industrial Aspects, *Ohio State M. J.* 32: 130 (Feb) 1936.

Alvarez, W. C. Severe Gastric Hemorrhage Produced by Violent Abdominal Massage, *THE JOURNAL*, July 11, 1936, p 129.

On the basis of repeated observation by competent authorities with large experience, the evidence seems indisputable that unusual physical or mental exertion as well as alcoholic debauches and external trauma can provoke gross hemorrhage in a patient harboring an acute or chronic peptic ulcer.

POSTOPERATIVE DEATH FROM ANURIA

To the Editor—In a case of anuria following an operation for gangrenous appendicitis, death resulted forty-three hours after operation without indications of peritonitis, and with the patient in what seemed to be a good condition when he left the operating room. The patient, aged 37, weighed 175 pounds (79 Kg.), was the father of three healthy children and enjoyed good health until the operation except for two previous spells of abdominal pain that were suggestive of appendicitis, the first in 1936 and the second in July 1938. He was seen forty-eight hours after the first symptoms, November 9. Operation began at 7 05 p. m. and terminated at 8 50. A much thickened gangrenous appendix was removed and rubber drains were inserted down to the stump. He left the operating room with a pulse rate of 100, respirations 30, blood pressure 164 systolic, 64 diastolic. Before operation he had a red blood cell count of 5,180,000 with hemoglobin 100 per cent, white cell count 13,800, polymorphonuclears 86 per cent and with a urine specific gravity of 1.020 and negative for albumin, sugar, acetone, indican, red or white cells, casts, crystals or amorphous sediment. The Wassermann reaction was negative. After operation his condition seemed good. He had a morphine injection of one fourth grain (0.16 Gm.) at midnight and 4 a. m., with 2,000 cc. of 10 per cent dextrose in saline solution given during the night. He voided 10 ounces (300 cc.) of urine at 6 a. m., at which time the pulse was 98, respirations 22 and temperature 101. During the day of November 10 hypodermoclysis of 3,000 cc. of 10 per cent dextrose solution was given. The abdomen remained soft but the temperature went up to 103 F. and no urine was voided until death occurred at 3 a. m. November 11. The catheter was passed three times during this period but no urine was found in the bladder. The patient died in coma. Stimulants, oxygen and general symptomatic treatment were given. Did this anuria result from operative shock, the anesthetic (nitrous oxide and ether), by reflex action on a normal kidney or were we dealing with a previously damaged kidney that was functioning well? Was forty-three hours sufficient time for a fatal uremia in a previously normal person?

C. E. JUMPER, M D, El Paso, Texas.

ANSWER—In this case there was probably a previously damaged kidney. The damage had not been sufficient, however, to cause symptoms or produce albumin in the urine. Non-protein nitrogen and urea estimation before the operation would have been of value and interest but certainly was not indicated in the emergency that existed. It would seem unlikely that nitrous oxide and ether or operative shock could have been an important factor in this case. An intravenous injection of 50 per cent dextrose solution might have been of some value, although it is doubtful.

CRYSTALLIZED BLOOD FOR DIAGNOSIS

To the Editor—I am writing with regard to the article published in *Life* magazine January 2 on "Diseases Diagnosed by Crystallized Blood." I am much interested in this article and should like to know where I can obtain more detailed information concerning the subject.

PAUL G. WEISMAN, M D, Colfax, Wash.

ANSWER—The article in question was probably based on a report by Dr. P. Bégouin of Bordeaux at the June 28, 1938, meeting of the Académie de médecine de Paris. According to this report, blood for the test is obtained by needle puncture of the fingers and is received in distilled water to which a solution of chloride of copper is added. Crystallization takes place in the specimen in eighteen hours. The results were as follows: In cancer a correct diagnosis was made in thirty of seventy-nine cases of various types and in tuberculosis a correct diagnosis in eight of nine cases; in one patient who had syphilis and a cancer of the tongue, the former was diagnosed but not the latter; crystallization permitted a differential diagnosis to be made between a cancer of the epithelial type and other tumors such as sarcoma and those of a mixed cell type. It has been maintained by Pfeiffer, a Swiss chemist, who is the originator

of the test, that this method is also helpful in determination of the correct drug to be employed. It seems to be agreed that long training is required before one can attempt this method. The only one who has apparently tried the method so far is the French surgeon Dr. Bégouin and so far as can be determined he has not made any further observations since early in 1938. It is at least obvious from the foregoing that this method is highly experimental, that it will require much independent confirmatory evidence before it can be accepted and that it should under no circumstances replace the more established and definitely known reliable methods of diagnosis and treatment already available. This is another example of premature (to say the least) publicity in a nonmedical publication.

GOLD INJECTIONS AND COLITIS

To the Editor:—A young woman has been having gold injections for lupus erythematosus. During the process of treatment some tenesmus with frequency of bowel movements developed. At this time a maculopapular rash was noted on the chest and abdomen. The diarrhea insidiously progressed within the next two weeks into a fulminant colitis. Rectal discharges became frequent, bloody and purulent. On repeated cultures of the stools the predominant organism was identified as the diplostreptococcus described by Bargen. The heavy metals are notably eliminated in the intestinal tract. In overdoses (or susceptibility?) thrombosis of the small blood vessels of the intestinal mucosa occurs. Bargen has described the histologic appearance of ulcerative colitis as essentially a process of minute and discrete ulceration attendant on septic infarction of the blood vessels of the mucosa and submucosa of the colon. Whether Bargen is right in his contention that this organism is the causative agent of ulcerative colitis or whether, as Paulson has pointed out, this is one of a group of cocci whose normal habitat is in the ileum and which have been washed down into the colon is beside the point in this instance. Is it plausible to feel in this case that the resistance of the intestinal wall may have been lowered as a result of damage to the endothelium of the blood vessels in the excretion of the injected gold so that usually innocuous bacterial inhabitants have become facultative pathogens? Or is it safe to dismiss the sequence of heavy metal administration and diarrhea as purely coincidental and unrelated?

M.D., Connecticut.

ANSWER.—No references have been found in the literature to reactions from gold injections in which there was a complicating involvement of the mucous membrane of the colon. The patient did have a maculopapular eruption, however, over the chest and abdomen, and it would certainly be wise to discontinue further gold injections. It might be well to use bismuth injections instead. Before instituting that form of treatment, however, the blood should be examined carefully. With all of the heavy metals, it is well known that occasionally aplastic anemia and even agranulocytosis occurs. Is there a possibility of such a contingency in this case? If there is, one could understand the reaction in the colon, as there is no reason why such a reaction could not occur there just as well as in the pharyngeal space, for example.

HORSE DANDER AND HORSEHAIR IN ALLERGY

To the Editor:—I should like to call your attention to an apparent discrepancy between an answer under the subject "Asthma" in *THE JOURNAL* Nov. 12, 1938, and that under the subject "Allergy to Horsehair" in *THE JOURNAL* March 12, 1938. In the later answer it is stated that "even patients sensitive to horse dander are not sensitive to horsehair after its preparation for use in furniture." The answer on March 12 says that "therefore horsehair mattresses can cause symptoms in all but the least sensitive individuals." Does this difference exist between those who have asthma and those who have a vasomotor rhinitis or do the two answers represent individual opinions?

GORDON B. SMITH, M.D., Rutland, Vt.

ANSWER.—The inquiry resolves itself into a question of whether an individual who is sensitive to horse dander usually has a sensitivity to horsehair as found in mattresses and furniture or whether such an individual is never sensitive to horsehair. Several years ago, with the idea of attempting to solve this question, some experiments were made on horse dander sensitive individuals. Varying dilutions of extracts of horse dander, unwashed horsehair and horsehair after it had been prepared for use in mattresses were injected and the reactions noted. In one such instance the horse dander reacted with a dilution of 1:10,000,000 or higher. The unwashed hair gave its first reaction in 1:10,000 dilution and the washed hair in 1:100. In another highly sensitive individual the 1:10,000,000 gave a 3+ reaction, while the first doubtful reaction with the unwashed hair was with 1:1,000 and the extract of washed hair did not react in the strength of 1:50. This would indicate that by far the greatest amount of antigen is removed by the process of cleaning, washing and boiling. The washed hair contains less than $\frac{1}{10,000}$ th part of the antigen. However, the fact remains that some horse dander antigen can be demonstrated and it is

possible that some horse dander sensitive individuals will have trouble from horsehair as it is found in mattresses.

The practical application of these facts is that a large source of exposure such as a hair mattress should not be inflicted on a horse dander sensitive person, whether he has asthma or vasomotor rhinitis. It is questionable, however, whether a small amount of horsehair such as is found in the seats of chairs or in the padding of coats would be of any particular importance.

THERAPY OF STILL'S DISEASE

To the Editor:—A girl aged 9 years has been suffering from Still's disease for the last three or four years. She has had her tonsils and bad teeth out without any improvement and has been receiving a vaccine—I think Crowe's vaccine—at the hands of another physician. This little girl is becoming deformed and progressively worse. Is there anything which has been found useful in checking the progress of this disease?

M.D., Ontario.

ANSWER.—The following might be suggested as regards treatment:

1. A high caloric, high vitamin diet.
2. Bed rest.
3. Cevitamic acid, 25 mg. a day.
4. Crystalline vitamin B₁₂, 1 mg. a day.
5. Ten thousand units of vitamin D, each day.

Every effort should be made to prevent further deformities and to correct those already present. This can be accomplished only by means of physical therapy, exercises, and whatever conservative orthopedic measures such as the application of casts and the like are necessary.

Still's disease is at times unrelenting in its progress, despite all forms of therapy. This, however, is the exception rather than the rule. Occasionally one sees striking results from repeated small transfusions. A good conservative, supportive regimen aimed at maintaining as much joint motion as possible, plus the prevention and correction of deformities, should be carried out indefinitely and should never be abandoned even when any of the so-called specific measures are being employed.

TRAUMA AND THROMBOSIS

To the Editor:—A man aged 52 sustained a fracture of the right ascending ramus of the pelvis on Aug. 20, 1938. October 12 he was taken with distress in his chest and shortness of breath without actual pain. October 15 he began to cough, had a fever and developed a bronchial pneumonia. He recovered from the pneumonia after three weeks and on November 9 was taken with a pain in his right leg and the leg became swollen and somewhat discolored. He had a slight fever for ten days. A diagnosis of phlebitis was made. The heart shows some myocardial damage. It was impossible to tell whether the myocardial damage was of recent origin or of old standing. I should like to know how long after an injury it is possible to get a thrombus from the injury. Also can you mention some authorities or literature on this subject. In this case it was nearly three months from the time of the injury to the phlebitis. Could the pneumonia have been due to an infarct? Any information you can give on these subjects will be appreciated.

M.D., New York.

ANSWER.—A pelvic thrombosis following fracture of the pelvis is not infrequent; it may occur a few days after the injury but remain a short "silent" clot in the hypogastric vein without clinical manifestations. Such clots are more apt to give rise to pulmonary emboli than those in the external iliac or femoral veins. Later such clots in the pelvis may extend to the common or external iliac veins and give rise to a typical deep thrombophlebitis.

It is not stated in the query whether or not the patient was steadily immobilized from the time of the injury to the time of the symptoms in the chest; it is possible that this was an infarct, followed by consolidation, but the data supplied do not permit any opinion as to the cause of the bronchopneumonia. Sudden dyspnea with some cyanosis, lobar involvement followed by pleuritic rub, rusty sputum, and the x-ray finding of a triangular infarct with increased hilus shadows on the side of involvement are suggestive of a pulmonary embolus.

The time interval between trauma and thrombosis varies from a few days to several months. If the patient is immobilized as a result of the injury, small initial clots may grow by apposition until some mechanical, physiochemical or climatic stress suddenly makes the process manifest. The longest recorded interval between injury and embolism is the case of Strauss: a man aged 49 died of pulmonary embolism three months after fracturing his patella; eighteen days before death, however, a light embolic shower occurred.

References:

- Brahdry, Leopold, and Kahn, Samuel: *Trauma and Disease*, Philadelphia and London, Lea & Febiger, 1937.
Vance, B. M.: *Thrombosis of the Veins of the Extremities and Pulmonary Embolism as a Complication of Trauma*, *Am. J. Surg.* 26: 19 (Oct.) 1934.

DILATION OF CERVIX AND STERILITY

To the Editor:—I have a patient who is anxious to have a baby. She is 30 years old and has been married six years. The family history, menstrual history and physical examination are essentially negative except for a mild case of malarial fever and pyelitis several years ago. A specialist who saw her stated that the mouth of the cervix was too small or closed and that if she had this dilated she would probably become pregnant. Since the menstrual history is essentially negative, I could not understand the rationale of this treatment. Will you please explain? It seems to me that the thing to do in this case would be to make a thorough study of the endocrine system and examine a specimen of semen from the male.

M.D., South Carolina.

ANSWER.—In a case in which menstrual blood can pass downward through the cervical canal there is obviously no anatomic barrier to the upward passage of spermatozoa. Two conditions not infrequently associated with stenosis of the external os require consideration when the complaint is sterility. Of these the first is retention and inspissation of the endocervical mucus, which may form a plug viscous enough to entangle the male cells. The second is female genital hypoplasia, of which a long, conical and anteflexed cervix with a pin-hole os is a familiar stigma. For the latter disorder dilation would be entirely useless. The presence or absence of the first abnormality can be determined precisely by direct observation of the endocervical secretions and by postcoital examination. If it is found to be present, repeated gentle dilations may produce some benefit; but more permanent results are obtained by a small posterior median discission. Otherwise dilation, though a time-honored procedure, has no value. The endocrine balance of the wife should certainly be investigated. It is of primary importance in all cases of sterility to evaluate the husband's semen according to the most critical mathematical standards before subjecting the wife to any elaborate treatment.

AZOOSPERMIA AFTER MUMPS ORCHITIS

To the Editor:—A man of 38 has azoospermia. At the age of 18 years he had bilateral mumps orchitis. It is not known whether he had spermatozoa before that or not. The testes now are about 40 per cent of usual size and apparently of normal consistency. He has developed normally otherwise. The growth of hair on the face is not heavy and there is not much hair on the body. The voice is normal. Sexual desire and ability are quite normal. The blood pressure is 95-100 systolic, 60 diastolic. The pulse at rest is 60, the temperature a little subnormal, the basal metabolism minus 10 per cent. The red cell count is normal, the white count low normal with mild eosinophilia at times. The patient is quite intelligent. He states that he tires easily on mental exertion and has difficulty in concentration. He is inclined to yawn more than normal. His general physical condition is fairly good and he stands physical exertion quite well. Do you believe that the use of anterior pituitary-like substance or testosterone or both would be of value? Have you any other suggestions as to treatment?

M.D., New York.

ANSWER.—At the present time it is not likely that spermatogenesis could be produced in this patient by the administration of the anterior pituitary-like principle from the urine of pregnant women or testosterone. Further observations of the basal metabolic rate should be made, because the level of metabolism is of much more importance than a single test. If the level should prove to be below minus 15 per cent, it should be raised to normal with desiccated thyroid.

SULFANILAMIDE FOR GONORRHEA: DOSAGE IN CHILDREN

To the Editor:—What is the dosage and what are the contraindications for sulfanilamide (oral and parenteral) in the adult in acute and chronic gonorrheal urethritis? Could this drug be given safely to infants and children? If so, in what dosage? What tests should be done in order to find out the tolerance of an office patient to sulfanilamide?

M.D., California.

ANSWER.—The systems of dosage employed by various urologists when sulfanilamide is used in the treatment of gonococcal infections vary somewhat. Probably the most commonly used system for ambulant patients consists of giving from 4 to 5 Gm. of sulfanilamide for two days, from 3 to 4 Gm. a day for five days and then from 2 to 2.5 Gm. a day for a week; this to be followed by 1.3 Gm. a day for two weeks, making the total course of treatment about one month.

The only real contraindication to the use of sulfanilamide is that the patient has previously been given the drug and has had a toxic reaction to the drug. To such a patient a test dose of 0.3 Gm. should be given and the patient kept under observation for possible immediate toxic reaction.

Sulfanilamide may be given with as much safety to infants and children as to adults. Because of a greater fluid intake, children require slightly larger doses of sulfanilamide than do

adults. In children severely ill with an infection which may be treated with sulfanilamide the total dose the first day is based on 0.15 Gm. of the drug per pound of body weight. This is divided into six parts and is given at intervals of four hours. In children less severely ill the daily dose is based on 0.07 Gm. per pound of body weight and likewise split into six parts and given at four hour intervals.

Sodium bicarbonate may generally be administered concurrently with sulfanilamide. There is no test for susceptibility to the drug except the administration of a small test dose by mouth.

ASTHMA FROM CONJUGAL ASSOCIATION

To the Editor:—A man aged 32, a miller in a feed mill, has asthmatic attacks. These attacks come on only at night and when his wife is in the house. Previous to meeting his wife before marriage nine years ago the patient never had an attack. He has had complete physical examinations, negative Wassermann tests and forty-two negative pollen and food diagnostic tests. It appears that when his wife is away from home any length of time the attacks cease, but when she returns the attacks return. Being near other women does not bring on any attacks. The patient's wife has tried eliminating all forms of cosmetics and certain types of clothing for several months at a time, with no particular effects. She does not use waxes in her hair or any other form of preparations, such as dye. The patient's occupation does not seem to have any bearing on his case, because, as stated, he does not have any when his wife is away. His attacks are of the severe asthmatic type, which require epinephrine for relief, and this he must take nightly if his wife is at home. For a few years it has been impossible for them to sleep in the same bed at night. It has been suggested that the wife's hair might be the offending cause. Is this likely? A pharmaceutical house wants a pound of hair in order to make a vaccine for treatment. What would be the best procedure to determine the exciting cause of the attacks?

M.D., Pennsylvania.

ANSWER.—The evidence given would certainly seem to incriminate something associated with the wife. Assuming that this information is correct and that no factors other than the wife's surroundings play a part, the obvious thing is to have the wife avoid completely those materials which might possibly bring on asthma in her husband.

First of all, she should use nothing but hypo-allergenic cosmetics. She should especially avoid perfumes during the day as well as during the night. It would also be wise for both husband and wife to use plain soap instead of perfumed soap. By this method one should be able to rule out sensitivity to orris root. Incidentally, the patient himself should use no talcum powder or after-shave lotion except one made by those concerns making nonallergic preparations. It is also possible that the patient is sensitive to silk, and it would be well for the wife to substitute for silk nightgowns either cotton or linen.

Another possibility is that the husband might be sensitive to some contraceptive used by the wife such as a solution or a jelly of some sort. The use of such a preparation should be stopped for a trial. Of paramount importance is the necessity of complete testing of the skin. The query states that only forty-two pollen and food tests were carried out. This is by no means complete, as there are several hundred tests including such substances as feathers, animal danders, silk, kapok, furs, molds and yeasts, and house dust.

Lastly, the patient's occupation might lead to asthmatic attacks. However, it is hard to believe this important, as the attacks come on only at night and only when the wife is in the house.

CONGENITAL AMBLYOPIA

To the Editor:—Please give me some information on congenital amblyopia. What is the consensus as to classification as a functional or organic condition?

M.D., South Dakota.

ANSWER.—Ophthalmologic opinion is still greatly divided as to whether congenital amblyopia is a functional affair or whether it is due to some anatomic failure of development. Thus far no eye with clinically proved congenital amblyopia has ever received microscopic examination, but there seems to be clinical evidence that some cases are organic while others are purely functional. In the higher degrees of congenital amblyopia in which the vision is somewhere between 1/200 and 10/200, central visual acuity can never be developed to a higher degree, indicating an organic malformation as yet undetected. In the second type of case the central vision will vary between 2/200 and 0.2 and it can be improved considerably by continuous occlusion of the fellow eye. In the third type of case the vision will be between 0.2 and 0.6 and it can always be brought up to practically normal if the developmental work is started early enough in life. The latter two types would seem to be more functional than organic.

HEREDITY OF HEMOLYTIC JAUNDICE

To the Editor:—I should appreciate some information on the hereditary factor in hemolytic jaundice. A woman of 19 had her spleen removed with this diagnosis eight years ago. Her mother and two maternal aunts had splenectomies with the same diagnosis. She knows of no other cases in her family history on either side. She now comes asking the question "If I had children is it probable that some of them would have this disease?"

M.D., Massachusetts.

ANSWER.—Hemolytic jaundice seems to be inherited as a "dominant" mendelian character (Campbell, J. M. H., and Warner, E. C.: *Quart. J. Med.* 19:333 [April] 1926). A dominant mendelian character is inherited directly from parent to child. Of the children half, on the average, will have the character and half will not. The former will again behave like their parents; the latter, provided they marry a normal person, which is almost certain to be the case with such a rare condition, will have normal children. Males and females are affected equally and are equally able to transmit the defect.

Occasionally jaundice is present from birth in a patient whose family history is negative. Such a case probably represents a curious mutation from the ordinary constitution of the family, but the disease will be transmitted as a dominant mendelian character as described (*Cyclopedia of Medicine* 7: 593, 1934). The abnormal fragility of the red cells found in hemolytic jaundice may occur in latent cases without the other signs and symptoms of hemolytic jaundice, and it may persist after splenectomy.

LATE ANEMIA NOT RELATED TO SULFANILAMIDE

To the Editor:—In August 1938 I gave a 16 year old boy, living 15 miles out of town, at least 125 grains (8 Gm.) and no more than 150 grains (10 Gm.) of sulfanilamide over a period of four or five days for sore throat. Since he is the son of a telephone operator I heard from him frequently; he became quite cyanotic according to his mother's report and on the second or third night woke up with a "spell" lasting less than an hour, which I thought was a "nightmare" as a result of the gastric irritation. At intervals of two or three days for three or four weeks I had reports that the boy was normal. About the twenty-fifth of this month the boy seemed below par, and his mother took him to a local physician, who found a slight anemia (4 million plus); this physician is wondering whether the anemia might be the result of the action of the sulfanilamide given six months ago. The boy has seemed normal since, and I wish to know whether anemia often if ever lasts six months except following violent reactions.

J. D. MICHIE, M.D., Childress, Texas.

ANSWER.—There is little reason to suspect that an anemia noted six months after a course of sulfanilamide is the result of the patient having taken the drug. The anemias resulting from sulfanilamide therapy are generally acute or subacute hemolytic anemias, which clear up rapidly after the drug is stopped.

X-RAYS AND SCABIES

To the Editor:—How effective are the x-rays in the treatment of scabies? How many units may be used safely, how often repeated, and at what intervals? Do the mercurials, zinc and other metals in ointments or lotions interfere with the use of x-rays? In the case in question the outbreak has been confined to the back of the hand. Various ointments have caused the eruption to abate even to the point of apparent cure, but new outbreaks occur at intervals of two and three weeks. Gloves have been dry cleaned and boiled and bedding also. The history of the case is diagnostic of scabies and the burrows are typical.

M.D., Illinois.

ANSWER.—Given enough x-rays the itch mite and her eggs would be destroyed, but the skin of the patient would also suffer. Scabies requires treatment of the whole skin except that of the head; therefore x-rays are not adapted to its treatment, even though they are known to be effective. Scabies can be eradicated by much simpler means.

Yes, heavy metals and their salts impede the passage of x-rays, depending on the density of the metal, the amount overlying the skin and the character of the rays.

CORNEAL GRAFTING

To the Editor:—Would you outline the indications and contraindications along with the technic of corneal grafting after the methods of Castroviejo and the Russian procedure?

M.D., Pennsylvania.

ANSWER.—The indication for corneal grafting, regardless of the method used, is the presence of an opaque cornea that prohibits the adequate passage of light. The contraindications are somewhat more important and are based on experience. First is a corneal staphyloma, either with or without increased intra-ocular pressure; second, a chronic incurable infection of the tear passages, conjunctiva or cornea; third, calcareous deposits within the cornea; fourth, increased intra-ocular pressure, and fifth, lack of proper light perception. It is fairly well known that the cornea scarred by burns, particularly chemical

burns, does not accept a transplant favorably, whereas a corneal transplantation is almost always successful in cases of old interstitial keratitis. There are various gradations between these two extremes.

Description of the Castroviejo and of the Filatov technic is too lengthy for these columns. Briefly, Castroviejo transplants a rectangle of cornea which has been removed by the twin knives that he designed, while Filatov transplants a round button of cornea which has been removed by a rotary trephine. Both surgeons are varying their technic continuously as experience improves their methods and technicians improve their instruments. Much remains to be done, but the results in the hands of these experts are encouraging.

ARGYRIA AND ANTISYPHILITIC TREATMENT

To the Editor:—A syphilitic woman used a mouth wash of strong solution of silver nitrate (lunar caustic sticks dissolved in warm water) for ulcers on her tongue in April 1938. She now shows a dark blue coloring of the skin of her entire body, which is slowly fading. What antisyphilitic treatment is contraindicated and what would be permissible and why?

D. T. COLE, M.D., Anna, Ill.

ANSWER.—There is no contraindication to antisyphilitic treatment in a case of argyria. The silver in the tissues is inert and difficult to affect by any kind of treatment. The claim has been made that argyria has improved after long continued ingestion of iodides but this has not been substantiated (Yandell, L. P.: Cyanosis from Nitrate of Silver Removed by Iodide of Potassium, *Ann. Practitioner* 5:329, 1872). Yandell's patient was given mercury vapor baths before the iodide was used. This is the only evidence that silver once deposited in the tissues is affected by antisyphilitic treatment. Others have tried it and reported no success.

In the case under discussion the syphilis should be treated without regard for the argyria.

TUBERCULOSIS AND ALUMINUM PAINT

To the Editor:—A man aged 24, working in a factory for the last three years spraying aluminum paint, contracted tuberculosis of the lungs. X-ray examination shows tuberculosis of the lungs and no silicosis. He wishes to collect compensation. How can we prove that his work was the cause of his tuberculosis?

M.D., Massachusetts.

ANSWER.—Proof of occupational origin of tuberculosis is rarely possible except in cases in which opportunities for contact with the tubercle bacillus are unusual; for example, nurses in tuberculosis hospitals. Excessive mortality from tuberculosis in any occupational group constitutes presumptive evidence of environmental factors that may depress natural resistance and permit new or preexisting foci of latent infection to cause active clinical disease. Preemployment examinations to prove the absence of such disease before exposure are essential; periodic examinations during exposure must demonstrate its evolution. Extra-occupational contacts with an "open" carrier must be excluded. Evidence is not available of high tuberculosis rate in aluminum spray painters.

VIABILITY OF TUBERCLE BACILLI ON PIPES—
FORMALDEHYDE STERILIZATION

To the Editor:—I have been asked by a pipe lover who was bequeathed a fine collection of pipes, including both clay and wood bowls, five years ago by a tuberculous patient whether it would now be safe to smoke the pipes and if not whether there is any available procedure which will make the pipes safe and still not damage their smoking qualities or appearance.

M.D., California.

ANSWER.—Under the conditions mentioned there is no evidence to support the belief that tubercle bacilli would remain viable after five years. Experimental evidence has shown that tubercle bacilli die within sixty to ninety days under conditions in which they cannot metabolize. However, in order to make absolutely certain that no infection can be transmitted the pipes can be safely sterilized without damage to them in formaldehyde fumes.

INTRAVENOUS MEDICATION FOR PYELITIS

To the Editor:—What preparation is used for pyelitis intravenously?

J. LOUIS WALDBER, M.D., Loveland, Colo.

ANSWER.—A 40 per cent solution of methenamine in 5 cc. ampules is obtainable for intravenous administration. Protosil (the disodium salt of 4-sulfamido-phenol-2'-azo-7'-acetylaminol-1-hydroxynaphthalene-3',6' disulfonic acid) is given intravenously. A 2.5 per cent solution is put up in ampules of 5 cc. Neosarsphenamine is given intravenously in a dose of 0.2 Gm. for coccic infections.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, April 15, page 1529.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical centers having five or more candidates desiring to take the examination, May 1-2 (Part II only—limited to a few centers), June 19-21, and Sept. 11-13. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th Street, Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. Oral examinations for all candidates, St. Louis, May 13-14. Written. Various places throughout the United States, Sept. 9. Applications must be filed by July 11. Oral, Part II. Philadelphia, Oct. 14-15. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: Philadelphia, Oct. 30-Nov. 1. Sec., Dr. C. Guy Lanc, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: Written. Various sections of the United States, Oct. 16 and Feb. 19. Formal application must be received before Aug. 20 for the Oct. examination and on or before Jan. 1 for the Feb. examination. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: General oral, clinical and pathological examinations for all candidates, Part II examinations (Groups A and B) will be held in St. Louis, May 15-16. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Written. Various cities throughout the country, Aug. 5. Oral. St. Louis, May 15 and Chicago, Oct. 7. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: St. Louis, May. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: St. Louis, May 12-13 and Chicago, Oct. 6-7. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Cincinnati, Nov. 15. Appointments must be made before July 15. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Chicago, May 13. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: St. Louis, May 11-14. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: Part II. New York, May 8 and May 9. Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

AMERICAN BOARD OF UROLOGY: White Sulphur Springs, W. Va., May 26-28. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

New York September Examination

Mr. Herbert J. Hamilton, chief, Bureau of Professional Examinations, reports the written examination held at Albany, Buffalo, New York and Syracuse, Sept. 19-22, 1938. The examination covered nine subjects. An average of 75 per cent was required to pass. Three hundred and fifty-nine candidates were examined, 221 of whom passed and 138 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Arkansas School of Medicine.....	(1938)		1
Georgetown University School of Medicine.....	(1937, 5), (1938, 3)		8
Loyola University School of Medicine.....	(1938, 2)		2
Northwestern University Medical School.....	(1936), (1938)		2
Rush Medical College.....	(1937, 4), (1938)		5
School of Med. of the Division of Biological Sciences.....	(1934)		1
University of Illinois College of Medicine.....	(1933)		1
University of Kansas School of Medicine.....	(1935)		1
University of Louisville School of Medicine.....	(1938)		1
Johns Hopkins University School of Medicine.....	(1936)		1
Boston University School of Medicine.....	(1937)		1
Harvard University Medical School.....	(1937), (1938)		2
Tufts College Medical School.....	(1922), (1934), (1937)		3
University of Michigan Medical School.....	(1935), (1937), (1938)		3
St. Louis University School of Medicine.....	(1935)		1
Columbia Univ. College of Physicians and Surgeons.....	(1938, 5)		5
Long Island College of Medicine.....	(1936), (1937, 2)		3
New York Medical College and Flower Hospital.....	(1938, 2)		2
New York University College of Medicine.....	(1934), (1936), (1937, 4), (1938, 7)		13
Syracuse University College of Medicine.....	(1938, 3)		3
University of Buffalo School of Medicine.....	(1938, 3)		3
University of Rochester School of Medicine.....	(1934)		1
University of Oregon Medical School.....	(1936)		1
Hahnemann Medical College and Hospital of Philadelphia.....	(1937), (1938)		2
Jefferson Medical College of Philadelphia.....	(1937), (1938)		2
Temple University School of Medicine.....	(1936), (1938)		2
University of Pennsylvania School of Medicine.....	(1937)		1
Woman's Medical College of Pennsylvania.....	(1937), (1938, 3)		4
Queen's University Faculty of Medicine.....	(1937, 2)		2
McGill University Faculty of Medicine.....	(1936), (1937)		2
Karl-Franzens-Universität Medizinische Fakultät, Graz.....	(1932)		1
Medizinische Fakultät der Universität Wien.....	(1919, 2), (1921), (1922), (1923), (1927), (1930), (1931), (1932), (1933), (1936, 4), (1937, 5), (1938, 7)		26
Deutsche Universität Medizinische Fakultät, Prag.....	(1929), (1934), (1935)		3
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England.....	(1937)		1
Université de Paris Faculté de Médecine.....	(1937), (1938, 4)		5

Université de Strasbourg Faculté de Médecine.....	(1916), (1938)		2
Université de Toulouse Faculté de Médecine et de Pharmacie.....	(1932)		1
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg.....	(1924), (1936)		2
Albertus-Universität Medizinische Fakultät, Königsberg.....	(1918), (1922), (1923), (1937)		4
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin.....	(1901), (1910), (1914), (1916, 2), (1921, 2), (1922, 2), (1924, 2), (1929), (1931), (1934), (1936)		15
Georg August-Universität Medizinische Fakultät, Göttingen.....	(1917)		1
Hamburgische Universität Medizinische Fakultät.....	(1920)		1
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main.....	(1922), (1923, 2), (1927), (1936), (1938)		6
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg.....	(1928)		1
Ludwig-Maximilians-Universität Medizinische Fakultät, München.....	(1898), (1920), (1921), (1934), (1936)		5
Medizinische Akademie Düsseldorf.....	(1933)		1
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn.....	(1938, 2)		2
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau.....	(1914), (1919), (1920), (1922), (1923, 2), (1924, 2), (1926), (1933), (1934), (1935)		12
Universität Heidelberg Medizinische Fakultät.....	(1921), (1922), (1934), (1937)		4
Universität Köln Medizinische Fakultät.....	(1923)		1
Universität Leipzig Medizinische Fakultät.....	(1911)		1
Universität Rostock Medizinische Fakultät.....	(1920)		1
Vereinigten Friedrichs-Universität Medizinische Fakultät, Halle-Wittenberg.....	(1932)		1
Magyar Királyi Ferencz József Tudományegyetem Orvostudományi Kara, Szeged.....	(1933)		1
National University of Ireland.....	(1937)		1
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia.....	(1935), (1936)		2
Regia Università degli Studi di Firenze. Facoltà di Medicina e Chirurgia.....	(1932), (1935)		2
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia.....	(1936, 2)		2
Regia Università degli Studi di Siena. Facoltà di Medicina e Chirurgia.....	(1936)		1
Regia Università di Pisa Facoltà di Medicina e Chirurgia.....	(1936)		1
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow.....	(1935), (1936), (1937), (1938, 5)		8
University of Glasgow Medical Faculty.....	(1924), (1926)		2
University of St. Andrews Conjoint Medical School, Scotland.....	(1936)		1
Universität Basel Medizinische Fakultät.....	(1935, 2), (1936, 3)		5
Universität Bern Medizinische Fakultät.....	(1935, 2), (1936), (1937, 6), (1938, 4)		13
Universität Zürich Medizinische Fakultät.....	(1936)		1
Université de Genève Faculté de Médecine.....	(1933), (1935)		2
Université de Lausanne Faculté de Médecine.....	(1935), (1937), (1938)		3

School	FAILED	Year Grad.	Number Failed
Georgetown University School of Medicine.....	(1934)		1
Loyola University School of Medicine.....	(1937, 2), (1938)		3
Rush Medical College.....	(1937)		1
Columbia University College of Physicians and Surgeons.....	(1923), (1938)		2
Long Island College of Medicine.....	(1935)		1
New York University College of Medicine.....	(1938)		1
Hahnemann Med. College and Hospital of Philadelphia.....	(1937)		1
Jefferson Medical College of Philadelphia.....	(1912)		1
Temple University School of Medicine.....	(1937)		1
Karl-Franzens-Universität Medizinische Fakultät, Graz.....	(1933)		1
Medizinische Fakultät der Universität Wien.....	(1919), (1920), (1921), (1924), (1925), (1926), (1929), (1930), (1934), (1938)		11
Deutsche Universität Medizinische Fakultät, Prag.....	(1922), (1934), (1937)		3
Université de Nancy Faculté de Médecine.....	(1936)		1
Université de Paris Faculté de Médecine.....	(1937), (1938)		2
Université de Strasbourg Faculté de Médecine.....	(1908)		1
Albertus-Universität Medizinische Fakultät, Königsberg.....	(1911), (1927)		2
Eberhard-Karls-Universität Medizinische Fakultät, Tübingen.....	(1922)		1
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen.....	(1922)		1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin.....	(1904), (1912), (1913), (1920, 2), (1921), (1922), (1923, 2), (1924), (1925), (1926), (1929), (1930), (1934), (1935), (1936, 2), (1937, 3)		21
Georg August-Universität Medizinische Fakultät, Göttingen.....	(1921), (1937)		2
Hamburgische Universität Medizinische Fakultät.....	(1922), (1935), (1936)		3
Hessische Ludwigs-Universität Medizinische Fakultät, Gießen.....	(1909), (1910)		2
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main.....	(1919), (1922), (1931), (1938)		4
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg.....	(1903), (1920), (1922, 2), (1928)		5
Ludwig-Maximilians-Universität Medizinische Fakultät, München.....	(1913), (1923, 3), (1935), (1937)		6
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn.....	(1920), (1938, 2)		3
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau.....	(1914), (1919), (1924)		3
Thüringische Landesuniversität Medizinische Fakultät, Jena.....	(1919)		1
Universität Heidelberg Medizinische Fakultät.....	(1910), (1922, 2), (1923), (1924)		5

Universität Köln Medizinische Fakultät.....(1923), (1924)	2	Long Island College Hospital.....	New York
Universität Leipzig Medizinische Fakultät (1902), (1911), (1923), (1925), (1936).....	5	Long Island College.....	New York
Vereinigten Friedrichs-Universität Medizinische Fakultät, Halle-Wittenberg.....(1919)	1	New York Homcopat.....	New York
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pecs.....(1926)	1	New York Medical College.....	New York
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia.....(1936, 2)	2	New York University, University and Bellevue Hospital Medical College.....	New York
Regia Università degli Studi di Pavia. Facoltà di Medicina e Chirurgia.....(1937)	1	New York University College.....	New York
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia.....(1932), (1935, 2), (1936, 7).....	10	Syracuse University College.....	New York
Regia Università degli Studi di Siena. Facoltà di Medicina e Chirurgia.....(1937)	1	Duke University School of Medicine.....(1934, 2), (1935) N. B. M. Ex.	New York
Regia Università di Napoli Facoltà di Medicina e Chirurgia.....(1932), (1936, 3), (1938)	5	Eclectic Medical College, Cincinnati.....(1936, 2), (1937, 2)	Ohio
Regia Università di Pisa Facoltà di Medicina e Chirurgia.....(1934), (1937)	2	Western Reserve University School of Medicine.....(1933)	Ohio
Uniwersytet Jozefa Pilsudskiego, Warszawa.....(1930)	1	Hahnemann Medical College and Hospital of Philadelphia (1924), (1930), (1933), (1934) Penna., (1937) Maryland, Ohio	
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow (1937), (1938, 2).....	3	Jefferson Medical College of Philadelphia.....(1933), (1935) Penna., (1935) Maryland, (1936) New York	
Universität Basel Medizinische Fakultät (1935), (1936, 2), (1937)	4	Medico-Chirurgical College of Philadelphia.....(1915) Penna., (1928), (1934, 2), (1936) Penna.	
Universität Bern Medizinische Fakultät (1934), (1936), (1937), (1938)	4	Temple University School of Medicine.....(1936), (1937, 2) N. B. M. Ex.	
Universität Zürich Medizinische Fakultät.....(1935), (1937, 2)	3	University of Pennsylvania School of Medicine.....(1932) N. B. M. Ex.	
Université de Genève Faculté de Médecine.....(1930), (1937)	2	(1934), (1936) New York, (1920), (1931), (1937, 2) Penna.	
University of Istanbul Medical Faculty.....(1916)	1	Woman's Medical College of Pennsylvania.....(1919), (1935) New York	
		University of Vermont College of Medicine.....(1908), (1935, 2) Vermont	
		(1933) N. B. M. Ex.	
		Medical College of Virginia.....(1935) Virginia	
		University of Virginia Department of Medicine.....(1928) Tennessee	
		(1931), (1935), (1937) Virginia	
		Marquette University School of Medicine.....(1937) Wisconsin	
		(1938) N. B. M. Ex.	
		Dalhousie University Faculty of Medicine.....(1937) N. B. M. Ex.	
		Queen's University Faculty of Medicine.....(1935) New York	
		McGill University Faculty of Medicine.....(1935) New York	
		Univ. of Bishop College Faculty of Medicine, Montreal (1905) Maine	
		Medizinische Fakultät der Universität Wien.....(1933), (1936) New York	
		Deutsche Universität Medizinische Fakultät, Prag.....(1933) New York	
		University of Sheffield Faculty of Medicine.....(1935) New York	
		Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg.....(1927) New York	
		Friedrich-Willhelms-Universität Medizinische Fakultät, Berlin.....(1919) New York	
		Universität Köln.....	New York
		Regia Università.....	Maryland
		Chirurgia.....	New York
		University of.....	New York
		Universität Be.....	N. B. M. Ex.
		Universität Zü.....	

Twenty-three physicians were licensed by endorsement from December 11 through December 31. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad. of
Yale University School of Medicine.....(1936), (1937) N. B. M. Ex.		
Georgetown University School of Medicine.....(1937) N. B. M. Ex.		
Howard University College of Medicine.....(1938) N. Carolina		
University of Georgia Medical Department.....(1925) Georgia		
University of Louisville Medical Department.....(1917) Vermont		
Johns Hopkins University School of Medicine.....(1919) N. Carolina		
Harvard Medical School.....(1937) N. B. M. Ex.		
St. Louis University School of Medicine.....(1938) Tennessee		
New York Medical College and Flower Hospital.....(1937) N. B. M. Ex.		
Eclectic Medical College, Cincinnati.....(1938) Ohio		
Hahnemann Med. College and Hospital of Philadelphia (1923) New Jersey		
Jefferson Medical College of Philadelphia.....(1928) Penna.		
Medico-Chirurgical College of Philadelphia.....(1915) Penna.		
University of Pennsylvania School of Medicine.....(1931) N. B. M. Ex.		
University of Tennessee College of Medicine.....(1932) Tennessee		
Baylor University College of Medicine.....(1938) Texas		
Medical College of Virginia.....(1935) N. B. M. Ex.		
Marquette University School of Medicine.....(1938) N. B. M. Ex.		
Medizinische Fakultät der Universität Wien.....(1924) New Jersey		
Deutsche Universität Medizinische Fakultät, Prag.....(1931) New Jersey		
Friedrich-Willhelms-Universität Medizinische Fakultät, Berlin.....(1934) Maryland		
University of Kharkov Faculty of Medicine.....(1915) Russia		

New Jersey Endorsement Report

Dr. E. S. Hallinger, secretary, State Board of Medical Examiners of New Jersey, reports 152 physicians licensed by endorsement during 1938. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad. of
University of Arkansas School of Medicine.....(1937, 3) Arkansas,		
(1937) New York		
College of Medical Evangelists.....(1925) Idaho, (1938) N. B. M. Ex.		
University of Southern California School of Medicine.....(1937) California		
Yale University School of Medicine.....(1935) N. B. M. Ex.		
George Washington University School of Medicine.....(1927) New York,		
(1935) Maryland		
Georgetown University School of Medicine.....(1928) New York,		
(1935), (1936, 2), (1937) N. B. M. Ex.		
Howard University College of Medicine.....(1925) Ohio,		
(1934) N. B. M. Ex., (1936) Tennessee		
University of Georgia School of Medicine.....(1937) Georgia		
Indiana University School of Medicine.....(1936) Indiana		
State University of Iowa College of Medicine (1910), (1930), (1935), (1936), (1937) Iowa		
University of Louisville School of Medicine.....(1928) New York,		
(1936), (1937) Kentucky		
Louisiana State University Medical Center.....(1938) Louisiana		
Johns Hopkins University School of Medicine.....(1916) New York,		
(1933) Maryland		
University of Maryland School of Medicine and College of Physicians and Surgeons.....(1934) Colorado,		
(1934), (1935, 3), (1936, 2) Maryland		
Boston University School of Medicine.....(1926) N. B. M. Ex.,		
(1931) Massachusetts, (1935) New York		
Harvard Medical School.....(1936) N. B. M. Ex.		
Tufts College Medical School.....(1918) New York,		
(1927) Massachusetts, (1931) Maine		
University of Michigan Medical School.....(1933), (1936) Michigan		
University of Minnesota Medical School.....(1935) Minnesota		
St. Louis University School of Medicine.....(1936) Penna.,		
(1937) Missouri		
Washington University School of Medicine.....(1934) Missouri		
Albany Medical College.....(1936) New York		
Columbia University College of Physicians and Surgeons.....(1933), (1934), (1936) N. B. M. Ex.,		
(1921), (1933), (1934, 2), (1935), (1936, 2), (1937) New York		
Cornell University Medical College.....(1928), (1935) New York,		
(1927), (1931), (1933), (1934), (1936) N. B. M. Ex.		

District of Columbia Reciprocity and Endorsement Report

Dr. George C. Ruhland, secretary, Commission on Licensure, reports twenty-three physicians licensed by reciprocity and one physician licensed by endorsement from Sept. 15 through Dec. 14, 1938. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine.....	(1934)		Maryland
Georgetown University School of Medicine.....	(1933), (1934)		Maryland
Howard University College of Medicine.....	(1931)		Penn.
(1932) Georgia, (1936) Maryland			
Emory University School of Medicine.....	(1922), (1934), (1935)		Georgia
University of Kansas School of Medicine.....	(1935)		Kansas
Johns Hopkins University School of Medicine.....	(1936)		Maryland
St. Louis University School of Medicine.....	(1936)		Missouri
Columbia Univ. College of Physicians and Surgeons.....	(1903)		New York
Long Island College Hospital.....	(1911), (1922)		New York
Western Reserve University School of Medicine.....	(1935)		Ohio
Hahnemann Med. College and Hospital of Philadelphia.....	(1924)		Maryland
University of Pennsylvania School of Medicine.....	(1925)		Penn.
Woman's Medical College of Pennsylvania.....	(1934)		Penn.
University of Tennessee College of Medicine.....	(1926)		Tennessee
Medical College of Virginia.....	(1932), (1936)		Penn.
Univ. of Virginia Department of Medicine (1932), (1936)			Virginia
School	LICENSED BY ENDORSEMENT	Year Endorsement Grad.	of U. S. Navy
University of Virginia Department of Medicine.....	(1911)		

Idaho October Examination

Hon. J. L. Balderston, former commissioner of law enforcement, reports the written examination held by the Idaho State Medical Examining Board, Oct. 3-5, 1938. The examination covered twenty-three subjects and included 160 questions. An average of 75 per cent was required to pass. Fifteen candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Pct. Cor.
College of Medical Evangelists.....(1937)	76		
University of Colorado School of Medicine.....(1937)	76		
George Washington University School of Medicine.....(1935)	76		
Northwestern University Medical School.....(1936) 78,	76		
Rush Medical College.....(1937) 78,	76		
University of Michigan Medical School.....(1937) 78,	76		
Washington University School of Medicine.....(1937) 78,	76		
University of Nebraska College of Medicine.....(1917) 83, (1936) 85,	76		
Univ. of Oregon Medical School.....(1937) 81,	76		
University of Texas School of Medicine.....(1935)	76		
McGill University Faculty of Medicine.....(1935)	76		
Schlesische-Friedrich-Willhelms-Universität Medizinische Fakultät, Breslau.....(1935)	76		

Louisiana December Report

Dr. Roy B. Harrison, secretary, Louisiana State Board of Medical Examiners, reports the written examination held in New Orleans, Dec. 1-3, 1938. The examination covered twelve subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-nine candidates were examined, all of whom passed. Fourteen physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine.....	(1938)	81.2	83.9
University of Southern California School of Medicine.....	(1938)	86.4	
Howard University College of Medicine.....	(1937)	82.2	
Emory University School of Medicine.....	(1936)	82.5	85.2
Loyola University School of Medicine.....	(1937)	82.2	
Northwestern University Medical School.....	(1938)	82.3	
Indiana University School of Medicine.....	(1937)	83.1	
Louisiana State University Medical Center.....	(1938)	85.3	87.4*
Tulane University of Louisiana School of Medicine.....	(1937)	83.1	
86.6, (1938) 78.9, 79.7, 82.7, 85.2†			
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1938)	81.8	84.2
University of Minnesota Medical School.....	(1938)	83.3	
New York University College of Medicine.....	(1938)	84.9	
University of Oklahoma School of Medicine.....	(1938)	86.7	
University of Cincinnati College of Medicine.....	(1938)	84*	
University of Oregon Medical School.....	(1938)	85.4	
Medical College of the State of South Carolina.....	(1938)	83.5	
Baylor University College of Medicine.....	(1938)	79.4	
University of Virginia Department of Medicine.....	(1938)	83.3	
University of Wisconsin Medical School.....	(1938)	85.1	
Queen's University Faculty of Medicine.....	(1930)	78.1†	

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine.....	(1937)		Arkansas
Rush Medical College.....	(1901)		Illinois
Tulane University of Louisiana School of Medicine.....	(1935)		S. Carolina
University of Michigan Medical School.....	(1930)		Michigan
University of Minnesota Medical School.....	(1935)		Minnesota
University of Nebraska College of Medicine.....	(1933)		Nebraska
Meharry Medical College.....	(1928)		Tennessee
University of Tennessee College of Medicine.....	(1932), (1936)		Tennessee
Vanderbilt University School of Medicine.....	(1935)		Mississippi
Baylor University College of Medicine.....	(1936)		Texas
Medical College of Virginia.....	(1931)		Virginia
University College of Medicine, Virginia.....	(1912)		Virginia
University of Wisconsin Medical School.....	(1937)		Kansas

* This applicant has completed the medical course and will receive the M.D. degree on completion of internship. License has not been issued.
† Granted a Temporary Permit. License withheld pending completion of United States citizenship.

Wisconsin September Reciprocity Report

Dr. Henry J. Gramling, secretary, Wisconsin State Board of Medical Examiners, reports five physicians licensed by reciprocity at the meeting held in Milwaukee, Sept. 14, 1938. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Illinois College of Medicine.....	(1937)		Illinois
University of Minnesota Medical School.....	(1931)		Minnesota
Washington University School of Medicine.....	(1935)		California
University of Nebraska College of Medicine.....	(1931)		Nebraska
Marquette University School of Medicine.....	(1936)		Montana

National Board of Medical Examiners

The National Board of Medical Examiners reports that its certificate was awarded to eighty-seven applicants who were successful in the examinations in part III held in the fall of 1938. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
College of Medical F.....	(1938)	(1938)	6
Stanford University.....			2
University of Colorado.....			1
Yale University Sch.....			2
George Washington.....			1
Georgetown Univers.....			3
University of Georg.....			1
Northwestern University Medical School.....	(1938)		1
State University of Iowa College of Medicine.....	(1937)		1
Johns Hopkins University School of Medicine (1933), (1937, 5)			6
Boston University School of Medicine.....	(1936), (1937, 11)		12
Harvard Univ. Medical School.....	(1935, 5), (1936, 5), (1937, 2)		12
Tufts College Medical School.....	(1932), (1936), (1937, 5)		7
University of Michigan Medical School.....	(1935), (1937)		2
St. Louis University School of Medicine.....	(1935), (1937)		2
University of Nebraska College of Medicine.....	(1936)		1
Columbia University College of Physicians and Surgeons (1936)			1
Cornell University Medical College.....	(1936)		1
New York Medical College and Flower Hospital.....	(1937, 6)		6
Syracuse University College of Medicine.....	(1936)		1
Duke University School.....			2
University of Oklahoma.....			1
University of Pennsylvania.....			1
University of Vermont C.....			6
Marquette University Sc.....			1

University of Wisconsin Medical School.....	(1935)	1
McGill University Faculty of Medicine.....	(1937, 2)	2
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England.....	(1935)	1
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg.....	(1935)	1
Universität Bern Medizinische Fakultät.....	(1937)	1
Université de Lausanne Faculté de Médecine.....	(1920)	1

Ohio May-June Examination

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports the oral, written and practical examination held at Columbus, May 31-June 3, 1938. The examination covered ten subjects and included eighty questions. An average of 75 per cent was required to pass. Three hundred and five candidates were examined, 297 of whom passed and eight failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Med.....			82.1
Loyola Univers.....			81.5,
Northwestern.....			(1938) 81.7, 86.9, 87.8
Rush Medical College.....	(1937)	81.8, (1938) 83.5,	87.7
School of Medicine of the Division of Biological Sciences (1937)			88.1
University of Illinois College of Medicine.....	(1938)		86.9
University of Minnesota Medical School.....	(1937)		88.5
Creighton University School of.....			81.6
University of Rochester School.....			80.6,
82.8, 82.9, 84.2, 85.6, 87.4, 87.8			
Eclectic Medical College, Cincinnati.....	(1938)		80.2,
81.3, 81.5, 82.3, 82.3, 83.2, 83.3, 83.4, 83.6, 83.9, 84, 84.2, 84.3, 84.3, 84.4, 84.6, 84.8, 85.1, 85.2, 85.3, 85.5, 85.6, 86.8, 86.8, 87.1, 87.2, 87.2, 87.3, 87.6, 88.1, 88.4, 89.7			
Ohio State University College of Medicine.....	(1938)		79.4,
79.7, 79.8, 80.3, 80.4, 80.5, 80.5, 80.7, 80.8, 81, 81.1, 81.3, 81.4, 81.5, 81.6, 81.7, 81.8, 81.9, 82.1, 82.1, 82.2, 82.2, 82.2, 82.3, 82.4, 82.4, 82.4, 82.4, 82.5, 82.8, 82.9, 83.1, 83.1, 83.1, 83.2, 83.4, 83.4, 83.4, 83.5, 83.5, 83.6, 83.6, 83.6, 83.6, 83.7, 83.7, 83.8, 83.8, 83.9, 83.9, 83.9, 83.9, 84, 84.1, 84.2, 84.3, 84.5, 84.6, 84.7, 84.7, 84.7, 84.8, 84.8, 84.9, 84.9, 85.1, 85.2, 85.2, 85.3, 85.4, 85.5, 85.8, 85.9, 85.9, 85.9, 86.1, 86.3, 86.4, 86.5, 86.5, 86.7, 86.8, 86.9, 87.2, 87.3, 87.3, 87.4, 87.7, 87.8, 88.1, 90.3			
University of Cincinnati College of Medicine.....	(1938)†		80.3,
80.6, 80.6, 80.9, 81, 81.2, 81.3, 81.4, 81.4, 81.9, 81.9, 81.9, 82, 82, 82.1, 82.4, 82.6, 82.7, 83.1, 83.2, 83.2, 83.3, 83.4, 83.4, 83.4, 83.5, 83.6, 83.7, 84, 84, 84, 84, 84.1, 84.1, 84.1, 84.1, 84.2, 84.2, 84.2, 84.3, 84.6, 84.6, 84.8, 85, 85.1, 85.2, 85.3, 85.3, 85.4, 85.4, 85.5, 85.7, 85.8, 85.9, 86, 86.1, 86.2, 86.2, 86.3, 87.3, 87.4, 87.9, 88.5, 88.7			
Western Reserve University School of Medicine.....	(1938)		79.5,
79.8, 80.3, 80.8, 80.8, 81.2, 81.4, 81.4, 81.7, 82, 82.3, 82.4, 82.4, 82.9, 83.3, 83.4, 83.5, 83.6, 83.7, 83.7, 83.7, 83.9, 83.9, 84, 84.1, 84.3, 84.3, 84.3, 84.4, 84.4, 84.5, 84.6, 84.7, 84.7, 84.9, 84.9, 84.9, 85, 85.1, 85.1, 85.3, 85.5, 85.7, 85.7, 85.7, 85.7, 85.7, 85.9, 86, 86, 86.3, 86.5, 86.5, 86.5, 86.6, 86.7, 86.8, 86.8, 87.4, 87.8, 87.8, 88.7			
Jefferson Medical College of Philadelphia.....	(1937)		84.7
University of Pennsylvania School of Medicine.....	(1937)		84.7
Woman's Medical College of Pennsylvania.....	(1938)		83.9
Marquette University School of Medicine (1938)	82.2, 82.4, 82.5,		82.8, †
University of Toronto Faculty of Medicine.....	(1937)		85.9
McGill University Faculty of Medicine.....	(1938)		81.7
Medizinische Fakultät der Universität Wien.....	(1937)		83.7
Deutsche Universität Medizinische Fakultät, Prag.....	(1927)		76.3
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg.....	(1917)		78
Christian-Albrechts-Universität Medizinische Fakultät, Kiel.....	(1925)		77.7
Georg August-Universität Medizinische Fakultät, Göttingen.....	(1919)		76.8
Hessische Ludwigs-Universität Medizinische Fakultät, Giessen.....	(1927)		78.7
Ludwig-Maximilians-Universität Medizinische Fakultät, München.....	(1937)		80.5
Universität Heidelberg Medizinische Fakultät.....	(1931)		80.6
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia.....	(1936)		77.5
Licentiate of the Royal College of Physicians, Licentiate of the Royal College of Surgeons, Edinburgh, and Licentiate of the Royal Faculty of Physicians and Surgeons, Glasgow.....	(1937)		81.9
School.....	FAILED	Year Grad.	
Loyola University School of Medicine.....	(1938)		
Université de Paris Faculté de Médecine.....	(1926)		
..... Fakultät, Freiburg.....	(1929)		
..... Fakultät, München.....	(1907)		
..... Medizinische Fakultät.....			
Breslau.....	(1917)		
Universität Heidelberg Medizinische Fakultät.....	(1908)		
Regia Università degli Studi di Genova. Facoltà di Medicina e Chirurgia.....	(1924)		
Université de Lausanne Faculté de Médecine.....	(1936)		

* These applicants have completed the medical course and will receive the M.D. degree on completion of internship. Licenses have not been issued.

† These applicants have received the M.B. degree and will receive the M.D. degree on completion of internship.

‡ This applicant has completed the medical course and will receive the M.D. degree on completion of internship. License has not been issued.

Book Notices

The Relation Between Injury and Disease. By Jewett V. Reed, B.S., M.D., F.A.C.S., Assistant Professor of Surgery, Indiana University, Indianapolis, and Charles P. Emerson, A.B., M.D., D.Sc., Research Professor of Medicine, Indiana University. Collaborating: E. B. Mumford, B.S., M.D., F.A.C.S., Consultant U. S. Veterans Bureau Hospital. Cloth. Price, \$7.50. Pp. 577, with 21 illustrations. Indianapolis: Bobbs-Merrill Company, 1938.

A new and strange pseudopathology has been slowly evolving in the courts, based on so-called expert medical testimony, especially in connection with diseases of industrial workers, alleged to be the result of injury. This strange pseudopathology will become more and more unscientific unless physicians in court become more determined to substitute proper *hoc* reasoning for the post hoc arguments which in many cases determine decisions. Physicians in cases of injury in which there is an element of liability recognize that many of the settlements made are unfair if judged on their scientific merits although just in view of the medical testimony presented to the court. Many injured persons receive little or nothing for physical disabilities justly compensable, while others receive awards for diseases not due to injury. The purpose of this book is to reduce the number of such injustices. It is designed to be helpful especially to (1) lawyers who present accident cases before courts and boards, (2) officials of insurance companies which carry casualty risks and (3) physicians and surgeons. It is based on the authors' thirty-six years of experience. Their discussions are limited to well recognized diseases; in some injury may be a primary etiologic factor, in others it never is and in still others it may modify the course. In the study of cases in which trauma and disease are assumed to be associated the physician should critically scrutinize the history of the accident and separate the actual facts of the injury from the statements given by the patient. He should also have personal knowledge of all the features of the patient's disease and be accurately informed as to all the factors which could possibly have entered into its cause.

Nouvelle pratique dermatologique. Publiée par MM. Darier, Sabouraud, Gougerot, Millan, Pnuitier, Ravaut, Sézary, Clément Simon. Secrétaire Général: Clément Simon. Tome VIII. Dermatologie topographique; thérapeutique; médecine légale; table alphabétique. Par MM. P. Blum et al. Half-Cloth. Price, 300 francs. Pp. 867, with 178 illustrations. Paris: Masson & Cie, 1936.

The first 380 pages of volume VIII, which brings to a close this huge work, are devoted to topographic dermatology. This is of great value to the general practitioner but of much less value to the specialist in that it is largely repetitious. It is interesting, however, owing to the fact that it is the first contribution of its kind since the work of Sabouraud, which appeared in 1905 and which was translated into several languages.

Sabouraud and Pignot in fifty-two pages cover the semeiology of the scalp. About the same number of pages are taken up by Bory on the topographic dermatology of the face and nose. The illustrations in this article are numerous and excellent. Fernet follows with about eighty pages on the lips, mouth and tongue. This constitutes a valuable contribution to the volume and, although the illustrations are not as numerous as in the preceding article, they are in sufficient number and of the highest quality. A short paper by Montlaur on the topographic dermatology of the large folds is thorough and of much value even to the specialist. Thorel contributes a short article on the male external genitalia and Bralez does the same on the female external genitalia. The illustrations in both are all that could be desired. Gonin gives a few paragraphs to each of the many conditions affecting the anal region. Burnier makes the most of the pages allotted him to list and describe the disorders of the hands and feet. Payenneville describes the dermatoses of the mammae, and Blum those of the umbilicus.

The second half of the volume is devoted to therapeutics, plastic surgery and medicolegal dermatology with an introduction by Darier. Fernet discusses the general hygiene of the skin and scalp. This is followed by forty-four pages on general therapy by Darier and Dreyfus. Included are such subjects as internal treatment of cutaneous accidents, treatment of the cutaneous sensitization by hemotherapy and serotherapy, peptone therapy, lactotherapy, urinothrapy and the use of the "sub-

stance P" of Oriel, heat therapy, vaccinothrapy and chemo therapy. Under the last heading the drugs used in dermatology are listed alphabetically and discussed in detail. The various regimens are then taken up, acid and alkaline regimens, the methods of modifying the metabolism of the skin, modification of the vitamin equilibrium, uric acid, the fats and the proteins. Glandular therapy is thoroughly covered, after which the chapter is ended with several pages devoted to treatment of the central nervous system.

Fernet and Heurre contribute an exhaustive article of forty pages to internal treatment of the dermatoses, sixteen pages to pharmaceuticals and forty-two pages to external treatment.

The physical agents used in dermatology are discussed and evaluated by Girondeau. The author describes the indications for and the technic of the use of the douche filiforme, hot air, actinothrapy, infra-red high frequency currents, the diathermic or electric bistoury, the galvanic current, electrolysis, ionization and electrical baths.

Cottenot covers, as well as any one could in forty-three pages, the technic and the results of the use of the roentgen ray and radium in dermatology. Solente describes the preparation of carbon dioxide snow and the technic of its application to lesions of the skin. Although many dermatologists hesitate to treat epitheliomas with the snow, the author does not hesitate to use it in selected cases and finds the results superior to those of any other method.

Ravaut has thoroughly covered the field of electrocoagulation in forty pages. There are many illustrations showing the marvelous results it is possible to attain with this method. The pictures of the epitheliomas of the face and the left hand and of the melanomas of the face and the foot are particularly impressive.

An excellent chapter on plastic surgery is contributed by Dufourmentel. The technic for face lifting and for correction of various deformities of the face is set forth in much detail and illustrated with line drawings. A most interesting part of the chapter is the method of correcting ptosis of the mammae. The illustrations shown before and after treatment would seem to indicate conclusively that the technic is highly successful in such cases.

The volume closes with a chapter on medicolegal dermatology by Vivatte and Sidi. Obviously this chapter, which is thorough, is primarily for the French and has little to offer to dermatologists of other countries.

An excellent index of sixty-eight pages is appended.

Giants of Medicine in Pioneer Kentucky: A Study of Influences for Greatness. By William Allen Pusey, A.M., M.D., LL.D. [Reprinted from February 1938 issue of Medical Life.] Boards. Pp. 33-64. New York: Froben Press, 1938.

Having been reared in Kentucky and having personal knowledge of its geography, its people and its resources, William Allen Pusey is in the fortunate position of being able to portray the courage, resourcefulness, vision and ability of its pioneers and with a facile pen to pay tribute to their attainments. This he has interestingly and adequately done. The circumstances under which these pioneers lived and worked, including a lack of hospitals, of trained nursing personnel, of a knowledge of surgical cleanliness, of instruments of precision as we now know them, of the aid of the blessed insensibility of anesthesia and the presence of inherent and seemingly insuperable difficulties, make the incredulity of their contemporaries readily understandable and emphasize their claims to renown for the development of greatness. Bardstown, with the most illustrious courts and bar in the West, had but 820 inhabitants when Brashear did the first hip joint amputation in 1806. Danville, with McDowell's home under the shadow of the state capitol, had but 432 inhabitants in 1809, when he did his first ovariectomy, and but 804 at the time of his death in 1830. Lexington, the Athens of the West, then as now a remarkable town in a wonderful country, had but 1,795 inhabitants at the time of the establishment of the medical school, Transylvania University, in 1799, and but 6,997 when Dudley was at the zenith of his career. In his study of the influences for greatness to be found in a then virgin country, inhabited by hostile savages and the beasts of the forest, Dr. Pusey gives due credit to the type of people who settled this frontier, well equipped physically, mentally and socially for the struggle for the survival of the fittest. They

were well endowed with those qualities for which Americans are noted the world over, independence of thought, enthusiasm of purpose, courage to undertake and patience to carry through: in the words of Dr. Pusey "a vigorous breed of men trained to its highest efficiency by the exactions of frontier life." Written in beautiful clear language, this history of medical pioneers proves an entrancing one.

Der Magenkrebs. Von Dr. med. Georg Ernst Konjetzny, o. ö. Professor der Chirurgie der Hansischen Universität, Hamburg. Cloth. Pp. 289, with 155 illustrations. Stuttgart: Ferdinand Enke, 1938.

Konjetzny, one of the foremost authorities on the subject, summarizes thirty years of study of the problem of gastric carcinoma. He reaffirms the views previously published, coordinates the data, adds much new material and presents a complete picture of our present knowledge of the genesis of gastric carcinoma and its clinical application. In the introduction he calls attention to the well known fact that the stomach is the organ most frequently affected by carcinoma and that today the majority of patients so afflicted come to the internist and the surgeon too late for cure. In the battle against gastric carcinoma only two possibilities exist: prophylaxis or early radical surgical treatment. Under the heading of etiology Konjetzny discusses first the rôle of heredity and concludes that cancer as such is not inherited, only a certain tendency or organ disposition. External conditions are thought to be the more important factors. The theory of contagiousness and infectivity seems disproved, as does the Cohnheim concept of carcinoma arising from embryonal cells left over after the development of the fetus and its organs. Trauma is considered significant only as it relates to the sequelae of corrosion of the mucosa, as in acid or alkali poisoning. Virchow's theory of carcinoma as a resultant of local disease processes is accepted, and a large section of the monograph is devoted to the thesis that "the chronic inflammatory conditions which demand greatest consideration as the basis of gastric carcinoma formation are the chronic gastritis with its sequelae and the chronic gastric ulcer."

Konjetzny's life work indeed has been the study of the relationship between chronic gastritis, benign ulcer and carcinoma. He views gastritis as the basis for both ulcer and carcinoma. In his experience gastric carcinoma is always associated with a pronounced chronic atrophic or atrophic-hyperplastic gastritis. Carcinoma never develops in a normal gastric mucosa. The essential process in the gastritis-carcinoma relationship is not the inflammation but regenerative changes in the epithelium constantly induced by it. The complete transition from pure gastritic changes to polyp formation and carcinoma is described in detail and well documented with convincing illustrations. The carcinomatous development begins in the cells over a broad area of the mucosa and hence is multicentric in origin. The subject of carcinomatous transformation of a benign ulcer is discussed at length. The conclusion is reached that it is not possible by clinical methods alone to make such a diagnosis. Pathologic evidence, especially the histologic, is more definite, but here also difficulties exist. The diagnosis cannot be made on the basis of any single pathognomonic finding but rather by a careful analysis of all the evidence. Carcinoma may develop in the edge of a benign ulcer or adjacent to the ulcer but independent of it, related not to the ulcer but to the gastritis, to which Konjetzny attributes both the ulcer and the carcinoma. With regard to the differentiation of ulcer-gastritis and carcinoma-gastritis Konjetzny says that in ulcer the gastritis is usually more acute and is localized to the antrum whereas in carcinoma the gastritis tends to be more chronic and to involve larger areas of the gastric mucosa. There is, however, no specific or fundamental difference.

Among the macroscopic forms of carcinoma Konjetzny distinguishes (1) the pronounced mushroom or polypoid tumor, which develops chiefly in the lumen of the stomach, (2) the ulcerated dishlike growth with clearly defined borders, (3) the ulcerated carcinoma without a definite wall or a sharp border and with infiltration of the gastric wall beyond the edge of the ulcer and (4) the definitely diffuse type in which the borders of the tumor are not palpable, usually beginning in the antrum,

and consisting particularly of the so-called linitis plastica and carcinoma fibrosum. The microscopic types are variable and are not to be correlated with the macroscopic. The prognosis for surgical treatment is, on the whole, much better in the first and second groups than it is in the third and fourth. A histologic classification is not of much prognostic value.

Effective therapy depends first on early examination and second on gastric resection of all early carcinomas and indeed of all cases of polypoid gastritis, this being definitely a pre-carcinomatous, if not already carcinomatous, condition. All patients with digestive symptoms should report promptly to the physician, who should use all available diagnostic means necessary for the establishment of a definite diagnosis. The history, physical examination and gastric analysis are not sufficient but should be combined with a search for occult blood in the stool and with careful roentgenologic and gastroscopic examination. These methods are most valuable. The author is opposed to exploratory laparotomy as a diagnostic procedure because the methods mentioned are reliable and also because small carcinomas often cannot be palpated even when the surgeon has the stomach in his hands. When a portion of the stomach is held in suspicion clinically, it should be resected. Resection should be carried out in almost all cases of carcinoma even though a very radical operation is required, such as complete gastrectomy or partial gastrectomy combined with partial colectomy. The chief contraindications to resection are definite, proved distant metastases or extensive carcinomatous peritonitis. Significant palliative effects have been obtained even when Krukenberg tumors had to be removed in addition to the gastric lesion. In spite of the fact that Hitzenger and Merkle found thirteen year cures in only 2 per cent of 272 patients with gastric carcinoma, Konjetzny feels that undue pessimism is not warranted even in the young. The longest cure observed in the Breslau clinic was that of a man operated on when 31 years old and was known to be well twenty-one years later. With earlier diagnosis and earlier radical resection, better results should be obtained.

Essentials of Medicine. By Charles Phillips Emerson, M.D., Research Professor of Medicine, Indiana University, Indianapolis, and Nellie Gates Brown, R.N., Director of Training School for Nurses, Ball Memorial Hospital, Muncie, Indiana. Thirteenth edition. Cloth. Price \$3. Pp. 845, with 164 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1938.

The evolution of this volume through thirteen editions since 1908 has been an account of medical and nursing school programs during the last thirty years. Originally intended as a primer for the medical student's study of disease, the book at present is chiefly in the hands of the student nurse. The authors in preparing this edition have patterned it on the unit plan, following suggestions in the curriculum guide for schools of nursing. A section of doubtful value is the one intended to encompass the field of public health and medical sociology, an impossible task in five pages. Furthermore, with the mention of a drug such as sulfanilamide, the failure to list and discuss the toxic signs and symptoms is a real error, especially at a time when all are interested in this new drug and its dangers. The student nurse here has presented for her the essentials of medicine in a concise yet readable 1, 2, 3 form. The volume should continue to be one of the most popular in the series of nursing manuals.

Malaria in the Netherlands. By N. H. Swellengrebel and A. de Buck. Cloth. Price, 5 florins. Pp. 267, with 25 illustrations including 2 plates. Amsterdam: Schellema & Holkema, Ltd., 1938.

The authors, both from the Institute of Tropical Hygiene of Amsterdam, have presented an interesting book on an old but ever changing and expanding theme. One might think that such a subject would be dry and uninteresting, but this book is presented in such a way that it easily holds the attention. The authors have done a perfectly tremendous amount of careful and continued investigation, and one must be impressed by the enormous amount of difficult work involved in gathering the data presented.

It is something of a surprise to know that the Netherlands presents such a serious malarial problem. It lies far to the north and even though it is low and full of canals, one would naturally think of malaria as only an occasional importation

as it is in most of our northern latitudes. But the authors show that special development and adaptation of a short-winged anopheles mosquito is such that the malarial parasites remain active after the sexual activities have subsided and that the mosquitoes are able to convey infections actively until December, by remaining constantly in the homes of the inhabitants and more or less regularly feeding on them. Even though thousands are diverted into stables and feed on live stock there are so many mosquitoes that most houses contain some, hidden away in dark recesses, where they are not easily found. The number seems to be in direct relation to the efficiency of the housekeeper.

Some progress has been made in malaria control, but the authors show how many difficult problems are involved, healthy carriers being one of the most difficult. Each new addition of territory reclaimed from the sea adds a new focus. It appears that the ditches draining the land are the source of most of the mosquito breeding. The short-winged variety breeds best in water of rather high salinity, while the long-winged anopheles, also abundant, breeds in fresh water but appears not to be a vector of any importance. The authors conclude that satisfactory control will come only at a later time when the canals are so diluted with fresh water that the short winged vectors will be largely eliminated.

A final and instructive chapter is included on the treatment of dementia paralytica with malaria and a description of the careful control exercised, as well as the valuable studies made on the life cycle of malarial parasites in these carefully controlled observations. The material is convincing and will be of value to any one engaged in public health work, but it is by no means limited to this field. Every doctor who comes in contact with malaria will profit by its perusal.

Pathological Technique: A Practical Manual for Workers in Pathological Histology Including Directions for the Performance of Autopsies and for Microphotography. By Frank Burr Mallory, A.M., M.D., S.D., Consulting Pathologist in the Boston City Hospital, Boston, Mass. Cloth. Price, \$1.50. Pp. 414, with 11 illustrations. Philadelphia & London: W. B. Saunders Company, 1938.

Little fault can be found with this small work on the methods for staining and handling tissues removed from the body for further study. Everything in the book has been accepted as proper technique in most of the country's major laboratories. This is merely intended to be a compend of accepted practical techniques and as such is little concerned with theory or complicated methods. The results to be expected from each stain are listed at the end of each description of method. The descriptions are highly practical, are listed in outline form and are sufficiently complete. The portion on rapid frozen section technique is too brief, since such cursory dismissal does not permit description of modern technique highly useful to the surgical pathologist. However, this volume seems aimed at the postmortem laboratory and as such a fairly complete treatise on necropsy procedure is presented. There are some tables and a brief section on photography, the latter being useless to the professional and a bit too difficult and brief for the amateur. Illustrations are few, an omission painfully noticeable in a laboratory manual. This brief volume describes most of the stains necessary for use in a well equipped laboratory and would make a valuable addition to a pathologist's library.

Die Ernährung der olympischen Kämpfer in Vorgehen und Gegenwärt. Von Adolf Bickel, Professor der pathologischen Physiologie an der Friedrich-Wilhelms-Universität, Berlin. *Bücher der Hygiene und Volks-ernährung, Band III.* Herausgegeben von Dr. Max Winkler. Paper. Price, 1 mark. Pp. 36. Berlin: Deutsche Verlagsgesellschaft m. b. H., 1938.

This little book is a lecture delivered by the author on invitation to the Academy of Medicine of Athens, Greece. It is a relatively popular application of part of the thesis of his longer book, *The Relation of the Quality of Protein to the Process of Assimilation*, published in Basle by Benno Schwabe & Co. in 1938. The book is of primary interest to general physiologists, nutritionists, team physicians and those interested in research in the physiology of exercise. It is of general interest to the sportsman physician. The author has investigated sources, including Gardiner's Greek Athletic Sports and Festivals, for information concerning the type of diet used by

the athletes of the ancient Olympic period. He has compared the ancient diet with that of various groups of participants in the 1936 Olympics at Berlin. In view of his observation that the diet consisted primarily of animal and vegetable protein in both groups, the paper inquires into the possible reasons for this emphasis. The work of Zuntz, Loewi, Mueller and Caspari in 1906 indicated that alpine climbers with "arbeits hypertrophie" established indulged their heavy activity using a diet relatively free from protein and composed mostly of the so-called energy foods with no noticeable detrimental physical effects. Attempt is made to rationalize the high protein diet, postulated as the athlete's instinctive choice, on the basis of the increase in oxidation accompanying high protein intake and the rallying of glycogen from known and possibly improved sources to meet the strain of heavy athletic training and competition. Consideration by tables is given the relative value and oxidizing influence of some forty forms of protein, as well as their possible effects on glycogen availability and storage.

A Text-Book of Dental Histology and Embryology Including Laboratory Directions. By Frederick Bogue Noyes, B.S., D.D.S., S.D. 31th edition. Edited by Isaac Schour, B.S., D.D.S., M.S., Professor of Histology and Head of Department, University of Illinois College of Dentistry, and Harold Budd Noyes, B.S., D.D.S., M.D. Cloth. Price, \$6.50. Pp. 415 with 281 illustrations and 15 plates. Philadelphia: Lea & Febiger, 1937.

For twenty-five years this eminently practical textbook has served as an introduction to dental training, covering as it does a much wider field than the title indicates. This edition reflects the newer ideals and standards of scientific dentistry. When one considers the chapters on the postnatal development of the head, the lymphatic system and tooth eruption and the discussions of comparative and experimental anatomy, the book is really a work on the biology of the teeth. The developing tooth, with its rapid, regular growth and its immediate response to certain changes in the blood, is becoming a veritable growth kymograph, and this type of book commands a general scientific audience (even though the chapter on operative dentistry is likely to set the layman's teeth on edge). Dr. Schour has reorganized the material and has added much that is new. Pathologic conditions, especially caries, are included, as well as normal structure, but the emphasis is kept on the physiologic interpretation of minute structure. The introductory chapters on embryology are followed by descriptions of the histogenesis and definitive structure of the various dental tissues. Here the "histophysiologic remarks" are provocative and stimulating. Thus (p. 113) one reads: "Enamel automatically records in its structure its own stages of formation and calcification as well as its response to systemic disturbances. These records remain permanent after the enamel has completed its formation and calcification and has lost the kymographic properties of its growing period." The new chapter on gums and gingivae is excellent. There are an appended laboratory outline and a good index.

Beitrag zur Kenntnis sklerosierender Entmarkungsprozesse im Gehirn mit besonderer Berücksichtigung der diffusen Sklerose (Strümpell-Hubner). Eine klinisch-anatomische Studie. Von László Elnarson, Professor an der Universität Aarhus, und Axel V. Neeb, Privatdozent Psych. Laboratorium d. Universität Kopenhagen. Acta Jutlandica. 160, with 72 illustrations. Copenhagen. Einar Munksgaard, Leipzig. Georg Thieme, 1938.

This monograph is based on a careful clinical and microscopic study of six new cases of demyelinating lesions of the brain. In four of these cases the condition belonged to the class of the Strümpell-Hubner diffuse sclerosis and in the other two it was difficult to classify. On the basis of this study the authors come to a new classification of the demyelinating diseases and attempt to interpret cases reported in the literature in the light of their new conception. They distinguish five types: (1) the blastomatous reactive form, (2) the exogenous inflammatory form, (3) the nonfamilial degenerative form, (4) the hereditary degenerative familial form and (5) the peculiar concentric sclerosis of Baló. They propose as a generic term for all these lesions "leuko-encephalopathia scleroticans diffusa." Their classification is based on the microscopic appearances, and they believe that with all these lesions many and varied etiologic factors play a part simultaneously. The monograph is well illustrated and has an extensive bibliography. It will be useful to any neuropathologist interested in this interesting group of pathologic conditions.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Use of Drugs or Operative Surgery by Osteopath Unlawful.—Frankowsky, an osteopath, was licensed in Illinois to treat human ailments without the use of drugs or operative surgery. He was convicted of practicing medicine by the use of drugs, medicines or operative surgery and appealed to the Supreme Court of Illinois.

The medical practice act of Illinois provides for the issuance of three kinds of licenses: (1) to practice medicine in all its branches; (2) to treat human ailments without the use of drugs or medicines and without operative surgery, and (3) to practice midwifery. Frankowsky contended that the act was unconstitutional because its classification of practitioners was false, arbitrary, discriminatory and unscientific. He further argued that the practice of osteopathy includes the use of operative surgery, antiseptics and anesthetics but that, under the act, he could not be licensed to practice osteopathy according to its tenets, including surgery, unless he also studied the use of drugs and medicines in which he did not believe. But, the Supreme Court pointed out, the constitutionality of the medical practice act had been repeatedly upheld. In *People v. Witte*, 315 Ill. 282, 146 N. E. 178, 37 A. L. R. 672, the court specifically upheld the reasonableness of the division of all practitioners who seek to cure human maladies into two classes, one class consisting of those having the right to practice medicine in all its branches, including operative surgery, and the other class consisting of those who seek to treat human ailments without the use of medicines or operative surgery. Such a classification is based on a difference in attainments and not on any named method or school of healing. The legislature was not bound to enact a statute which provided for the licensing of applicants from the various schools of healing by creating a separate class for each school with distinct qualifications. The limitations laid down in the statute are voluntary; if an applicant who believes in curing human ailments without the use of drugs or surgery desires to use either, he may qualify himself by meeting the requirements of the statute for a license to practice medicine in all its branches. Frankowsky's contention that he was discriminated against because, in order to practice surgery, the act required him to take instruction in the use of drugs and medicines when he did not believe in their use was answered in the *Witte* case as follows:

The practice of surgery requires the use of antiseptics, anaesthetics, and other drugs and medicines. Hence the Legislature required instruction in drugs and medicines as a necessary qualification to enable a physician to perform a surgical operation. In its judgment, no person ought to be permitted to practice surgery without showing a knowledge of drugs and medicines.

Because in the judgment of the Supreme Court no new ground of attack on the constitutionality of the medical practice act had been made, it refused to assume jurisdiction in the case and transferred it to the appellate court of Illinois, first district, second division. In a memorandum decision, the appellate court affirmed the judgment of conviction.—*People v. Frankowsky* (Ill.), 13 N. E. (2) 178; 15 N. E. (2d) 894.

Medical Practice Acts: Chiropractic as the Practice of Medicine.—Three chiropractors were convicted of violating the medical practice act of Texas. They appealed to the court of criminal appeals, which in each case held that the complaint was sufficient and that the evidence justified the judgment of conviction.

In the Hoy case, the defendant was charged with maintaining an office where he offered to treat human beings for diseases and disorders; that he held himself out as capable of effecting a cure thereof without having first registered a license to practice medicine in the office of the clerk of the district court, as required by law, and that on a certain day he treated a named person for a disease and disorder and charged money therefor. At the trial, the patient named in the information

testified that he consulted the defendant relative to a physical or nervous ailment, that the defendant, after informing him that he had "misplacements of the vertebrae," gave him no medicine or performed no surgical operation but undertook manually to adjust his vertebrae, and that he paid the defendant \$50 for a series of such adjustments. It was further shown that Hoy had not registered any license in the office of the district clerk. The defendant complained that the trial court erred in refusing to sustain challenges for cause which he had interposed with respect to certain jurors who had served previously on juries which had convicted defendants charged with violating the medical practice act. If it had been shown to the trial court, said the appellate court, that the facts in the present case were the same as or similar to those adduced on the trial of the preceding cases, then the challenge for cause should have been sustained. In the absence of any such showing, the trial court correctly overruled the challenge, the challenged jurors having stated that their prior jury service would not affect their opinion or conclusion in the pending case, that they knew none of the facts in the case and that they were not prejudiced against the defendant.

In the Ehrke case, the evidence showed that the defendant maintained an office where he pursued his occupation as a chiropractor and that on a certain day he treated a named patient for nervousness for which he received compensation and that he had not registered a license in the office of the clerk of the district court. An indictment or information, said the court of criminal appeals, for practicing medicine without a license is sufficient if it substantially follows the language of the statute. Furthermore, it is well settled that chiropractors who make adjustments for compensation come within the purview of the medical practice act and must comply with the requirements of that act in order to be entitled to practice.

In the Lanford case, the defendant admitted that he had lived in Brownwood for six years and had been a chiropractor all that time. The evidence showed that he visited a named patient and gave him "a little adjustment and rubbed his jaw—and the back of his neck." The defendant admitted making the visit and that he received \$2 as a fee. This evidence was held sufficient to sustain the conviction.

Having found no error in the records, the judgments of conviction were affirmed.—*Hoy v. State (Texas)*, 115 S. W. (2d) 629; *Ehrke v. State (Texas)*, 115 S. W. (2d) 631; *Lanford v. State (Texas)*, 115 S. W. (2d) 632.

Workmen's Compensation Acts: Cecitis and Appendicitis Attributed to Trauma.—The deceased was a woman aged 19 who had apparently been in good health. On April 20, in the course of her employment, she slipped, it was claimed, from a stool on which she was standing and struck her right side against the sharp edge of a metal table. No one saw her fall, but within ten or fifteen minutes after the alleged injury she informed a fellow worker that she had been injured in the manner stated, and during that interval a Mr. Crowley saw her sitting on a stool with her hand pressed tightly against her right side. When she reached home shortly afterward her mother observed a swollen and bruised area on her right side. The published report does not make clear what her condition was between that time and May 9, on which day her appendix was removed. At the operation the cecum and the appendix were found inflamed, but there was no perforation. Peritonitis and pneumonia developed and death followed May 15. The claimant, the guardian of the minor child of the deceased, claimed compensation under the Michigan workmen's compensation act. The department of labor and industry awarded compensation. The employer and its insurance carrier appealed to the Supreme Court of Michigan.

Basing its finding solely on the testimony of the physician who performed the appendectomy, the department of labor and industry held in effect that the accidental injury complained of was the proximate cause of death in that it aggravated or produced the appendicitis and that the peritonitis and pneumonia that caused death resulted from the operation to remove the appendix. It would be difficult to determine, the physician had testified, whether the inflammation and infection of the cecum

and appendix were "due to injury or due to some other inflammation," but in his opinion the cecum became infected because the devitalization of the tissue by the trauma enabled infection to set in more easily. He testified further that the probabilities of the cecum becoming infected to the extent that it was from anything other than injury were very slight; that the infection spread from the cecum to the appendix because inflammation in the cecum tends to travel downward, and as the cecum is a blind pouch the "pus or infection" tends to accumulate there and pass on down into the appendix, and that the immediate cause of the death of the deceased was the peritonitis and pneumonia that resulted from the infection and inflammation. Under the circumstances, the Supreme Court could not agree with the contention of the employer and its insurer that the testimony of this physician was incompetent and inadmissible, because his conclusions were based on facts which were not supported by the evidence and because, while it was permissible for him to express an opinion, it was not permissible for him to give his conclusions. The court pointed out that, although the witness did announce his conclusions, he also expressed his opinion that the injury was the cause of the condition which he found.

The finding of the department of labor and industry, said the Supreme Court, that the deceased had sustained an accidental injury arising out of and in the course of her employment was supported by sufficient evidence. The testimony of her fellow worker as to what the deceased told her concerning the injury was admissible as a part of the res gestae and so came within an exception to the rule that hearsay evidence is inadmissible. Furthermore, the statement of the deceased as to her injury was substantiated by the testimony of her mother and of Mr. Crowley as to what they observed shortly after the injury.

The award in favor of the claimant was affirmed.—*Froman v. Banquet Barbecue, Inc. (Mich.)*, 278 N. W. 758.

Society Proceedings

COMING MEETINGS

American Medical Association, St. Louis, May 15-19. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

American Academy of Tuberculosis Physicians, St. Louis, May 13-14. Dr. Arnold Minnig, 638 Metropolitan Bldg., Denver, Secretary.

American Association for the Study of Goiter, Cincinnati, May 22-24. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.

American Association for Traumatic Surgery, Hot Springs, Va., May 8-9. Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.

American Association of Genito-Urinary Surgeons, Williamsburg, Va., May 24-26. Dr. Charles C. Higgins, 2050 East 93d St., Cleveland, Secretary.

American Association of Industrial Physicians and Surgeons, Cleveland, June 5-8. Dr. V. S. Cheney, Armour and Company, Union Stock Yards, Chicago, Secretary.

American Association of the History of Medicine, Atlantic City, N. J., April 30-May 1. Dr. Henry E. Sigerist, 1900 Monument St., Baltimore, Secretary.

American Association on Mental Deficiency, Chicago, May 3-6. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.

American Bronchoscopic Society, Rye, N. Y., May 26. Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.

American Dermatological Association, Montebello, Canada, May 31-June 3. Dr. Fred D. Weidman, University of Pennsylvania Medical Laboratories, Philadelphia, Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., May 1-2. Dr. Russell S. Boles, 1901 Walnut St., Philadelphia, Secretary.

American Gynecological Society, White Sulphur Springs, W. Va., May 22-24. Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.

American Heart Association, St. Louis, May 12-13. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.

American Laryngological Association, Rye, N. Y., May 24-26. Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.

American Laryngological, Rhinological and Otolological Society, Chicago, May 10-11. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Medico-Legal Association, Chicago, May 12-13. Dr. Michel Pijoan, 124 Commonwealth Ave., Boston, Secretary.

American Neurological Association, Atlantic City, N. J., June 5-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.

American Orthopedic Association, Buffalo, N. Y., June 5-8. Dr. Ralph K. Goss, 110 Second Ave. S.W., Rochester, Minn., Secretary.

American Society, New York, May 22-23. Dr. Thomas J. Gull, 40th St., New York, Secretary.

American Society, Sky Top, Pa., Apr. 27-29. Dr. Hugh Culloch, 325 North Euclid Ave., St. Louis, Secretary.

American Physiological Society, Toronto, Canada, Apr. 26-29. Dr. A. C. Ivy, 303 East Chicago Ave., Chicago, Secretary.

American Psychiatric Association, Chicago, May 8-12. Dr. Arthur H. Ruggles, Butler Hospital, Providence, R. I., Secretary.

American Radium Society, St. Louis, May 15-16. Dr. Frederick W. O'Brien, 465 Beacon St., Boston, Secretary.

American Rheumatism Association, St. Louis, May 15. Dr. Loring T. Swaim, 372 Marlborough St., Boston, Secretary.

American Society for Clinical Investigation, Atlantic City, N. J., May 1. Dr. Isaac Starr, University of Pennsylvania Hospital, Philadelphia, Secretary.

American Society for Experimental Pathology, Toronto, Canada, Apr. 26-29. Dr. Paul R. Cannon, Dept. of Pathology, University of Chicago, Chicago, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Toronto, Canada, Apr. 26-29. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.

American Society for the Study of Allergy, St. Louis, May 15-16. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.

American Society of Biological Chemists, Toronto, Canada, Apr. 26-27. Dr. C. G. King, Univ. of Pittsburgh, Dept. of Chemistry, Pittsburgh, Secretary.

American Society of Clinical Pathologists, St. Louis, May 12-14. Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.

American Surgical Association, Hot Springs, Va., May 11-13. Dr. Charles G. Mixer, 319 Longwood Ave., Boston, Secretary.

American Therapeutic Society, St. Louis, May 12-13. Dr. Joseph E. Elward, 1726 Eye St. N.W., Washington, D. C., Secretary.

American Urological Association, White Sulphur Springs, W. Va., May 29-June 1. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.

Arkansas Medical Society, Hot Springs National Park, May 8-10. Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.

Associated Anesthetists of the United States and Canada, St. Louis, May 15. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary General.

Association for the Study of Internal Secretions, St. Louis, May 13-14. Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.

Association of American Physicians, Atlantic City, N. J., May 2-3. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.

Association of Military Surgeons of the United States, Washington, D. C., May 8-10. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

California Medical Association, Del Monte, May 1-4. Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.

Connecticut State Medical Society, New Haven, May 25-26. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.

District of Columbia, Medical Society of the, Washington, April 23-25. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Executive Secretary.

Federation of American Societies for Experimental Biology, Toronto, Canada, Apr. 26-29. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.

Florida Medical Association, Daytona Beach, May 1-3. Dr. Shaler Richardson, 111 W. Adams St., Jacksonville, Secretary.

Georgia, Medical Association of, Atlanta, Apr. 25-28. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

Illinois State Medical Society, Rockford, May 2-4. Dr. H. M. Campbell, 224 S. Main St., Monmouth, Secretary.

Iowa State Medical Society, Des Moines, Apr. 25-27. Dr. Robert L. Parker, 3510 Sixth Ave., Des Moines, Secretary.

Kansas Medical Society, Topeka, May 1-4. Mr. C. G. Manns, 112 W. 6th St., Topeka, Executive Secretary.

Louisiana State Medical Society, Alexandria, Apr. 24-26. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 23-26. Dr. Walter Deat Wise, 1211 Cathedral St., Baltimore, Secretary.

Massachusetts Medical Society, Worcester, June 6-8. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.

Minnesota State Medical Association, Minneapolis, May 31-June 2. Dr. B. B. Souster, 11 West Summit Ave., St. Paul, Secretary.

Mississippi State Medical Association, Gulfport, May 9-11. Dr. T. M. Dyse, McWilliams Bldg., Clarksdale, Secretary.

National Gastroenterological Association, New York, June 1-2. Dr. G. Randolph Manning, 1819 Broadway, New York, Secretary.

Nebraska State Medical Association, Grand Island, May 2-4. Dr. R. E. Adams, 414 Federal Securities Bldg., Lincoln, Secretary.

New Hampshire Medical Society, Manchester, June 8-9. Dr. Carleton P. Metcalf, 5 South State St., Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, June 6-8. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.

New Mexico Medical Society, Gallup, May 11-13. Dr. L. B. Cochrane, 219 W. Central Ave., Albuquerque, Secretary.

New York, Medical Society of the State of, Syracuse, April 24-27. Dr. Peter Irving, 2 East 103d St., New York, Secretary.

New York State Association of Public Health Laboratories, Valhalla, May 8. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.

North Carolina, Medical Society of the State of, Cruise to Bermuda, May 9-14. Dr. T. W. M. Long, Roanoke Rapids, Secretary.

North Dakota State Medical Association, Fargo, May 8-10. Dr. Alfred W. Skelsey, 20½ North Broadway, Fargo, Secretary.

Ohio State Medical Association, Toledo, May 3-4. Mr. C. S. Nelson, 79 E. State St., Columbus, Executive Secretary.

Oklahoma State Medical Association, Oklahoma City, May 1-3. Dr. L. S. Willour, Third and Seminole, McAlester, Secretary.

Rhode Island Medical Society, Providence, June 7-8. Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary.

Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., Apr. 29. Dr. W. C. Spain, 116 E. 53d St., New York, Secretary.

Society of Surgeons of New Jersey, Elizabeth, May 31. Dr. Walter E. Mount, 21 Plymouth St., Montclair, Secretary.

South Dakota State Medical Association, Aberdeen, Apr. 24-26. Dr. Clarence E. Sherwood, Madison, Secretary.

Texas, State Medical Association of, San Antonio, May 8-11. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

17: 1-130 (Jan.) 1939

Cyanosis in Mitral Stenosis. P. Cossio and I. Berensky, Buenos Aires, Argentina.—p. 1.

*Coronary Artery Disease Analyzed Post Mortem, with Special Reference to Influence of Economic Status and Sex. W. H. Gordon, E. F. Bland and P. D. White, Boston.—p. 10.

*Isolation of Nicotine from Human Urine. O. M. Helmer, K. G. Kohlstaedt and I. H. Page, Indianapolis.—p. 15.

Tissue Pressure: Objective Method of Following Skin Changes in Scleroderma. W. A. Sodeman and G. E. Burch, New Orleans.—p. 21.

Postphlebotic Varicose Ulcer: Surgical Treatment, with Special Reference to the Communicating Veins of the Lower Leg. R. R. Linton and J. K. Keeley, Boston.—p. 27.

Intracranial Vascular Lesions. W. M. Craig, Rochester, Minn.—p. 40.

Effect of Mediastinal Lesions on Pressures in Antecubital and Femoral Veins: Report of Fifty-Two Cases. H. H. Hussey, Washington, D. C.—p. 57.

Bilateral Carotid Sinus Denervation in a Patient Having Syncope Attacks and a Congenital Vascular Anomaly: Report of Unusual Case. A. H. Elliot, N. T. Ussher and C. S. Stone, Santa Barbara, Calif.—p. 69.

Thrombophlebitis Migrans: Case Report. L. Hirschhorn, J. R. Lisa and R. J. Goldstein, New York.—p. 76.

Ventricular Extrasystoles Induced by Electrical Stimulation of the Exposed Human Heart Rotated 30 Degrees Counterclockwise on Its Vertical Axis. C. J. Lundy, I. Treiger and R. Davison, Chicago.—p. 85.

Study of Transverse Diameter of the Heart Silhouette with Prediction Table Based on the Teleoroentgenogram. H. E. Ungerleider and C. P. Clark, New York.—p. 92.

Coronary Artery Disease.—Gordon and his co-workers tried to determine the influence of the "economic status" on the general incidence and distribution of coronary artery disease. They examined the postmortem records of 600 economically well-to-do patients and for comparison 2,800 patients from the public wards of hospitals. The incidence and degree of significant coronary artery disease occurring in these two groups were determined. The public ward patients came largely from the low middle class of wage earners, many of whom were able to pay in part for their hospitalization. The data show that after the age of 70 years there is no difference in the incidence of coronary artery disease in men and women. Before that age there was much more in men than in women. The disproportion was most pronounced in young adults, the approximate ratio was three young men to one woman. This unequal incidence was evident in both coronary disease and complete occlusion. The relative incidence and the degree of coronary atherosclerosis were found to be significantly greater in the 600 private patients than in the 2,800 general ward patients. The greatest difference occurred in the middle-aged patients, in whom coronary occlusion was found to be twice as frequent in the private group. This difference was most striking in middle-aged men. These observations are in general agreement with clinical impressions.

Nicotine in Human Urine.—Helmer and his colleagues isolated nicotine, as crystalline oxalate and picrate, from the urine of persons who smoke. Its pharmacologic properties are the same as those of pure nicotine. They found that most of the nicotine disappears from the urine within three to four days after smoking is discontinued. Nicotine appears to be the substance responsible for the marked pressor action of many specimens of urine. Unless tobacco has been eliminated as a source of pressor substance in urine, conclusions relating urinary pressor substances to arterial disease are not justifiable. It has been suggested that nicotine might be retained by the body when there is a decrease in renal function.

Annals of Internal Medicine, Lancaster, Pa.

12: 907-1174 (Jan.) 1939

Experimental Heart Disease. G. E. Hall, Toronto.—p. 907.

*Pneumococcal Lobar Pneumonia: Report of 245 Cases, with Special Reference to Specific Serum Therapy. B. Horn, Bridgeport, Conn.—p. 922.

Urinary Diastase in Acute Pancreatic Necrosis: Experimental Investigation. C. J. Smyth, Ann Arbor, Mich.—p. 932.

Effect and Rate of Removal of Pyruvic Acid Administered to Normal Persons and to Patients With and Without "Vitamin B Deficiency." R. W. Wilkins, Soma Weiss and F. H. L. Taylor, Boston.—p. 938.

Acute Disseminated Lupus Erythematosus, a Systemic Disease. E. Rose and D. M. Pillsbury, Philadelphia.—p. 951.

The Aging Process: A Medical-Social Problem. G. M. Piersol and E. L. Bortz, Philadelphia.—p. 964.

*Clinical Study of Malignant Hypertension. I. H. Page, New York.—p. 978.

The Problem of Rheumatism and Arthritis: Review of American and English Literature for 1937 (Fifth Rheumatism Review). P. S. Hench, Rochester, Minn.; W. Bauer, Boston; M. H. Dawson, New York; F. Hall, Boston; W. P. Holbrook, Tucson, Ariz., and J. A. Key, St. Louis.—p. 1005.

Pneumococcal Lobar Pneumonia.—In two and a half years Horn states that 245 cases of lobar pneumonia were encountered. Of these 164 were of type I, II, V, VII, VIII or XIV pneumococcus pneumonia, for each of which specific serum is available. There were 104 type I cases, eighty-four of which were treated with serum, with a mortality of 3.6 per cent. This was in contrast to a 10 per cent fatality in the type I cases not treated with serum. Of thirty-three cases of types V, VII, VIII and XIV pneumonia treated with specific serum the mortality was 3 per cent compared to 12.5 per cent in the non-serum treated cases. Only three cases of type II pneumococcus pneumonia were observed. Serum was given, and prompt crisis occurred, with recovery. In the total of 120 serum treated cases the death rate was 3.3 per cent while in the 125 non-serum treated cases the mortality was 16.8 per cent. Serum sickness was observed in only twelve cases. Cutaneous and eye tests for sensitivity can reduce serious serum complications to a negligible minimum. From his experience the author believes that type I serum should be given as early as possible and in large amounts, no matter how late the patient is seen. Also all patients having pneumonia of the types for which therapeutic serum is available should be given the benefits of specific serum therapy.

Malignant Hypertension.—Page states that the diagnosis of malignant hypertension was made in thirty cases when the following morbid changes were observed: (1) hemorrhage and papilledema in the eyegrounds, (2) normal or moderately reduced renal efficiency (unless the disease was of relatively long duration), (3) rapid advance of the morbid changes, (4) elevated arterial pressure often with immoderately high diastolic pressure and (5) normal or slightly reduced plasma proteins and hemoglobin. Malignant hypertension appears to be a syndrome of varied origin. Both men and women suffer from it, men more often. It is a disease of early middle age but may occur in youth or late middle age, seldom in old age. As a rule, hypertensive-vascular disease in the family is not common. It is not unusual for these patients to have had scarlet fever. The chief complaints are headaches, visual disturbances and fatigue. Far less frequent are dyspnea, convulsions, fainting, weakness, precordial discomfort and edema of the ankles. As a rule striking contrast exists between the neurotic behavior of patients with essential hypertension and equable emotions of those with malignant hypertension. The kidneys produce few symptoms. Nausea and vomiting occur often. Severe loss of weight is common. The simultaneous occurrence of these symptoms and signs bode ill for the patient's life. Impressive both to patient and physician is the sudden occurrence of blindness in one eye due to hemorrhage. The results of physical examination usually convince one that the syndrome is rapidly progressive and bears little resemblance to the chronicity of essential hypertension. The heart may not have time to hypertrophy, but dilatation of marked degree is not unusual. Laboratory examination discloses that the heart is seriously injured. This is shown especially by inversion of the T waves in leads 1 and 2. The function of the kidneys may be only moderately impaired until within weeks or months of death, at least as measured by urea clearance or the maximal ability to concentrate urine. More than the normal number of erythrocytes

is found in the urine, indicating that the renal blood vessels have not escaped morbid changes. Hemoglobin in the blood is normal or moderately diminished in the early stages. During the terminal phase it may be sharply reduced. These changes resemble those of chronic nephritis rather than those of essential hypertension.

Annals of Surgery, Philadelphia

109: 161-320 (Feb.) 1939

- Variation in the Cholesterol, Bile Pigment and Calcium Salts Contents of Gallstones Formed in Gallbladder and in Bile Ducts with the Degree of Associated Obstruction. D. B. Phemister, H. G. Aronsohn and R. Pepinsky, Chicago.—p. 161.
- Further Evidence That Pancreatic Juice Reflux May Be Etiologic Factor in Gallbladder Disease. J. A. Wolfer, Chicago.—p. 187.
- Study of Results of Surgical Treatment of Peptic Ulcer. F. R. St. John, H. D. Harvey, J. A. Gius and E. N. Goodman, New York.—p. 193.
- Carcinoma of Peripapillary Portion of Duodenum. M. M. Lieber, Philadelphia; H. L. Stewart, Boston, and H. Lund, Uniontown, Pa.—p. 219.
- Neurofibrosarcoma of the Small Bowel: Report of Two Cases. A. J. Miller and L. W. Frank, Louisville, Ky.—p. 246.
- Dilatation of the Colon: Report of Case Following Development of Aortic Aneurysm; Relieved by Dilatation of Anal Sphincters. H. J. Shelley, New York.—p. 257.
- Celiac Ganglionectomy and Plexus Resection for Tabetic Gastric Crises. F. L. Pearl, San Francisco.—p. 263.
- Bilateral and Unilateral Renal Agenesis. H. M. Soloway, Chicago.—p. 267.
- Dermoid Cyst of the Bladder: Case Report. A. Lidzki, Wilno, Poland.—p. 274.
- Cysts of the Urachus: Report of Two Cases. H. I. Kantor, New York.—p. 277.
- Whole-Thickness Grafts in Correction of Contractures Due to Burn Scars: Three Case Reports. H. Conway, New York.—p. 286.
- *Pilonidal Sinus: Sacrococcygeal Ectodermal Cysts and Sinuses. M. Gage, New Orleans.—p. 291.
- *Gas Gangrene Following Therapeutic Injections. C. H. Harney, Philadelphia.—p. 304.
- Effect of Constant Gastric Suction on Acid-Base Equilibrium of the Body. J. M. Sullivan, Madison, Wis.—p. 309.

Pilonidal Sinus.—Gage divides pilonidal sinuses and cysts into four groups: (1) sacrococcygeal dimple and sacrococcygeal dimple sinus, (2) true pilonidal sinus confined to the subcutaneous tissue, (3) true pilonidal sinus extending into the sacral canal and (4) true pilonidal sinuses which are continuous with the subarachnoid space and canal of the spinal cord. He describes a method by which surgical excision and primary suture will give a high percentage of cures and a low incidence of recurrence. After the sinus tract has been defined and stained the operative procedure is as follows: With the patient in the prone position a pillow is placed beneath the pubes, and straps of adhesive tape are applied to the buttocks on either side and fastened to the table. The straps separate the buttocks and act as retractors. In the noninfected type an incision can be made directly into the sinus, the sinus easily dissected from the surrounding tissue with a minimal loss of tissue and the resulting wound closed by suture. However, in the majority of instances secondary sinuses are present and necessitate a more extensive dissection. An elliptic incision is made around the primary opening of the sinus and extends down to the periosteum over the sacrum or sacrococcygeal region. If necessary a probe is introduced from the mouth of the accessory sinus through the tract into the open wound, facilitating the dissection of the secondary sinus tracts. The wound is thoroughly inspected and remnants of the sinus tract are searched for and dissected. All bleeding points are ligated with fine silk and the wound is closed by retention sutures of silk or silkworm gut. After closure of the wound edges a dead space is present at the bottom of the wound. If this dead space is not obliterated a recurrence will take place. Complete apposition of all wound surfaces and obliteration of all dead spaces is secured by pressure over the wound. This pressure must be constant and distributed evenly and is obtained by the use of moistened sea sponges. This pressure dressing is left undisturbed for a period of from ten to twelve days. If it becomes necessary to change the dressing, the sponge pressure must be repeated. The author used the foregoing method in forty-two cases of pilonidal sinus, without a single recurrence. There have been nine cases of cutaneous infection with good healing and in one a deep infection which necessitated wound opening developed, but this healed by open granulation. Strug has used the same method in fifty-four cases, with primary healing of the wound in fifty-two. Streptococcal gangrene of the skin

developed in one case and serum accumulated in the wound in the other; this was aspirated three times before healing was completed. There have been no recurrences in his cases.

Gas Gangrene Following Therapeutic Injections.—A total of eighty-six cases of gas gangrene following the injection of medicaments have been reported, one of which is cited by Harney. Seventy-six of the eighty-six cases terminated in death. This figure is in marked contrast to the mortality of 49.7 per cent in 607 collected cases of gas gangrene following various injuries. The sites of injection were stated in fifty-nine of the reported cases and of these fifty-five were in one or both thighs, the buttocks or the abdominal wall. In nearly all cases reported, cultures were taken of the drugs, syringes, needles and solutions. A preparation of caffeine and digitoxin was found by Heuss to contain gas organisms. Nauwerck found gas bacilli in a preparation of caffeine sodium salicylate solution. Semenov and Anschutz were able to find gas bacilli in cultures from the needles used in their cases. Dimtz found gas bacilli in one syringe, one needle and four files of the type used in breaking glass ampules. In all other instances in which studies were carried out the drugs, solutions, syringes and needles were found to be sterile. The most frequent diseases from which the patients given the injections suffered were pneumonia, typhoid and malaria. In twenty-one cases clinical symptoms of gas gangrene appeared between ten and thirty-six hours following the contaminated injections. The time elapsing between the appearance of the clinical symptoms and death varied from one to seven days in forty-five cases. It is considered highly significant that fifty-five of fifty-nine contaminated injections were given into areas of the body surface which might easily be soiled by fecal material. For this reason these areas should be avoided when giving hypodermic or intramuscular injections. However, if they must be used the skin should be sterilized instead of receiving the perfunctory dab with a sponge which is customary in most hospitals.

Archives of Neurology and Psychiatry, Chicago

41: 223-434 (Feb.) 1939

- Variation in Vascularity and Oxidase Content in Different Regions of the Brain of the Cat. A. C. P. Campbell, Boston.—p. 223.
- *Studies in Mongolism: II. The Thyroid Gland. C. E. Benda, Wrentham, Mass.—p. 243.
- Cerebral Circulation: II. Reaction of Pial Arteries to Increase in Blood Pressure. M. Fog, Copenhagen, Denmark.—p. 260.
- Body Build in Schizophrenia, with Special Regard to Age. H. Gray and J. G. Ayres, San Francisco.—p. 269.
- Connections of the Pulvinar. J. W. Papez, Ithaca, N. Y.—p. 277.
- Syncope, Convulsions and the Unconscious State: Relation to Hyperactive Carotid Sinus Reflex. L. J. Robinson, Palmer, Mass.—p. 293.
- Progressive Confusional Syndrome Accompanying Injuries of the Cervical Portion of Spinal Cord. T. J. Putnam, Boston.—p. 298.
- Therapeutic Use of Curare and Erythroidine Hydrochloride for Spastic and Dystonic States. M. S. Burman, New York.—p. 307.
- Lymphomatoid Diseases Involving the Spinal Epidural Space: Pathologic and Therapeutic Consideration. J. Browder and J. A. de Vries, Brooklyn.—p. 328.
- Thomas Willis on Narcolepsy. W. G. Lennox, Boston.—p. 348.
- Sudden "Brain Death" in Schizophrenia with Extensive Lesions in Cerebral Cortex. N. Malamud and D. A. Boyd Jr., Ann Arbor, Mich.—p. 352.
- Hemiballismus: Clinicopathologic Study. F. P. Moersch and J. W. Kernohan, Rochester, Minn.—p. 365.
- Progressive Fall in Protein Content of Cerebrospinal Fluid Withdrawn Above a Tumor of the Cauda Equina: Diagnostic Aid. H. D. Fabrizio, Cincinnati.—p. 373.
- Ketonemia in Cases of Mental Disorders. J. W. Thompson and J. H. Aste-Salazar, Boston.—p. 375.

The Thyroid Gland in Mongolism.—Benda points out that facts seem to indicate that hyperthyroidism during the prenatal period is a cornerstone on which rests the explanation of mongolism. Pathologic study of the thyroid in fourteen cases of mongolism reveals that alterations are invariable. These consist in involutional changes: distention of acini, filled with colloid and composed of low epithelium; folding and overgrowth of epithelium in thick piles, like an adenomatous growth, without formation of new vesicles; changes in the form and shape of the epithelium; increase in stroma, and degeneration of glandular tissue. The changes seen in mongolism differ from those in myxedema and suggest a temporary stage of hyperfunction or dysfunction. It is not known whether the thyroid in mongoloid infants worked too effectively or too early. It is more probable that the condition results from other

influences which affected the embryo. There may be the influence of the maternal thyroid or some other stimulating factor resulting from unbalance of the maternal endocrine glands. There may be also stimulation through some other endocrine gland in the mongoloid organism itself. The microscopic appearance of the thyroid in mongolism reminds the author of the histologic changes seen in cases of pituitary disease.

Archives of Ophthalmology, Chicago

21: 211-408 (Feb.) 1939

- Central Angiospastic Retinopathy. S. R. Gifford and G. Marquardt, Chicago.—p. 211.
Cultivation of Trachomatous Conjunctival Epithelium in Vitro. P. Thygeson, with technical assistance of Nancy Roberts, New York.—p. 229.
Peculiarities of Well Known Ocular Diseases in the Netherland East Indies. A. W. M. Houwer, Batavia, Netherland East Indies.—p. 235.
Mixed Tumor of Lacrimal Gland. T. E. Sanders, St. Louis.—p. 239.
Evolution of Sucking Disk for Intracapsular Extraction of Cataract. T. J. Dimitry, New Orleans.—p. 261.
Dissociated Monocular Nystagmus with Paresis of Horizontal Ocular Movements. M. B. Bender and E. A. Weinstein, New York.—p. 266.
Pathologic Picture of Retinal Detachment: Survey. H. Samuels, New York.—p. 273.
Nutritional Cataract and Relation of Galactose to Appearance of Senile Suture Line in Rats. R. E. Eckardt and L. V. Johnson, Cleveland.—p. 315.
Automatic Trephine for Glaucoma. A. S. Green and M. I. Green, San Francisco.—p. 328.
Operative Procedure for Glaucoma of Shallow Chamber Type: Multiple Excisions of Root of Iris and Deepening of Anterior Chamber. O. Barkan, San Francisco.—p. 331.
Histologic Changes in Lens Produced by Galactose. S. R. Gifford and J. Bellows, Chicago.—p. 346.
Entity of Musclic Recession: Short Résumé of Its Technic and Principles with New Supplementary Notes and Illustrations. P. C. Jameson, Brooklyn.—p. 362.

Mixed Tumor of Lacrimal Gland.—Sanders discusses the records of twelve proved cases of mixed tumor of the lacrimal gland. Ten of the patients have been followed for more than two years. The presenting symptoms in the twelve cases were essentially those of a slowly growing orbital tumor. The most striking symptom was exophthalmos, for which the patient sought medical advice. In several instances this was first noted by persons other than the patient. Probably the most consistent diagnostic finding was the presence of a palpable mass in the region of the lacrimal gland under the outer half of the superior orbital brim. The earliest ocular complaint was transient, indefinite diplopia. As the mass increased in size this was accompanied by a limitation of movement. In six cases there was marked loss of vision below 3/60 when the patients were first seen, and two patients had moderate loss of vision. The vision of six was normal, but in these cases there was usually subsequent loss as the condition progressed. In the majority of cases the onset was insidious, with a slow but steady progression of symptoms. The patients complained of surprisingly little pain or discomfort. Several had an occasional dull ache in the orbit. The general health of practically all the patients was good. Of eleven cases in which surgical treatment was employed, there was recurrence in ten. One patient refused operation and died in six years with marked local invasion and metastases to the liver, lung and mediastinum. Four of the patients had metastases. Five are dead from intracranial extension due to a marked tendency for bony invasion. Microscopically the growths seem identical with mixed tumors of other locations. The invasive element seems to be the epithelium. The recurrence is probably due to incomplete removal. Pathologically the mixed tumors are probably a definite pathologic entity of dual origin, with the characteristic tendency of the epithelial element to become locally invasive. Irradiation is of little aid and early complete surgical removal is indicated. If there is evidence of bony invasion, a resection of the entire tumor-bearing area is indicated; but, if the invasive tumor is limited to the soft tissues, exenteration may be sufficient.

Arkansas Medical Society Journal, Fort Smith

35: 163-186 (Feb.) 1939

- Refraction. L. Gardner, Russellville.—p. 163.
Combined Use of Chemotherapy and Artificial Fever in Treatment of Neurosyphilis. F. M. Adams, Hot Springs National Park.—p. 166.
Pneumococcal Pneumonias and Type Specificity. F. E. Schmidt, Chicago.—p. 170.

Missouri State Medical Assn. Journal, St. Louis

36: 49-98 (Feb.) 1939

- The Eye in Congenital Syphilis. J. McLeod, Kansas City.—p. 49.
Early Eruptive Syphilis. T. B. Hall, Kansas City.—p. 53.
The Laboratory as a Guide to Diagnosis and Treatment of Syphilis. G. V. Stryker, St. Louis.—p. 54.
Manifestations of Late Syphilis. J. Grindon Jr., St. Louis.—p. 55.
Use of Fever Therapy in Treatment of Syphilis. A. J. Kotkis, St. Louis.—p. 57.
Syphilis of Bones and Joints. F. A. Jostes and M. B. Roche, St. Louis.—p. 61.
Effect of Therapy on Insulin Requirement in Diabetes. B. Y. Glassberg, St. Louis.—p. 69.
Some Recent Advances in Ophthalmology. C. S. Smith, Springfield.—p. 72.

New Jersey Medical Society Journal, Trenton

36: 69-134 (Feb.) 1939

- Recurrent Dislocation of the Shoulder. T. Nicola, Montclair.—p. 73.
Diagnosis and Treatment of Malignant Diseases of the Nose and Nasal Sinuses. L. A. Schall, Boston.—p. 78.
Progress in Ophthalmology. A. Rados, Newark.—p. 81.
Salicylate Poisoning: Report of Case. R. E. Jennings, East Orange.—p. 90.
Management of Missed Abortion: Maternal Welfare Article Number Thirty-Four. S. A. Cosgrove, Jersey City.—p. 92.

New York State Journal of Medicine, New York

39: 191-298 (Feb. 1) 1939

- Study of the Distribution of Physicians in New York State. J. S. Lawrence, Albany.—p. 199.
Forensic Neuropsychiatry. M. Keschner, New York.—p. 218.
Pneumonia in the Westchester County (New York) Health District, 1931-1935. E. A. Lane, White Plains.—p. 225.
The Responsibility of the Physician in Preventive Proctology. L. A. Buic, Rochester, Minn.—p. 232.
Prognosis of Insured Neurotics: Study of 1,000 Disability Insurance Claims. P. G. Denker, New York.—p. 238.
Heart Disease and Pregnancy. R. C. Tilghman, Baltimore.—p. 248.
Outline of Treatment for Syphilis: Methods and Technic Followed in Department of Dermatology of the Vanderbilt Clinic: Part III of a Series. A. B. Cannon, New York.—p. 254.

Prognosis of Insured Neurotic Persons.—Denker followed up 1,000 disability claims in which the diagnosis was psychoneurosis. These claimants were all insured and if totally disabled received varying amounts of money in monthly payments depending on the amount of insurance carried. The disability occurred from one to twenty years after the insurance policy was issued. The diagnosis in all instances was made by a physician and often corroborated by a nerve specialist. In the New York area most of the cases were examined by the author himself. Total disability was recognized only after the insured had been ill for at least three months and to an extent that would prevent him from engaging in any occupation for remuneration or profit. The milder or more transient neurotic disturbances are therefore automatically excluded from this study. The follow-up study was made at least five years and, in many cases, from ten to fifteen years after disability had commenced. The great risk of error in labeling a patient neurotic became apparent early in the study. It was found that 293 cases had been erroneously diagnosed "psychoneurosis," the true nature of the illness manifesting itself in most cases within one year as some organic disorder. The age at onset of the neurosis in the 707 true neurotic persons varied from 19 to 59 years, the average age being 37.2 years. This is in contrast to the slightly higher average age of the erroneously diagnosed group, in which 40.8 years was obtained. It appears that middle age in the male produces the greatest neuroses, possibly because his responsibilities are greatest and his career made or broken at this period. In the female this age incidence is somewhat lower. Of the 707 patients, 384 were men and 323 women. However, only from 12 to 14 per cent of the insurance policies during these years (1915 to 1930) were held by women. Neuroses were therefore from three to four times as frequent among insured women as among insured men, which corresponds with the clinical frequency of neurosis in women. No definite conclusions can be drawn as regards occupation, but there is a definitely high incidence of neurosis among clerical workers, executives, teachers and professional people in contrast to the greatly diminished number among manual workers and housewives. Only forty-five of the 707 truly neurotic patients gave a history of a familial mental taint. There were eighteen male

and four female deaths in the entire series, death being due to various causes. Approximately three fourths of the patients recovered within two years of the onset of their neurosis. A little less than half recovered within the first year. It seems that neurotic persons receiving \$200 or more per month, who have been ill for three years, practically never get well. The monthly disability check appears to eliminate the incentive to get out and fight life's struggles and, in addition, it acts as a constant reminder to the highly suggestible, mentally ill patient that he is disabled. It appears that it would be much wiser to pay these claims by some form of lump sum settlement at the end of the first year of disability or sooner.

Ohio State Medical Journal, Columbus

35: 121-240 (Feb.) 1939

- Interpretation of Clinical Chemical Procedures. J. H. Talbott, Boston.—p. 137.
- Recent Advances in Gynecology. P. K. Champion, Dayton.—p. 147.
- Angina Pectoris. J. T. Quirk, Piqua.—p. 151.
- Report of Case of Beta Hemolytic Streptococcus Meningitis Treated with Sulfanilamide. W. H. Falor, Akron.—p. 154.
- Arsine Poisoning: Report of Two Cases. K. D. Smith and T. E. Rardin, Columbus.—p. 157.
- Pancreatic Cysts: Report of Two Cases. R. M. Carmichael, Cincinnati.—p. 160.
- Newer Treatment Methods in Schizophrenia. E. A. Baber, Cincinnati.—p. 163.
- Symptoms and Physical Findings in Periphrical Arterial Disease. L. N. Atlas, Cleveland.—p. 169.
- Hypometabolism and Hypothyroidism. R. M. Watkins, Cleveland.—p. 171.
- Management of Chronic Urticaria. J. Forman, Columbus.—p. 175.

Surgery, Gynecology and Obstetrics, Chicago

68: 129-256 (Feb. 1) 1939

- *Aseptic Necrosis of Bone: I. Infarction of Bones in Caisson Disease Resulting in Encapsulated and Calcified Areas in Diaphyses and in Arthritis Deformans. S. C. Kahlstrom, Bath, N. Y.; C. C. Burton, Dayton, Ohio, and D. B. Phenister, Chicago.—p. 129.
- Early Diagnosis of Cervical Carcinoma. A. Wollner, New York.—p. 147.
- Early Phases of Prostatic Hyperplasia. C. L. Deming and C. Neumann, New Haven, Conn.—p. 155.
- Anatomy of Pelvic and Urogenital Diaphragms, in Relation to Urethrocele and Cystocele. A. H. Curtis, B. J. Anson and C. B. McVay, Chicago.—p. 161.
- Early Surgery in Biliary Disease. E. L. Eliason and J. P. North, Philadelphia.—p. 167.
- Obstetric Influences on the Weight Curve of the Newborn. W. C. C. Cole, Detroit.—p. 179.
- *Evaluation of Intradermal Test for Pregnancy. Susanne R. Parsons, Santa Barbara, Calif.—p. 187.
- *Role of Tuberculosis in Anal Fistula. L. A. Buie, N. D. Smith and R. J. Jackman, Rochester, Minn.—p. 191.
- Modified Schoemaker Gastrectomy for Chronic Gastric Ulcer. J. Morley, Manchester, England.—p. 197.
- Supracondylar Fracture of the Humerus: Analysis of 330 Cases. I. E. Siris, Brooklyn.—p. 201.
- Use of Metycaine for Producing Block Anesthesia of Sacral Nerves. E. B. Tuohy, Rochester, Minn.—p. 222.
- Management of the Third and Fourth Stages of Labor: Based on 11,000 Deliveries. M. Leff, New York.—p. 224.
- *Fat Necrosis—Granuloma of the Breast. S. F. Livingston and M. Lederer, Brooklyn.—p. 230.
- Improved, Radical Technique for Repair of Hydrocele Testis. M. Wolf, New Orleans.—p. 236.
- Follow-Up of Hernia Repair. A. B. Longacre, New York.—p. 238.

Aseptic Necrosis of Bone.—Kahlstrom and his co-workers report the results of a clinical and roentgenologic study of four cases of caisson disease with extensive changes in the skeleton. One case came to necropsy and in another a biopsy was performed on the involved head of the femur. Extensive lesions were revealed in diaphyses and in epiphyses of certain bones with changes in the joints. The evidence appears to be conclusive that the primary lesion is an accumulation of nitrogen gas in the bones—intravascular or extravascular—with circulatory interference and a resultant massive aseptic necrosis. In the head of the femur or humerus the necrotic lesions may break down and be invaded and eventually replaced by new bone or fibrous tissue. Invasion of portions of the epiphysis may be followed by calcification and arrested transformation, especially in portions of the epiphysis away from the articular surface. Involvement of the articular cortex and cartilage leads to the slow development of arthritis deformans with or without osteo-cartilaginous loose bodies. The lesions in the shafts are much more numerous and extensive than in any reported case of

blond infarction or aseptic necrosis of bone. The necrosis was of the interior of the diaphysis in all instances. It is difficult to state whether the lesions in the bones produced by the nitrogen gas were the result of nitrogen embolism or of nitrogen accumulation within the medullary cavity and direct compression of blood vessels and other tissues or a combination of the two. Lesions of the soft parts are known to be produced by both methods. Points in favor of nitrogen embolism are that (1) the lesions were frequent (in three cases) in the heads of femurs in which the end arteries are known to be found frequently and (2) the metaphyses of the lower end of the femur and of the upper end of the fibula and both ends of the tibia were affected in some cases while their epiphyses escaped, which would favor embolism of the branches of their nutrient arteries. Points against the embolic theory are (1) the enormous size and symmetrical distribution of the necrotic areas and (2) absence of involvement of the bones of the trunk. In favor of the local pressure on blood vessels and other tissues of nitrogen gas accumulated in the medullary cavities is the limitation of the process to the bones of the extremities. These bones are rich in fatty marrow, while the bones of the trunk which have higher temperatures than the bones of the extremities (Huggins and Blockson) contain hematopoietic marrow. Since fats and lipoids are known to absorb approximately five times as much nitrogen as other tissues, more nitrogen should be liberated within the bones of the extremities than within the bones of the trunk in caisson disease. The best treatment of any form of necrosing lesion of the head of the femur (including caisson disease necrosis) is prolonged abstinence from weight bearing, thus permitting reorganization of the necrotic area, and if possible replacement by new bone with the avoidance of collapse of the head.

Intradermal Test for Pregnancy.—Parsons found that the intradermal test, according to the results obtained in 100 pregnant women and forty postpartum or known nonpregnant women, gives an unreliable test for pregnancy, since it was inaccurate in both the control group and in the known pregnant group with an error of from 4 to 72 per cent. In the early months of pregnancy, error of as high as 72 per cent was obtained. Age, menstruation, days post partum and duration of pregnancy had little influence on the readings. Follutein was found to react more often both in the pregnant and nonpregnant groups, owing perhaps to a protein reaction rather than to the gonadotropic hormone present. Difficulty was experienced in making the readings, as pigmentation of the skin and degrees of erythema were influencing factors which often left in doubt the classification into which the test should fall. From a review of the 679 cases in which the intradermal skin test was performed, the test has proved entirely unreliable in the hands of the workers who have attempted to repeat the work of Gilfillen and Gregg. There seems to be no choice among the various hormone preparations used; all yield equally unreliable results.

Tuberculosis in Anal Fistula.—In order to clarify, if possible, the controversy regarding tuberculosis as a cause of anal fistula, Buie and his colleagues studied 206 consecutive cases of anal fistula. Guinea pigs that received subcutaneous injections and those that received intraperitoneal injections of tissue from eleven patients died within three weeks. This low percentage of failures can probably be accounted for by the fact that a method of attenuation of the colon bacillus was employed. More deaths occurred before this time limit expired in the cases of those guinea pigs injected intraperitoneally than occurred after the time limit. Of the 195 cases (94.7 per cent) studied successfully and completely, tuberculosis was not found in 163 cases. In thirty-two cases, evidence of the presence of tuberculosis was found somewhere in the body. Of this group of thirty-two cases, ten gave evidence of a tuberculous "focus"; that is, seven showed healed or inactive pulmonary tuberculosis, two an active pulmonary lesion and one tuberculosis of the cervical lymph nodes. Inoculation of animals, routine histologic studies and subsequent study of numerous sections of tissue did not reveal evidence of tuberculosis in the anorectal fistula. Inoculation of animals gave positive results in twenty-two cases, whereas routine microscopic study of sections from an adjacent piece of fistulous tissue gave positive results in only eight cases. These results approach closely those of other

investigators who have used the same method of studying sections of a similar nature. Of the twenty-two patients who were proved to have a tuberculous fistula, seventeen were shown to have, in addition, a so-called focus of tuberculosis elsewhere in the body. In one of the remaining five cases the organism was demonstrated in sections of tissue taken from the fistula. In the twenty-two cases in which positive results were obtained, the average time required for healing was seventy-three days as compared with an average of twenty-nine days in the 173 cases of nontuberculous fistula. Whether a fistula is tuberculous or not should not alter the type of treatment employed.

Fat Necrosis of Breast.—Livingston and Lederer present two cases of fat necrosis of the breast. The first case is particularly instructive because, although it fulfilled all clinical criteria for a diagnosis of a malignant growth, it proved to be a benign lesion. The diagnosis made preoperatively was carcinoma and a radical amputation was performed. In the second case a correct preoperative diagnosis was made and only the lesion was removed. If one was to speculate regarding the cycle of evolution of fat necrosis, it can be said that first either there is trauma from external causes or direct pressure of the breasts from their own weight. If the trauma is severe with injury to blood vessels, one may see areas of ecchymosis. If the trauma extends more deeply there may be no visible evidence of blood extravasation. The presence of pigment in cells suggests that there has been hemorrhage. There is a fat splitting ferment (lipase) in the blood as well as in the fat itself. Fat tissue, being unstable, breaks down easily into its constituents, fatty acids and glycerin. Fat necrosis and fat splitting are two different processes frequently allied, necrosis being the principal event and fat splitting only an accompaniment. The necrosis of fat tissue accompanied by a splitting into fatty acids and glycerin is considered to be a degenerative phase which is closely followed by repair. This repair is characterized by the appearance of spindle, round and giant cells (Menville). Since the majority of fat necrosis is subcutaneous, the fibrous repair tissue acts like strong cords which have no elasticity but have a tendency to retract. Adair states that, early in the cycle of fat necrosis, small cysts may form. After several years these cystic cavities may contain a mixture of small and large calcareous masses. If these tumors are left undisturbed, the contents and wall of the cyst solidify into a calcareous mass. Fat necrosis more closely resembles carcinoma than other benign lesions. The treatment is local excision of the tumorous mass.

United States Naval Med. Bulletin, Washington, D. C.

37: 1-212 (Jan.) 1939. Partial Index

- Surgical Shock. H. K. Gray and L. R. Chauncey.—p. 1.
Recent Advances in Endocrinology: Résumé. O. J. Brown.—p. 22.
Recent Advances in the Knowledge of the Vitamins. W. W. Hall.—p. 46.
Sulfanilamide and Chemotherapy: Supplementary Report. R. A. Bell.—p. 73.
Gonorrhea Treated with Sulfanilamide. M. S. Mathis and P. J. McNamara.—p. 114.
Sulfanilamide in Treatment of Gonorrhea Aboard Ship. C. A. Yonng and J. H. Ward Jr.—p. 129.
*Immune Transfusions in Lymphogranuloma Inguinale. J. P. Brady.—p. 131.
Treatment of Scabies. G. E. Thomas.—p. 137.
Electric Welding, Particularly Eye Hazards and Protective Measures. T. J. Carter.—p. 138.
Time Study of Morbidity and Mortality in the United States Navy. J. M. Wheelis Jr.—p. 142.
The New Policy of Training Naval Flight Surgeons. J. C. Adams.—p. 150.

Immune Transfusions in Venereal Lymphogranuloma.

—Brady points out that of sixteen patients with venereal lymphogranuloma given transfusions from immune donors (having had the disease and recovered from it not less than ten weeks before) all showed distinct clinical improvement in mental attitude, color, appetite and definite increase in weight. The disease may be one in which immunity is acquired with formation of immune bodies in the blood stream. The author believes that immune transfusion as a therapeutic agent is worthy of further investigation in this condition and to verify his results. The possibilities of the blood bank are widened if the foregoing results are verified. The naval service offers an excellent opportunity for this study both because of the prevalence of the disease and because of the number of donors obtainable.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 97-146 (Jan. 21) 1939

- Thoracotomy: Conservative and Selective Operation for the Treatment of Certain Cases of Pulmonary Tuberculosis. L. O'Shaughnessy and G. Mason.—p. 97.
Critical Review of Extrapleural Pneumothorax. R. Nissen.—p. 100.
Anesthesia in Thoracic Surgery. J. T. Hunter.—p. 102.
*Inguinal Lymph Gland Biopsy in Diagnosis of Tuberculous Disease of Knee. H. J. Seddon.—p. 105.
Electro-Encephalogram in a Case of Pathologic Sleep Due to Hypothalamic Tumor. W. G. Walter, G. M. Griffiths and S. Nevin.—p. 107.
"Sodium Thio-Ethamyl" (Sodium Iso-Amylethylthiobarbiturate). C. L. Hewer.—p. 109.

Inguinal Lymph Gland Biopsy in Tuberculosis of Knee.—Two and a half years ago it was suggested to Seddon (by Fitzgerald) that examination of an inguinal lymph gland on the affected side of a joint suspected of tuberculous infection might give valuable information. For removal of the gland local anesthesia is employed, except in small children. The operation is a biopsy and nothing more. The results in the diagnosis of eighteen cases of tuberculous disease of the knee are given. In a few of these cases inguinal biopsy was not required to establish the diagnosis; since material from the knee was available, however, the author felt justified in removing glands from these patients in order to establish the reliability of the method. There were only three negative results in the series. A positive result is of the greatest possible value, but a negative one cannot be taken to exclude tuberculous disease of the joint. To ensure himself that a positive result could not possibly be fortuitous the author removed glands from other regions in four cases, in none of which was there any evidence of tuberculous disease. Since gland biopsy is a worthwhile procedure, the next step is to apply it in doubtful cases of arthritis of other joints. The merit of the method is its simplicity and safety.

Glasgow Medical Journal

13: 1-56 (Jan.) 1939

- Benign Lymphocytic Meningitis. D. A. Cannon.—p. 1.
*Survey of Results of Fractures of Long Bones of the Lower Limb. A. M. Murray.—p. 9.

Fractures of the Lower Limb.—Murray gives the results with fractures of the femur obtained from 1926 to 1935 and of the tibia and fibula from 1932 to 1936 inclusive. Only those cases about which detailed information was available are included in the tabulation of the results. Many of the older patients have died subsequently as the result of other illnesses. Considerable numbers, chiefly of male patients, have been lost sight of owing to the recent migration to England of workers in heavy industries, which in itself presupposes a satisfactory result. The total number of fractures of the femur in males more than 15 years of age was seventy-six. Of these twenty-nine were fractures of the neck of the femur and forty-seven were fractures of the shaft. Nine patients died in the hospital. There were seventy-seven fractures of the femur in females more than 15 years of age. Fifty-four were fractures of the neck and twenty-three were fractures of the shaft of the femur. Eight deaths occurred in the hospital. The total number of fractures of the femur in children up to 15 years of age was seventy-seven, all of which were fractures of the shaft. There were three deaths. There were 214 fractures of the bones of the lower leg: ninety-six in males and fifty-three in females more than 15 years of age and sixty-five in children less than 15 years of age. Only seven deaths occurred in the hospital in this group of patients. Apart from those with immediately fatal results, no patients were subsequently unfit for any occupation. Primary amputation was necessitated owing to damage to the soft tissues and vessels in only two cases. Quite a number of the patients had had both legs broken at the same or different times. When one leg had been operated on and the other treated conservatively the patient maintained that the leg on which the operation was performed was less easily fatigued than the other one. In no case in which operative measures were adopted did nonunion of the bone follow. Since the introduction of stainless steel there has been less reaction in the tissues than formerly. Sepsis following operative treatment of a compound fracture occurred in a few instances but always cleared up quickly leaving no permanent ill

effects. Good results (provided that reduction is efficient) seem to depend to a large extent on (1) the amount of damage to the soft tissue rather than purely bony damage and (2) the patient himself, particularly when he has reached the ambulant stage and is no longer in need of hospitalization. After-treatment appears to be as much a social as a medical problem. The financial aspect is of primary consideration in many cases. Perhaps some arrangement could be made whereby the ambulant patients would be sent out to camps and encouraged to do all sorts of odd jobs and to play games in a modified way until they were fit to return to work. Should they be unfit for their original employment, the onus of finding other work should fall on the former employer. In this way, although the patient would not benefit financially, his incentive to complete recovery would be greater and there would be less scope for the malingerer.

Irish Journal of Medical Science, Dublin

No. 156: 741-788 (Dec.) 1938

- Recent Advances in the Surgical Treatment of Pulmonary Tuberculosis. F. J. Henry.—p. 741.
Treatment of Tuberculous Cavities. B. O'Brien.—p. 748.
Leuko-Erythroblastic Anemia: Reports on Three Cases. J. McGrailh.—p. 755.
Cardiazol Treatment of Dementia Praecox. H. Bewley.—p. 762.
Geniculate Herpes: Cases. H. L. Parker.—p. 766.
Polycystic Disease of the Liver. T. E. Bradshaw.—p. 768.

Medical Journal of Australia, Sydney

1: 1-48 (Jan. 7) 1939

- The Case for Individual Isolation: Its Use in Infectious Diseases and in the Care of Infants. H. J. Sinn.—p. 4.
*Note on a Series of Laboratory Infections with the Rickettsia of Q Fever. F. M. Burnet and M. Freeman.—p. 11.
*Further Series of Laboratory Infections with the Rickettsia of Q Fever. D. J. W. Smith, H. E. Brown and E. H. Derrick.—p. 13.
Rickettsia Burneti: Cause of Q Fever. E. H. Derrick.—p. 14.
Theories of Shock and Their Relation to Burns. J. B. Devine.—p. 14.

Infections with Rickettsia of Q Fever.—Burnet and Freeman describe a series of mild or subclinical laboratory infections with Q fever. The infections were recognized by serologic tests—rickettsial agglutination and protection tests in mice. A mite, *Lyponyssus bacoti* Hirst, is suspected of being the responsible vector from experimentally infected mice. The mode of infection has not been definitely determined. Since two of the five laboratory workers infected have never worked with the organism, and one of them has been entirely engaged in clerical work, it is strongly suspected that the infection was carried by some freely moving arthropod vector. Mice have been used as laboratory animals in practically all the work on Q fever, and the human infections must have arisen eventually from these. Two ectoparasites are present in the authors' stock of mice; the common mouse louse, *Polyplax serrata*, is almost always to be found in small numbers and the blood-sucking mite *Lyponyssus bacoti* Hirst has appeared at times in large numbers. At other times the stock appears to be free from this parasite. Circumstantial evidence points strongly toward the mite, which moves freely and is known to bite human beings, as the responsible vector; but no experimental evidence of its capacity to transmit infection has been obtained.

Q Fever in Laboratory Workers.—Smith and his associates cite two cases of laboratory infection with Q fever. In each case the Q virus was found in the patient's blood by guinea pig inoculation, and Q agglutinins were demonstrated in the serum during convalescence. The infections were associated with mouse experimentation. While the mite *Liponyssus bursa* (Berlese) was present at times on the mice and was therefore a potential vector, the authors ascribe the infections to direct contact with infective mouse tissues.

Practitioner, London

142: 1-136 (Jan.) 1939

- The Importance of Diet and General Treatment in Dermatology. H. W. Barber.—p. 1.
Psychologic Factors in Skin Diseases. C. H. Rogerson.—p. 17.
Significance and Treatment of Itching. W. N. Goldsmith.—p. 36.
Pyogenic Infections of the Skin. G. H. Percival.—p. 55.
Diagnosis and Treatment of Common New Growths of the Skin. S. Thomson.—p. 67.
The Modern Treatment of Eczema. F. F. Hellier.—p. 80.
Alopecia. J. E. M. Wigley.—p. 89.
Fear. J. R. Rees.—p. 99.
First Aid in Air Raids. C. H. Carlton.—p. 107.
Diet in Health and Disease. XIX. General Principles of Diet in Childhood. B. Rivet.—p. 115.

Presse Médicale, Paris

47: 177-200 (Feb. 4) 1939. Partial Index

- *Complex Mechanism of Edema in Patients with Heart Disease. Z. Doumer.—p. 183.

Mechanism of Edema in Heart Disease.—Doumer says that the edemas of patients with cardiac disorders are generally attributed to purely mechanical factors. Cardiac insufficiency causes disturbances in the peripheral circulation, which in turn leads to stasis and to venous hypertension. The latter causes excess pressure in the capillary network and, under the influence of this excessive hydrostatic pressure, serous transudation and edema develop. This explains certain edemas of cardiac origin but it does not seem to explain all of them. The edemas seem to be of a more complex nature in patients with aortic defects, with hypertension, with coronary lesions and in those with cardiac insufficiency with normal heart and presenting the aspects of left-sided ventricular insufficiency. It is known that left-sided ventricular insufficiency does not produce peripheral edemas or at least it does not produce them until the secondary insufficiency of the right side of the heart has developed. The edemas which complicate the syndrome of insufficiency of the left ventricle are not hard and they pit readily. Moreover, they are not cyanotic but pale like those of patients with renal disease. The author further discusses the hydropigenous factors of a humoral or tissular type, then the noncardiac edemas of patients with heart disease and finally the cardiac insufficiency that is of edematous origin. He reaches the conclusion that the edemas of patients with heart disease are mechanical edemas only in certain cases and to a certain extent. In the development of edematous infiltration there enter multiple factors, some of which are probably only indirect consequences of the progressive cardiopathy. As long as these factors are incompletely understood it is impossible to draw practical conclusions. Once they have been penetrated, however, it will doubtless be possible to face the problem of the treatment of the edemas as well as of certain conditions of heart failure if it is confirmed that certain hydropigenous conditions may exercise secondarily a harmful action on the function of the myocardium.

Sang, Paris

13: 113-224 (No. 2) 1939

- Anemia in Patients with Bright's Disease. M. Loeper and P. Perreza.—p. 113.
Diagnostic Significance of Plasmocytic Tendency in Infectious Mononucleosis. R. Waitz.—p. 131.
*Clinical Value of Coaguloretractovisometry in Internal Diseases. L. Blacher.—p. 140.

Coaguloretractovisometry in Internal Diseases.—Blacher says that he has employed his own method of coaguloretractovisometry on the blood of 147 patients. Describing this method in a previous report, he differentiates between "the reaction of coagulability" (coagulation of the upper layer of the blood) and "the reaction of coagulation" (coagulation of the lower portion of the blood). Moreover, he distinguishes between the "time of the reaction of coagulability" (the time elapsed from the mixture with the reagent to the moment of appearance of coagulation) and the "time of the reaction of coagulation" (interval required for the coagulation of the remaining blood). In the present report he finds that the variations of the coagulability of the blood, which are ascertained in diverse internal diseases, are typical for each particular disorder. Not only are the quantity, quality and amplitude of the deviations of the evolution of the coagulability characteristic for the more or less grave forms of the hemorrhagic conditions, but they reveal the nature of the pathogenic agent and the length of time it has been active. In morbid states there are observable modifications not only of the reactions of coagulability but also of the structure of the clots. According to their physical properties, the clots can be classed as hard, soft, liquid and "sanguinolent." The marbling of the clotted blood, which the author observed most frequently in cases of hemorrhagic disturbances of the hepatosplenic system, indicates the absence of the reaction of retractility in the clotted blood. The variations in the course of the coagulability of the blood in the hypochromic anemias indicate either impending hemorrhage or occult bleeding. In pernicious anemia, liver treatment exerts

a perceptible action on the retractility of the coagulated blood, particularly the retractive force of the clot. The oscillations of the phase of coagulability do not depend on the evolution of the reaction of retractility and on its force; on the contrary, the retractive force of the coagulum depends most often on the evolution of the reaction of retractility of the clotted blood. The peculiarity of the detected traits in the coagulability in the course of diverse diseases procures for each of these diseases a new pathognomonic symptom, which may be helpful both in the diagnosis and in the prognosis. The variations in the coagulability of the blood are directly related to the condition of the liver and of the spleen. The spleen exerts an inhibiting effect on the course of the coagulation and especially on the reaction of the retractility of the clot. The liver is the principal producer of the substances that are necessary for the process of coagulability, whereas the spleen regulates the process. The variations of the course of the reactions of the coagulability of the blood are concomitant to the corresponding oscillations in all the corpuscular system of the peripheral blood. The strongest modifications of this phenomenon have been revealed in the course of a thrombopenia with a thrombocytic formula "deviation to the right" without acrochromatic or achromatic platelets.

Anales del Inst. Modelo de Clin. Médica, Buenos Aires

18: 1-688 (No. 1) 1937. Partial Index

Alteration of Esophageal Mucosa and Its Folds from Roentgen Point of View. R. S. Abad.—p. 248.

*Perforated Cholecystitis: Anatomoclinical Variations. J. A. Caciro.—p. 638.

Perforated Cholecystitis.—Caciro reports six cases of perforation of the gallbladder in the course of calculous cholecystitis. He found that the condition is due to necrosis of the walls of the structure. The clinical and anatomopathologic forms of perforation depend on the type, either acute or benign, of the infection by which the evolution of perforation is controlled and also on the presence or absence of peritoneal adhesions. He observed that acute perforation takes place in gallbladders which contain fluid at great pressure or calculi obstructing the cystic duct. Perforation takes place at the point of greatest pressure or where the calculi are impacted. The gallbladder is not inflamed, although the walls are thickened. There are no adhesions from the structure. Perforation of slow evolution takes place in calculous cholecystitis of long duration. The gallbladders are filled with calculi and there are many adhesions through which the structure is joined with one or several visceral organs. Perforation takes place at the point of greatest pressure of the calculi or at the point of union of the gallbladder with adhesions. Perforation at the lower aspect of the gallbladder is frequently complicated by the formation of fistulas between the gallbladder and the colon and duodenum. That at the upper aspect of the structure is frequently complicated by fistula of the liver. In either case the gallbladder empties its contents into the organ with which it joins, through the fistula. Perforation of the liver is complicated by grave abscess of the liver and degeneration of the liver parenchyma. When perforation is at the lower aspect of the gallbladder there is a history of the patient with grave repeated infection, frequently with jaundice, inflammation or tumors at the subhepatic region, a grave peritoneal reaction and symptoms simulating gastric or duodenal ulcers. When it is at the upper aspect of the gallbladder, pain in the liver and acute hepatitis are the predominant symptoms. An early diagnosis is of importance. The treatment consists of cholecystectomy, at the end of which an ample drainage is left.

Archivos de Pediatria del Uruguay, Montevideo

10: 1-72 (Jan.) 1939. Partial Index

Bacteriology of Nontuberculous Diseases of the Lungs in Children. G. Elkeles.—p. 20.

*Meningo-Encephalitic Complications of Typhoid in Children. E. Peluffo and C. E. Castells.—p. 35.

Meningo-Encephalitic Complications of Typhoid in Children.—According to Peluffo and Castells, typhoid bacteria have a special affinity for the nervous system, especially in children. The most frequent complications of typhoid in

children are those involving the meninges or the brain with development of a special type of encephalitis. The acuteness of the complications vary in different cases. Meningitis is more frequent and less grave than the encephalitic complications. It may develop at any time in the course of typhoid. Sometimes the meningeal reactions are the predominant symptoms of typhoid, and again grave suppurative meningitis may develop. The encephalitic complications may cause bulbar, cerebellar ataxic, mesencephalitic, choreic, cortical aphasic, mental and epileptic symptoms. The prognosis of the complications, especially encephalitis, is grave. Until recently symptomatic treatment was resorted to, but satisfactory results have now been reported in the literature in cases of typhoid encephalitis from a treatment with immunotransfusion. The authors report four cases in children between the ages of 3 and 4 years. In none of the patients was immunotransfusion resorted to. Three patients died. The one who recovered has mental sequelae.

Zeitschrift für Krebsforschung, Berlin

48: 169-282 (Dec. 17) 1938. Partial Index

Neoplasm of Mammary-like Structure in External Gastric Layers of Rabbit After Prolonged Treatment with Estrogen. Hannah Pierson.—p. 177.

Behavior of Lipoids of Implantation Tumors in Organism of Host. A. Lang and A. Rosenbohm.—p. 183.

*Regeneration of Skin of Mice After Preliminary Treatment with Cancerigenic Substances. Doris Dietrich.—p. 187.

Experiments with Heterotransplantation of Tumor Tissues. H. W. Schmidt.—p. 223.

Photochemistry of Antilytic Factor in Cancer. B. Bugyi.—p. 227.

Primary Tumors of Epididymis. B. Falconer.—p. 243.

Skin After Treatment with Cancerigenic Substances.

—In this paper Dietrich reports studies on the part played by regeneration in the pathogenesis of experimental cancer. It was her aim to find answers to the following problems: 1. How does regeneration take place in skin that has been treated with cancerigenic substances? 2. Is it possible to produce cancer earlier in this manner than is possible merely by chemical irritation? 3. Is this production of malignancy due to a latent cancerigenic characteristic of the epithelium which becomes manifest as the result of the stimulus of regeneration, or is an action of the cancer producing substance on the general organism responsible for this special course of regeneration? The author made studies on sixty-six mice which had been treated with cancerigenic substances (tar and benzpyrene). After various periods of time, pieces of skin were removed from the site that had been painted with cancerigenic substances and from another site (posterior portion of the back). The pieces were sectioned and subjected to microscopic examination. The wounds were left open following the excision and after twelve days of regeneration another excision was made at the same sites and these pieces too were examined microscopically. It was found that, depending on the length of painting with the cancerigenic substance, the skin showed thickening of the epidermis with desquamation, formation of cones, papillomas or atypical proliferations. The pieces excised from the unpainted sites never showed changes in the epidermis; that is, they were identical with those from mice that had not been painted with cancerigenic substances. Thus the untreated pieces of skin gave no indication that the painting with cancerigenic substances had caused a general alteration in the organism. In two cases the regeneration on the untreated site showed more pronounced conical formations than is normally the case, but it would be going too far to conclude from this that painting of a site with cancerigenic substances causes general changes in the organism. The site that had been painted with cancerigenic substances showed considerable deviations of regeneration. During a certain stage of the painting with cancerigenic substances the added regeneration stimulates the as yet unchanged epithelium to an increase in layers, to greater cone formation and partly even to proliferation with atypical transformation. It may be said that by the addition of regeneration the epithelium is transformed from a precancerous into a cancerous condition. However, it appears that the proliferating epithelium or the one that has already undergone cancerous degeneration may show normal regeneration. The innate drive of the cell toward

regeneration with the aim of bridging a defect is not changed or inhibited by painting with cancerigenic substances. To be sure, the time required is usually somewhat longer than normal. In the final estimation of these studies in which the author also cites a report by Brunschwig, Tschetter and Bissel on "Wound Healing and Neoplasia," she says that her microscopic studies did throw some light on this relationship between regeneration and cancerigenic action. Her studies indicate that the tendency to proliferation is accelerated by regeneration and that the regeneration is the eliciting factor for proliferation, if an anlage to it existed previously.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

79: 1-64 (Jan. 3) 1939

*Clinical Investigations in Connection with Beriberi: Significance of Edema in Beriberi. F. M. Meyers.—p. 3.

Vitamin C Content of Fruits in the Dutch East Indies. J. P. Spruyt.—p. 17.

Method of Examination in Treatment of Malaria. J. Kuipers.—p. 24.

Noteworthy Case of Snake Bite Poisoning. W. M. G. Helfferich.—p. 40.

Edema in Beriberi.—A deficiency in vitamin B₁ (aneurin) appears under two distinct clinical syndromes: (1) as a simple polyneuritis and (2) as a complex syndrome with polyneuritis, edema and a disturbance in the function of the heart and blood vessels. Studies by Meyers were made to determine the significance of the edema in beriberi. In most cases of simple polyneuritis the appearance of the nervous lesions is preceded by other, usually infectious, processes. This is not the case in beriberi. Moreover, the polyneuritides do not seem to be early forms of beriberi and the transformation of polyneuritis into beriberi seems to be the exception rather than the rule. On the basis of purely anamnestic information it was not possible to discover any difference in the dietetic insufficiency of the two types of patients. Heart disease is also absent in about half of the cases of polyneuritis without edema, and heart disease is present in 92 per cent of the cases of polyneuritis with edema. Yet it is hardly possible to consider the edema in beriberi as only of cardiac origin. The vascular syndrome after an injection of epinephrine which is typical for beriberi (Aalsmeer) is absent in the majority of cases of polyneuritis, and Volhard's diuresis test has a normal course in these cases. Volhard's test may have the same result in beriberi, in which the edema is of a pronounced transient character. These transient edemas represent probably the simplest and purest picture of the edema of beriberi. They are of a hydrostatic nature and seem to be caused by a lowering of the tonus of the arteriolar walls and by an increased tension in the capillary system. The epinephrine blood pressure curve (Aalsmeer) which is typical for beriberi seems to be a manifestation of this. The question why edema exists only in some of the cases of deficiency in vitamin B₁ thus leads to the inquiry after the causes of the circulatory failure. This question has not been answered as yet, but since treatment with aneurin cures the edema as well as the nervous lesions it seems probable that the first has an intrinsic rather than an extrinsic origin.

Norsk Magasin for Lægevidenskapen, Oslo

99: 1289-1384 (Dec.) 1938

Otogenic Encephalitis. T. Leegaard.—p. 1294.

Vitamin B₁ Therapy in Delirium Tremens. J. Kloster.—p. 1301.

*Acute Terminal Ileitis. H. F. Harbitz.—p. 1305.

Spontaneous Rupture of Aorta with Dissecting Aneurysm in Boy Aged 14½. K. Harstad.—p. 1311.

Binasal Hemianopia with Tumor in Posterior Fossa. A. Torkildsen.—p. 1317.

Case of Late Rupture of Ligament of Extensor Pollicis Longus after Fracture of Radius. N. Clemetsen.—p. 1322.

Case of Abdominal Abscess with Unusual Etiology (Salmonella?). O. Hartmann.—p. 1329.

Pyloric Stenosis in Gastritis. C. Schultz.—p. 1333.

*Symptomatology of Mitral Stenosis. O. Jervell and G. Grytting.—p. 1337.

Sulfanilamide in Malaria. W. Loenneken Jr.—p. 1353.

Investigation on Acidity Relation in Chronic Peptic Ulcer Before and After Ulcer Treatment. Ruth Ramberg.—p. 1358.

Acute Terminal Ileitis.—Harbitz reports two cases of acute terminal ileitis in youths aged 15 and 19 respectively. It was characterized by subacute onset, abdominal pain for from eight to ten days and then aggravation with severe pain in the right

iliac fossa. On rectal exploration there was tenderness on the right side. There was a marked red thickening of the distal end of the ileum in one case; in the other, palpation of the intestine showed a leathery thickening like that in linitis plastica, but glandular enlargement dominated the picture, in the first case with one gland the size of a walnut and another the size of a pigeon's egg, in the second case with a hard glandular tumor about the size of a hen's egg. Acute terminal ileitis, the author says, may be considered as a distinct entity. Clinically it usually appears as an acute or subacute appendicitis. Although the affected portion of the ileum can hardly be palpated, the pronounced enlargement of the glands should be noticed. The disease occurs most often in the first two decades of life. Treatment should as a rule be exploratory laparotomy and appendectomy. The appendix is usually of fairly normal appearance and a relationship to the inflammation in the ileum is doubtful. The author expects certain roentgenographic changes in the lower part of the ileum seen in his cases some months after the laparotomy in the acute stage, probably as a result of the earlier acute ileitis, to disappear gradually, but continued observation is called for. He wishes to stimulate after-examination in cases of conservatively treated acute terminal ileitis. He adds that chronic terminal ileitis occurs most often in the third and fourth decades of life, usually with the symptoms of a chronic enteritis, and may resemble an ulcerous colitis; chronic diarrhea is most often the first symptom. Infiltrations develop in the lower ileum, with ulcerations, abscesses and perforations. The affected intestinal portion gradually becomes narrowed and a true ileus may occur. In addition to palpation, x-ray examination is of decisive significance. Treatment often consists of the employment of laparotomy with drainage, with later entero-anastomoses and finally resection.

Mitral Stenosis.—Jervell and Grytting studied 169 cases of mitral stenosis (in forty-four men, 125 women) observed during the last five years. In eighty-two (twenty-nine men, fifty-three women) there was history of one or more attacks of rheumatic fever. Fifty-nine (ten men, forty-nine women) had no history of diseases to be connected causatively with the valvular defect; these cases, predominating in women, are thought possibly to depend on a disposition in women to rheumatic infections without clinical symptoms. The rheumatic fever in most cases occurred between the ages of 10 and 20. Most of the patients were between 20 and 40 years of age, forty-four were over 50 and three over 70. The duration in the fourteen patients who died, aged from 24 to 65, was from two to twenty-eight years. Eighty patients had palpitations, which in nineteen were the first symptom. Fifty-eight reported pain in the heart region, fourteen of these typical angina pectoris; in five this symptom led to the diagnosis. When asystolia sets in, dyspnea dominates the picture; 134 had dyspnea during rest or on exertion, and in 121 it was the first symptom. The authors say that mitral stenosis in the first stage may be difficult to diagnose. A presystolic or diastolic murmur is the characteristic auscultatory observation. The diastolic murmur may be loud or soft, short or long continued. A systolic murmur was established in 118 of the 169 cases, clear diastolic murmur in 115, presystolic murmur in thirty and gallop rhythm in twenty-four. In six cases there was no certain murmur and in seven only a systolic murmur. X-ray examination is of great value in the diagnosis of mitral stenosis, electrocardiographic examination being less important. There is distention of the pulmonary artery, right ventricle and left auricle, and signs of pulmonary stasis are often present. "Mitral configuration" appeared in fifty-five cases (73.9 per cent), enlargement of the heart in fifty-four cases (71.1 per cent) and both "mitral configuration" and enlargement in 52.6 per cent. Compensatory hypertrophy of the heart can be anatomically established; dilatation is believed to occur first, and the enlargement of the heart established on x-ray examination is regarded as a dilatation. There was arrhythmia in 102 patients and hypertonia in nineteen, with permanent hypertension of more than 200 in only three. Mitral stenosis is not seldom combined with other valvular defects. If early diagnosis of mitral stenosis is made and the patient's manner of living regulated early, the asystolic stage may be avoided or at all events delayed.

THE STUDENT SECTION

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The Legal Status of the Intern

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In the last quarter century twenty-one states and Alaska have made the hospital service a requirement for licensure. Some medical schools withhold the degree until one year at least has been served. In 1938 the Council on Medical Education and Hospitals reported for the United States 7,354 internships in 729 approved hospitals and for Canada forty-eight approved hospitals. In addition, clinical clerkships in teaching hospitals, where men have varying types of duties, furnish an opportunity for the student to become familiar with the service in advance of formal appointment. A change has been noted in the place of the intern in the educational scheme. Whereas in the past the service in the hospital was considered postgraduate training and optional with the student, longer training as a resident is now required and the intern is regarded more as an undergraduate, still pursuing his medical course, learning the art as well as the science of medicine. Longer periods of intern service are offered and consequently the assumption of more responsibility for adequate care of the hospital patient. With increased responsibility has come the necessity for wider knowledge, more maturity of judgment and better poise.

When the intern enters the hospital, he learns for the first time in his life that he is liable for his acts not only as an individual member of society but as a professional man. Besides, once the medical student comes in intimate contact with patients he is amenable to the statute governing the practice of medicine in his state. For the first time his every word and every act are scrutinized, often remembered and frequently misunderstood by a person rendered hypercritical by illness. The intern by a thoughtless remark alone can cause a malpractice suit for the physician referring the patient. Observations concerning previous diagnosis and treat-

ment are particularly dangerous, because the patient rarely understands and never correctly describes any medical opinion or procedure.

COSTLY MISTAKES

With improvement in the technic of diagnosis and treatment and the consequent increase in mechanical manipulations, the opportunities for costly mistakes are enormously increased. A broken spinal puncture needle, the silkworm-gut suture left in the abdominal wall, the wrong solution injected into a body cavity, an infection following a trifling operation may cause the intern untold trouble with possibly the loss of reputation in the locality, the loss of money and indirectly great damage to the prestige of the hospital. Thoughtful men in all departments of medicine are disturbed at the way in which litigation is increasing, the ease with which it can be started, the complicated, costly, and to physicians the cumbersome methods of the law. They are astounded at the ease with which the slightest slip in technic is magnified when presented to a jury of laymen, and the difficulty of getting the truth to prevail. The hospital may protect its property and its employees; the visiting staff can rely on the insurance company to assume liability. Apparently the intern, if attacked as an individual, is without protection. One insurance company in New England, with long experience in this field, offers no way in which the intern may be covered. Another company specializing in liability insurance replies: "Our Hospital Policy covers the liability of a hospital on account of the negligent acts of interns, resident physicians, and medical students. It will not, however, cover the liability of resident physicians, interns or medical students themselves." Insurance companies demand a certain competence, experience, medical society membership and the good opinion of men of the same standing. House officers cannot yet meet these standards. Besides, it appears that if a liability contract were devised the high cost would be a deterrent to many

young men still under expense of education. Until the legal status of the intern is determined by precedents or, better, by statute the hospital can scarcely afford to insure him.

The hospital has a selfish interest in protecting the intern from himself for its own salvation. One can but feel that too often the intern is given too much latitude in the conduct of ward service. No one believes today that an internship prepares any man to become a safe, conservative surgeon. And that often appears to be the aim of the student himself. Some of the dissatisfaction existing in unnecessary and harmful operative work done in private practice springs from the practice of permitting the house surgeon to do by himself operations for which he is not trained.

Many hospitals with a small resident staff require many routine administrative duties and the assumption of altogether too much responsibility in the performance of technical procedures. Hospital administrators complain that the intern is poorly prepared to do his job. But, as Dr. Lueius R. Wilson says, "The intern is suddenly transported from the environment of the medical school he knows so well and finds himself in a new hospital constructed and operated along different lines from the one he knew as a student. The hospital routines are different, its rules and regulations developed from years of experience with its particular problems are hard to understand. The staff have names with which he is unacquainted, he knows little, if anything, of their contribution to medicine; the hospital routines following different channels from those strongly entrenched in his mind."

As has been pointed out by more than one hospital executive, not only is the intern entitled to the conventional precedent book of routine matters but he should be introduced to his new duties by some one who will be a sympathetic adviser, who can interpret to the newcomer methods and customs of that hospital, in which otherwise he may grope and stumble during his whole appointment.

HOSPITALS ARE COMPLEX ORGANISMS

He should be taught that hospitals are complicated organisms, serving in a most personal manner the public made up of all types of individuals, dealing with persons sensitized by illness, with relatives and friends even more demanding and more critical. The opportunities for trouble in the hospital exist in every procedure, every minute of the day, and involve every employee and officer and every physical feature of the plant.

The intern is charged with the duty of carrying out the instructions of the attending physician except in emergency. When an emergency arises it is incumbent on the intern to

exercise his own judgment until report can be made to the attending physician.

The intern may be charged with failure to obtain consent for an operation from a husband or the parent of a minor. Care must be used that state laws are observed. Permission should be reviewed by the superintendent's office. He is liable for malpractice in the case of a minor, to the majority of the patient and whatever the statute of limitations may be beyond that; in one state to the age of 23.

In obtaining permission for necropsy the intern must get the signature of the right person, preference being given to the relative who assumes control of the body, bearing in mind that a minor cannot grant permission, though he is the sole survivor. One must be certain that the person granting permission clearly understands the nature of the necropsy and that the scope is definitely established, as well as understood and followed by the pathologist. Where the coroner system prevails one must be careful in doing autopsies on the orders of that officer. Limitations of his power exist and outraged relatives may cause difficulty. Every city has regulations as to what constitutes medicolegal or "medical examiners'" cases, including abortions, prisoners, wounds and deaths from criminal violence. Failure to report such may be serious for the hospital.

The house officer is amenable to the law and held for his acts in privileged communications in the same way as physicians in private practice. He is forbidden to communicate with patients for the purpose of engaging the services of attorneys.¹ He is forbidden to report deaths to or recommend particular undertakers. He may be summoned to court with hospital records and compelled to testify to facts. Interns must respond to subpoena, but hospitals may and sometimes do refuse to disclose the names of members of the house staff who have treated patients involved in lawsuits, because much time is lost in attending court. The New York law is so comprehensive that the intern had best avoid all relations with attorneys except as the superintendent of the institution directs.

An intern at a charity hospital referred accident cases which he had solicited to two attorneys. Although he denied an agreement, he fully expected to be paid. He was advised to plead guilty to the charge and was sentenced to three months in the penitentiary (297 N. Y. S. 103²). He is subject to the national and state income tax laws. The superintendent of the hospital returns to the tax authority each year the list of employees having a minimum income, with board and living, if furnished, computed at approximately \$500 a year.³

1. Hayt and Hayt: Legal Aspects of Hospital Practice, New York, 1938, p. 86.

2. Cited by Hayt and Hayt.¹

3. Hayt and Hayt: Legal Aspects of Hospital Practice, p. 15.

Many hospitals are getting a larger number of personal injury, street accident and compensation cases than ever before. Larger numbers of citizens come within the categories covered by various types of protection. The intern will treat many more of these cases in a short service than the private physician. The hospital should therefore have a clearly defined routine for his guidance, since the payment of the hospital bill and the patient's chances of financial recovery depend so much on prompt and proper reporting.

INTERNS' COUNCILS

The national Wagner act and the little Wagner acts of the states bring the place of the intern as an employee to the serious consideration of hospital authorities. Interns' councils, formed for scientific purposes for the maintenance of standards, should not be the cells for labor agitation. Demands for higher salaries have disturbed thoughtful physicians interested in fostering the spirit of true hippocratic medicine and loyalty to the ideals of the past. Criticism has been heard of breaking of contracts by interns without much consideration for the hospital.

It is unfortunate that social legislation compels the hospital to place the intern in the category of employees. "An employee is one whose duties consist in the rendition of prescribed services and not the accomplishment of specific objects, and whose services are continuous, not occasional or temporary."⁴

For compensation purposes the intern is covered by the law governing employees. Interns and nurses in a hospital maintained by municipal or other political units are also within the compensation law coverage. In a case of voluntary insurance by a charitable trust an intern is also held to be an employee.¹ An intern in the Cook County Hospital contracted epidemic meningitis and died. An award to his widow by the arbitrator was set aside by the industrial commission but it was affirmed by the circuit court and by the Supreme Court of Illinois. "A distinction is drawn between the position of a visiting or consulting physician and that of an intern, who has placed his time and service at the call of a superior. The intern is under a duty to spend his days and nights at the hospital, and to render any service, administrative or medical, exacted by the hospital through its administrative agents, within the range prescribed by propriety and custom. He is a servant or employee by every test of permanence of duty, intimacy of contact, and fulness of subjection."⁵ When the Social Security Act is extended to include hospitals, the house officer will doubtless be included in its coverage.

LIMITS OF RESPONSIBILITY

No general doctrine exists fixing the limits of responsibility of different types of hospitals and the different classes of persons attached to the hospitals. Court decisions vary from state to state. House officers, along with pathologists and roentgenologists as well as private physicians and special duty nurses, are classed as nonadministrative employees. The general rule is that the hospital is not liable for their negligence. Administrative employees, all those attached to the superintendent's office, for instance, form the other group. Responsibility for their conduct may rest on the hospital, a knotty problem which the courts have considered for years.

The policy of today seems based on the acceptance of the fact that the hospital is not liable for the negligence of its doctors and nurses in any matter included in the patient's "medical care and attention." In some cases in which an operation is performed the intern, as well as the nurses, has been held to be the delegate of the surgeon, to whose orders he is subject. This includes the preparation for the operation. In the alleged performance of an operation without the consent of the patient, this was the opinion of the court. The fact that the house physician acts under the orders of his superior, who is a licensed practitioner, does not relieve him of responsibility. "The surgeon who performs an operation is not responsible for the acts of his assistants and nurses unless they are his own employees." So, the house surgeon who works with him cannot look to the chief for protection.

The doctrine is widely accepted that a hospital is not responsible for the acts of its visiting staff. The hospital undertakes to provide for the patient the services of its house staff. It does not promise to perform these services itself. The charitable hospital is relieved from responsibility for the acts of its employees provided it has not been negligent in its choice of employees. On the other hand, ". . . a hospital conducted for private gain is liable in damages to patients for injuries resulting from negligence of the nurses and employees. A patient is admitted to a hospital conducted for private gain under either an express or implied obligation that he receive such reasonable care and attention for his safety as his mental and physical condition, if known, may require" (*Meridan Sanatorium v. Scruggs*, 83 So. 532).

Under Wisconsin law a charitable hospital is to be regarded as exempt from liability to a patient for the negligence of its chief administrative officer in selecting employees who are either incompetent or negligent and also for the negligence of such employees in administering to the needs of the patient (*Morrison v. Henke*, 165 Wisconsin 166, 160 N. W. 173).

4. Commissioner of Internal Revenue, act of 1928, quoted by Supreme Court of Massachusetts in *Mallory v. White*, 8 F. Supp. 989.

5. Hayt and Hayt: *Legal Aspects of Hospital Practice*, p. 178.

Though the private hospital has been held responsible for the negligence or tortious acts of its employees, nurses, house staff, the charitable hospital, since the case of *MacDonald v. Massachusetts General Hospital* (120 Mass. 432) of 1876 has been, practically throughout the country, freed of this responsibility unless negligence in the employment of its servants was shown; but in *Glavin v. Rhode Island Hospital* (12 R. I. 411), in which the patient brought suit for the alleged malpractice of an intern, the court rejected this doctrine. "Where there is a duty, there is prima facie, at least, liability for its neglect, that when a corporation . . . is created for certain purposes which cannot be exercised without the exercise of care and skill, it becomes the duty of the corporation . . . to exercise such care and skill, and the fact that it acts gratuitously . . . will not exempt it from liability for any neglect of duty . . ." It is understood that the legislature of Rhode Island saw fit to exempt the hospital from liability. But the intern whose alleged malpractice was the basis of the suit is still open to attack.

Ever since 1846, when the theory of absolute immunity of the charitable institution resting on its "trust funds" was enunciated, down to the present time many court decisions have been handed down. Other states have accepted decisions of the New York State courts in large part. Confusion has resulted largely because there has been no movement by those most interested to clarify matters by legislative enactment.

"Instability of economic conditions, especially within the last ten years, has greatly altered and visibly changed the mental reactions of the average individual within our community. Particularly in the larger population centers the older, confidential and trusted relationship between the physician and his patient has given way to habits of medical shopping. There has been an increasing tendency to seek legal redress through malpractice claims. This has affected both the medical practitioner and the hospitals. The rise of more universal use of insurance for health, for accident liability and compensation, has also disturbed the management of hospitals to no small degree. It has stimulated greed in certain groups of individuals and has resulted in attempts to abuse both medical and hospital facilities through sharp practice. The hospital's stand must at all times be one of equity and this is often rendered difficult."

Relief of illness, teaching and research comprise the functions of the hospital. Devotion to these has kept trustees, administrators and staff from adopting the methods of big business. They have not been active in legislation. When disputes arise, specific charges of negligence end

in another court decision. The definition of the basic rights, duties and obligations of the patient, the hospital house staff and visiting staff are not defined by statute law. And it would appear that the majority of hospitals are exempted from liability for the acts of its interns, and the visiting staff members may not be responsible. The great danger is that the intern may be the most exposed of all those attached to the hospital.

INTERNS AND LICENSURE

The physician is, quite properly, completely absorbed in healing the sick and, if he is fortunate, doing his bit in improving the practice of medicine. He is interested in practical methods for helping the underprivileged. He is loyal to his patients and they apparently are to him. He is rarely interested in legislation or politics. When he receives a communication from a lawyer making a claim against him the doctor stands aghast. He cannot believe that any patient can be responsible for this, to him, outrageous attack. The practice of the courts is a dread and a mystery; they hold no allure for him. On the other hand, accustomed to direct action, he feels that their methods are cumbersome, wasteful and inefficient.

No uniform policy for limited licensure or exemption of interns from provisions of the law exists in the various state enactments. Thirty-six states practically ignore the medical student and the intern. Sixteen states have statutory provision, most of them being exceptions to the application of the medical practice act. In a few states the intern and/or the medical student is affirmatively permitted to practice medicine in a hospital under the guidance of teachers. Apparently, Massachusetts alone grants "limited registration" for the definite period of his internship (section 9A ch. 112) on completion of three and one-half years of medical study in approved schools. The state also grants a limited license to (section 9A ch. 112) "assistants in medicine who are under supervision of an instructor," students who have completed at least two years in medical school. Limitations are placed on the activities of such students, and the hospital and the other institutions to which they are attached under the direction of staff members. For the period of his limited registration the intern is permitted to sign birth and death certificates.

New Hampshire permits "resident physicians" to practice in any legally incorporated hospital. This is not wholly satisfactory, since no report of appointment is required of the "resident" or the hospital. Supervision cannot be exercised by the board of registration. Physicians ineligible for registration may become, for an indefinite period, whole time members of the staff of such institutions as the state tuberculosis

sanatorium or the hospital for mental diseases without compliance with the medical act. A lenient attitude is shown interns apparently by boards of registration out of consideration for the financial position of these young men, many of whom do not intend to locate in the state. All of them are known to be under the supervision of mature staff members, who with the hospital are presumed to be responsible for the conduct of house officers.

But should the intern as an unlicensed physician be charged with malpractice he is indeed vulnerable and his defense is handicapped. The attorney for the plaintiff emphasizes the illegality of his action. In addition to the charge of professional misconduct he is charged with crime. In some instances in which the hospital has been freed from the charge of negligence the intern himself has been charged with the same offense. In those states where the internship service is demanded for licensure the decision of a Wisconsin court is pertinent:

It cannot be said that the performance of the duties with which it was alleged the defendants were charged were duties that it would have been lawful for them to perform. The law recognizes that a hospital internship of at least twelve months is required before a license to practice medicine may be granted. Although under the law no person may practice medicine, or hold himself out as authorized to practice medicine, without first securing the required license or certificate, yet the law itself requires an internship as a part of one's medical education before one can be licensed to practice. This is a legal sanction of the performance of such duties on the part of interns as are usually and ordinarily performed by them. The performance of such duties does not constitute the practice of medicine or a representation that the intern is authorized to practice medicine.⁷

A widely quoted decision of the New York Court of Appeals (*Hendrickson v. Hodkin et al.*, 276 N. Y. 252, 11 N. E. [2 D] 899) sets a precedent for possible court decisions making a hospital liable for the practice of any person not licensed by the state authorities.

MALPRACTICE

Malpractice is a distasteful subject. But it is an important subject, and if the experience of the recent past is to be that of the future it will demand more consideration. Hospitals with their trustees, staff, nurses and employees as well as private practitioners are all involved. No hospital is immune to the charge and there is no person concerned with medical care of patients in the hospital who is not liable to attack. House officers have been made defendants in actions for malpractice to the point that serious consideration should be given to means for their protection. A recent case, involving assault because of lack of a state certificate, and

malpractice as well, required the united efforts of counsel for the hospital and attorneys for the state medical society to free the accused.

Nearly all suits for alleged malpractice end in a verdict for the defendant, but the effects of inevitable publicity faced by the house officer, the sense of unjust persecution can but injure the morale of any young man, whose career may be terminated then and there. Practically never is lack of knowledge the basis of complaint. Those interested in this subject feel that malpractice claims are increasing. Certainly suits against hospitals are common enough. Modern social philosophy demands security for the individual without his own responsibility for himself. The facility with which insurance can be purchased for almost every contingency, the widespread knowledge that almost everybody is insured, leads to unusual demands for satisfaction by the injured. It is no longer possible for the injured to be the cause of his own accident, and the law of contributory negligence has nearly ceased to operate.

It is a fact that some hospitals are understaffed, and interns, some routine administrative work being essential, may be hurried or become careless or, because of fatigue, make the fatal slip in technic or the thoughtless remark that leads to trouble. Sufficient oversight by the staff and relief from some routine will prevent such errors. To the ward patient the intern is the patient's doctor, coming closer, by far, to the man or woman than the chief visiting surgeon. We cannot forget that.

It may be argued that the chances for malpractice suits involving the intern are rare. But the slight yet perceptible increase in this sort of litigation, and the eagerness of attorneys for business, do not increase the safety of the intern. Such cases, like many others taken on a contingent fee basis, possess a nuisance value at least. Some settlement, however small, must be made, or one must face the alternative of expensive litigation. Attention should be directed to the evolution of some scheme for protection of the intern from attack.

CONCLUSION

From this study one may conclude that the exact status of the intern has not been established. To his medical school he may be a student or an alumnus, to the hospital an officer or an employee or an independent contractor (private opinion of attorney), to the state a student or a physician either licensed or unlicensed. With the change in our concept of the internship as an essential part of the education of the physician with gradual standardization of the state requirements for the practice of medicine, with the increasing emphasis on longer hospital training, the status of the entire house staff should be definitely established.

7. Medicolegal Cases: Abstracts of Court Decisions of Medico-legal Interest 1931-1935, Chicago, American Medical Association, 1936, p. 257.

The house officer should have the protection of the law and certainly the moral protection of the hospital and organized medicine. State boards of registration should either demand registration before internship or grant exemption from the requirements of the medical practice act. Suits for malpractice having a serious effect on the future of these young men should be prevented. It is a matter of concern for us all.

The contribution of the members of the Federation of State Medical Boards might well be, where it is lacking, a legalizing of the position of the intern, for the protection of the man himself and the hospital he serves. The grant of a temporary certificate as provided in the Massachusetts law would remove much of his handicap.

Brown House.

Comments and Reviews

CONCERNING INTERNS AND INTERNSHIPS

Abridgment of an article by Reginald Fitz, Wade Professor of Medicine, Boston University School of Medicine, and published in the Journal of the Association of American Medical Colleges, March 1939.

There regularly develops in medical schools at the end of the third year, or early in the fourth year, an epidemic of worry over internships. This seems a pity, because the clinical work should not be interrupted by extraneous factors.

From two successive surveys of the Massachusetts interns and internships, it is apparent that our internships are regarded as useful and that our interns, in general, are promising young men. The better students select our better teaching hospitals in which to be trained; on the whole, the better the internship offered, the better is the scholastic record of the intern who is accepted; the weaker hospitals which offer the poorest training attract the poorest students.

Not all of the best scholars in the Boston schools care to remain in Massachusetts for their internships; in fact, some of our best students prefer to go to other parts of the country for intern training. To make up for their loss, we attract graduates from other schools. On the whole, this also is satisfactory. The men from outside schools, as a general rule, are acceptable and stimulating scholars, so that to have them wish to come to Massachusetts is a feather in our cap.

A situation has arisen, however, which is not so pleasant. Hospitals naturally wish to attract to themselves the best possible interns they can get, and to do this they appear to vie with one another in making their appointments at earlier dates than do their competitors.

For many years the Boston teaching hospitals have held examinations for interns on or about January first. A number of hospitals outside Boston were written to for information concerning the date at which their 1939 appointments will be made to include candidates who will not graduate until June. Twenty-three hospitals have replied to this letter. Each of these

hospitals can safely be guaranteed to any student as offering as good an internship as is obtainable in the United States. In most instances they represent teaching hospitals in various parts of the country which are in the habit of drawing away from Massachusetts fourth year student material of the highest caliber. These hospitals make their appointments as early as November (two hospitals), early in December (five hospitals), and mostly during the Christmas holidays, a time which appears to be convenient for personal interviews between hospital and applicant to take place.

Thirty-nine hospitals in New England approved for intern training, but not strictly allied with medical schools, also replied to the letter. In this group the answers were particularly interesting. One hospital is so forehanded as to make intern appointments in July for men who will not graduate until the following June. Another makes its appointments in September, one in October, one in November, many in December, and only a comparative handful after the first of the year. One excellent hospital wrote, very honestly, "In years past we have always made our appointments on or about February 15, but from our experience of the past year we found that many of the applicants for our internships canceled their applications and some even canceled their appointments which they have received because they had accepted appointments in hospitals elsewhere. It is our feeling that we should make our appointments this year not later than January 1. We wish that there might be some way that the intern committees serving the various hospitals could come to a definite understanding as to the date of appointment for interns."

COMPETITION FOR INTERNS

Medical schools in other parts of the country wish that such ardent competition for interns as now exists could be done away with and that intern committees serving the various hospitals could come to a definite understanding as to a uniform date of appointment for interns.

Nor is the problem a new one. Thirty years ago a representative hospital, such as the Massachusetts General Hospital, held its examination for interns in the early spring. Little by little, however, as the importance of internships was universally acknowledged and as the competition for interns grew keener, the date of examination for the Massachusetts General Hospital was pushed back closer to the beginning of the fourth year in order to keep in step with what other hospitals were doing. This method of approach to the situation was not effectual. All that happened was that other hospitals pushed their examinations even further ahead.

Finally, medical students themselves began to complain of what was happening. In 1937 Victor Richards, a junior in the Stanford University School of Medicine, published an interesting paper entitled "The Internship," giving an undergraduate's point of view on the matter.

Nearly a year ago the third year classes of the Harvard Medical School and of Tufts Medical College wrote letters to the Boston Committee suggesting, in effect, that it would be highly desirable from these students' point of view if some arrangement could be established by which intern appointments could be made in various hospitals at about the same time, thus to "avoid the complications and duplications heretofore experienced."

Thus, it is apparent that medical schools, hospitals and students all dislike the present confusion and feeling of competition regarding intern appointments. Some sort of a reform is badly needed.

DESIRABILITY OF A REASONABLE TIME SCHEDULE

As to what can be done and how to do it is more difficult to say. Boston has made efforts, sporadically, to have its examinations for interns in the teaching hospitals come at the same time as do the examinations for interns in other teaching centers. This effort has never met with any wholehearted support, chiefly because each hospital is apt to desire a personal interview with prospective interns and it is practically impossible to work out a reasonable time schedule that will suit every one. The Intern Placement Bureau of the Association of American Medical Colleges is playing a helpful part in the matter, and as the bureau develops its scope it may become even more useful. Fundamentally, however, in Boston we feel that, since hospitals, students and medical schools recognize the evils of the present way of doing things, the reason that these evils have not been corrected must depend on lack of positive leadership and a lack of any well defined, broad policy.

If the schools would agree to give out no information regarding any student's abilities to any hospital before a certain date to be agreed on, part of the more ruthless competitive meth-

ods now in use for attracting interns might be done away with. And if the hospitals would live up to an agreement not to examine intern candidates or to make intern appointments before a date to be set by the American Hospital Association, the matter would be still further clarified. Finally, it might be possible for the teaching hospitals to combine examinations in some manner and to interchange candidates, thus doing away with unnecessary examinations and traveling on the part of students.

THE HIGH ROAD

Abridgment of an address by Dr. Howard T. Karsner, professor of pathology, delivered at the commencement exercises, Western Reserve University School of Medicine, June 15, 1938, and published in the Clinical Bulletin of the University Hospitals of Cleveland, September 1938.

Ordinarily a long life may be expected to have furnished equanimity and wisdom. Add to this a life in a laboratory, secluded from the bewilderments and hurly-burly of competitive efforts in the world of affairs, with time for meditation and leisure, the setting is right for an outlook of wide perspective. If that laboratory man happens to be a pathologist, his hands stretch out on one side to the so-called nonclinical divisions and on the other to the glamorous clinics. He may be not much of a scientist and nothing of a clinician, but he has an acquaintance with both and he usually thinks his field gives him privileges in the way of liberal interpretations.

What can he say to those who are ready to enter the fields of practice? Can he give advice about the details of practice and, if he could, would his recommendations have concrete value? What can he say about the specialties and the specialists? Can he dilate on the confused state of world affairs? Tempting as these questions are, this occasion gives me the opportunity to speak of broader principles in the hope that they will offer guidance to the high road to a happy life spent in service of one's fellow men.

This is said in no spirit of abstruse altruism. It refers rather to the adventures of that scientific pursuit which, by the selection of a career, students have laid out for themselves. Full of interest in its daily work with patients, exciting in its new discoveries, enlightening in its contacts with the phenomena of nature, revealing in its study of mind and matter, consoling in its successful results and tragic in its failures, this calling of ours has spiritual rewards not to be equaled in any other profession.

The distinguished members of our profession all have put something more into their work than their less noteworthy colleagues. To be sure they have an aptitude, a gift, a flair for the

task, they have had good fortune from time to time, but they have applied themselves incessantly to attain success and, above all, they have believed in and loved the job they chose. Claude Bernard once said "We stand upon the intellectual shoulders of those medical giants of bygone days and, because of the help they afford us, we are able to see a little more clearly than they were able to do."

There are features of our profession which deserve particular thought. First, some comment about the case as a patient. You have devoted the major part of four years to becoming competent to determine the disease from which the patient is suffering and the means of managing it intelligently. This training will always be a considerable part of your psyche and this foundation must ever be refreshed, extended and deepened. Go to meetings, read the journals, discuss with your associates, attend graduate courses but, after all, the continuation of your own initiative and progress depends on an inquiring and critical intelligence which never falters. Thus you can improve your knowledge of organic disease, without which you lose dignity as a physician and become little more than a pedler of pills. If your attention is confined to diagnosis and treatment you may know much about disease but little about the patient. This has often been spoken of as a difference between the science and the art of medicine. It is no art to be well aware of the social and psychologic implications of illness, nor is it an art to be so devoted to the welfare of your patient that with sympathy and consideration you will aid him in his necessary adjustments. It is not an art to be human and humane. These are inherent qualities of that spirit which has called you into the field of medicine. No courses in medical schools are necessary for kindly, generous and thoughtful consideration of those frailties of human nature which often alter personality when illness strikes. There are, however, dangers in sympathy. The physician must guard against allowing his feelings to overcome his judgment. Thus, in order to carry on successfully, a balance must be attained between sympathy and calm appraisal of the situation. If the doctor can assure himself that his diagnosis is correct and his treatment appropriate, he can await the outcome with poise and equanimity which are essential to him and to the welfare of his patient.

SO-CALLED IMAGINARY ILLNESSES

In your courses of instruction you have dealt largely with disease as expressed by organic disturbances. You have given consideration also to the personal aspects of disease but you probably have paid little attention to what are often thoughtlessly called imaginary illnesses. If this is true I desire to remind you that in the

practice of medicine you will be repeatedly confronted by patients with this sort of disturbance. You may easily become impatient with patients' complaints for which, even after the most careful examination, you can find no organic basis. You may be tempted often to dismiss the matter and the patient with the comment that there is nothing wrong or you may resort to some more or less shady method to shock him out of his beliefs. This may be effective, but only temporarily. Psychoneurosis is a real disease, even though you may not find an organic basis. The headache from which the psychoneurotic suffers is headache, his pain is genuine, his vomiting is not imaginary. His incapacity is an economic problem and his suffering cannot be alleviated by telling him there is nothing wrong. The child who was blind because a firecracker exploded near him was unable to see even if his eyes were normal. The boy who could not swallow was really emaciated even though his esophagus was perfect. The woman bedridden for years was an invalid in spite of the fact that her spine was unaffected. This disease does not spare man, woman or child, rich or poor; even if its basis is emotional, that in itself is fact. It is your duty to find the reason for this disturbance and to teach or reeducate your patient to adapt himself to his environment, to adjust himself to his limitations, to make himself at peace with the world. The meaning of the word doctor is teacher and it can have no better exemplification than in the management of the psychoneurotic. If the general practitioner cannot care for the patient he must not turn him away but refer him to one who by temperament and training can. This course is more than the treatment of the current attack. When properly carried out it gives the patient a new outlook, it trains him to be dependent on himself and thus prevents recurrence or new manifestations. This whole problem presses on all branches of medicine. You cannot avoid its consideration by saying that you will ultimately specialize, for all those who practice in whatever specialty must deal with the problem.

RATIONAL PSYCHOTHERAPY

This aspect of practice is more important than your individual success. Its neglect by physicians has had as much to do with exploitation by the cultists as any other factor in society. The responsibility for the upbuilding of the cults rests largely on the shoulders of your predecessors who have neglected the psychoneurotic, and the cults will continue to grow if you fail in your duty to your patients and your profession. If we in medicine were to recognize the merits of rational psychotherapy and utilize it, we would not be subject to the humiliation of having our friends and patients cured by a

twist of the foot or a travestied verse from the Bible, nor need we resort to these tricks. We cannot comfort ourselves that this quackery appeals only to the unintelligent, for we know well educated, fine people who voluntarily subject themselves to it. The reason behind this is often that the doctor has failed in his job. He has neglected psychoneuroses and has left the patient to his own resources. The patient, unfamiliar with the nature of or reason for his illness, then turns to some one who will help him. It is no reflection on his education or intelligence that he does not know what ails him. His doctor has failed him and he still needs help. The personality and salesmanship of the quack are ready substitutes for appropriate medical care. What we need is to fulfil our function as teachers. We have our faults, we shall make errors, we shall find that new discoveries make our older methods obsolete, we shall learn that truth is only relative. In spite of failures we can point with pride to our progress. With continued study, widening experience, careful observation and sound logic our successes become proportionately greater. Let us be true to our calling and earn the tranquillity that loyalty engenders. Go forth on the road and follow it to the heights. I wish you all success and happiness.

PHYSICAL FITNESS AT UNIVERSITIES

Abridgment of a discussion published in Nature, May 14, 1938. It refers especially to universities in England.

Those Englishmen who are acquainted with the universities of Canada and the United States have long had cause for astonishment at the way in which the universities of Great Britain have lagged behind those of America in their care for the health and fitness of their students. In those countries at any rate it cannot be suggested that the desire to produce a healthy population is a sign of latent militarism or of any peculiar brand of politics. To an American or Canadian student—or professor—visiting Great Britain it seems incredible that in most universities there is no medical examination whatever, either at entry or later on, no organized system (voluntary or compulsory) of physical exercise, little provision (except in a few privileged places) for healthy recreation “in the spare half-hour,” no arrangement to provide medical or surgical advice or treatment when required.

The causes of this neglect are various and to some degree, at least, a matter for speculation: the medieval view, based on a false antithesis of mind and body, that the universities exist solely for the training of the intellect; a superstitious horror of anything which might savor of organization, discipline or compulsion in

personal affairs; a belief in the magic of laissez-faire; the dominant position in public life of Oxford and Cambridge, where the colleges exert a parental influence, where most of the students are not so poor, and where games and recreations are much easier to get; indifference; a fear that students themselves might not cooperate. The last cause at least is removed by the publication of a pamphlet¹ on behalf of the students themselves. It is peculiarly timely because, unknown to its writers, a new movement was already under way and that movement will be given greater confidence and strength by the knowledge that the National Union of Students is openly and emphatically sympathetic. The committee of the union which discussed the matter “was struck with the fantastic lack of attention there had been in this country to scientific methods of physical education. . . . It became more and more impressed with the importance of preventive as well as curative methods.” The systems in other countries, it found, “indicate a very general acceptance by the universities of a great measure of responsibility for the physical as well as the intellectual well-being of their students, a responsibility which is still to a large extent shirked by the universities of Great Britain.”

FACILITIES FOR RECREATION

In the autumn of 1937 the National Fitness Councils for England and Wales and for Scotland invited the University Grants Committee to advise on the distribution of a capital sum of £230,000 to aid the universities of Great Britain in providing urgently needed facilities for healthy recreation and for physical exercise. The sum itself is small—only about one tenth of the annual Treasury grant, for all purposes, to the universities—and it can do no more (it was not intended to do more) than catalyze the interest of the universities themselves and perhaps of their potential benefactors. That, however, it is beginning to do, and although the £230,000 itself cannot be spent otherwise than on facilities for healthy recreation—on gymnasiums, swimming baths, squash courts and the like—it has set the universities thinking and planning, and ultimately very much more may result. In most of them, indeed if not all, voluntary medical examinations are to be instituted, lectures will doubtless be given on matters relating to health, the status of members of the staff dealing with physical training is to be raised, the cooperation of scientific and medical departments is to be sought, committees are to be formed to consider the place of student health as a proper function of a university and probably, under the guidance of the Medical

1. Student Health: Report of an Enquiry into University Health Services by the National Union of Students, London, National Union of Students, 1938.

Research Council in certain special centers, a scientific examination of the problem is to be instituted. An attempt is to be made in fact to give to the subject of bodily and mental health and fitness its proper university status. Those, however, who take a longer view will realize that it is not merely "student health" as such which is to be aimed at but, through the universities, the intelligent and conscious application of a new biologic outlook on human beings, an outlook intended ultimately to affect the entire community.

To recognize disease, minor ailments, chronic undernutrition, mental trouble or anything lowering the level of happiness, fitness and usefulness in university students, and to provide means of improvement, are important enough. Even more important, however, in the long run is to send out steadily into the community a stream of intelligent and keen young people who have learned, even in a minor way, what a health service can do for them and their friends, and how necessary it is to the happiness and well-being of the people.

ACHIEVEMENTS OF STUDENT COUNCIL

The Student Council at Wayne University College of Medicine, Detroit, has matured as a competent student self-government body, said the dean, Dr. Raymond B. Allen, in his recent annual report. Among its noteworthy achievements have been the establishment and successful administration of an honor system for the conduct of examinations in the college, the publication of the student-alumni journal, which is entering its second successful year, the publication of a student handbook, the creation of an interfraternity council, the establishment of a local chapter of the National Association of Medical Students and the institution of student-faculty-alumni hanquets, which have served as an active socializing influence for all three groups and have helped to develop an *esprit de corps* and pride in the school without which the work of the faculty would be without real value.

Another significant contribution of the Student Council has been its analysis of student questionnaires which solicited constructive criticism on the medical curriculum. This study clearly indicates that the students recognize the importance and value of sound fundamental training in the medical sciences. Suggestions have been forthcoming which have helped to improve the effectiveness of the teaching program. The faculty recognizes that students are not competent to pass on the content of the medical curriculum, but it appreciates that students are in a position to know whether or not the faculty efforts are effective in attaining educational objectives.

One aspect of the Student Council's study relates to the economic status of the students. Inquiry was made into the outside activities of students which of necessity detract from their ability to apply themselves to medical studies. The council was not surprised to find that a large proportion of the students support themselves entirely or in part through gainful employment. Some students hold eight hour night positions in industry. The majority of these, however, are engaged in some form of medical service, usually in the nature of first aid posts in industrial plants. Fortunately, such duties are not arduous and serve in some ways to promote rather than hinder their medical education. However, it is perfectly clear, Dean Allen said, that a large fraction of students do not receive sufficient financial support to be in a position to gain the greatest possible benefit from their studies. This study, therefore, indicates that means must be found for furthering the security of deserving, needy students. The board of education and the alumni association of the college of medicine have, through loan funds, rendered great help in the neediest of cases. Many students, however, are reluctant to go into debt for their medical education and do so only in the greatest extremity, usually to meet tuition fees. The solution is obvious: scholarships should be available for students who have proved their right to such subsidy. Some aid is rendered through the National Youth Administration and through student assistantships. These devices, however, are not to be encouraged for the reason that the student is required to give time which he would otherwise be devoting to his studies.

Interest in Civic Affairs

It is just as important that physicians be made social conscious as it is that the public be made health conscious. This can be brought about effectively by emphasis on the community aspects of medicine both in the medical school and after graduation. Such a study and social interest on the part of the medical profession will insure its rightful heritage of preserving the health of the public and supervision of all forces engaged, for four reasons: First, it will stimulate the young physician to take an active interest in civic affairs, and to seek and accept public positions for which his training makes him especially adapted. He will thus become more familiar with the social and medical status of his community, and sympathetic with and interpret the needs of the man of the street. Secondly, it will give the physician a better understanding of the factors which may have lowered the patient's resistance and apply appropriate measures to remove them. It is generally recognized that a patient's mental attitude often has a great influence on the course of a disease. Social and economic conditions directly affect the mental status of the patient and are often, therefore, of prime importance in dealing with his disease.—Wahl, H. R.: Community Aspects of Medicine, *J. A. Am. M. Coll.* 13:14 (Jan.) 1938.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

Student Book Exchange at Michigan

The Board of Regents of the University of Michigan, Ann Arbor, at a meeting in December, gave permission for the establishment of a Student Book Exchange at the university on condition that only used books would be handled. A committee was formed comprising the dean of students, the dean of women, and representatives of the Michigan Union and the Michigan League to direct the venture. The exchange operated for the first time February 3-17 and sold books to about 2,000 students. About 1,700 students left books to be sold, setting the price that they wished to receive, with the understanding that the exchange would retain 10 per cent of the sale price to cover expenses. The next sale of used books will be in September, for which books will be received in the exchange as early as June.

New Division of Bronchoscopy

A division of bronchoscopy and esophagoscopy is being organized at Louisiana State University Medical Center, New Orleans, in anticipation of the opening of the new Charity Hospital, which will contain a fully equipped unit provided with biplane fluoroscope and similar equipment. Dr. George J. Taquino will be in charge of the division in the medical school, the staff to consist of members of the department of surgery and the division of otorhinolaryngology. Dr. Chevalier Jackson, Philadelphia, has been visiting professor of bronchoscopy and esophagoscopy at the medical center since it was opened in 1931.

Banquet for Premedical Students

The fifth annual banquet for premedical students throughout Texas was held recently under the sponsorship of the Texas Alpha chapter of Alpha Epsilon Delta. Dr. John W. Spies, dean, University of Texas School of Medicine, Galveston, was toastmaster; the speakers were Drs. Holman Taylor, Fort Worth, secretary of the Texas State Medical Association, and Dr. William R. Houston, Austin. Seven colleges were represented by 364 premedical students.

Dr. Lapham Appointed Dean at Tulane

The president of Tulane University has announced the appointment of Dr. Maxwell E. Lapham as dean-elect of the school of medicine of the university to succeed Dr. Charles C. Bass in 1940. In that year Dr. Bass will reach the retiring age.

Dr. Lapham, now 39, was born in New York and graduated from the University of Pennsylvania School of Medicine in 1925, following which he served two years as an intern at the Presbyterian Hospital, Philadelphia, and then was house surgeon at the International Grenfell Hospital in Labrador. He was a resident in the University Hospital, Philadelphia, for two years and then engaged in the private practice of medicine for three years. In 1933 Dr. Lapham took up graduate medical extension teaching, giving courses of instruction to practicing physicians throughout the state of Virginia under the auspices of the University of Virginia and in cooperation with the Virginia State Medical Society and the Medical College of Virginia. Later for two years he gave extension courses in obstetrics to practitioners in Mississippi in

cooperation with the Mississippi State Health Department, the Mississippi State Medical Society and Tulane University.

In 1937 Dr. Lapham was appointed director of the extension division of the department of graduate medical studies at Tulane. He will continue in this capacity for several months, as well as in his work as assistant professor of obstetrics and in the fall he will undertake a tour of the medical schools in this country and in some foreign countries.

Examinations for Internships in Naval Hospitals

An examination is held in November each year for senior medical students of class A medical schools who desire to obtain an internship in one of the United States naval hospitals. Senior medical students who qualify for appointment to an internship will be appointed acting assistant surgeons with rank of Lieutenant (junior grade) for temporary service during the intern year. On satisfactory completion of the internship, the intern will be allowed to appear for competitive examination for appointment as assistant surgeon with the rank of Lieutenant (junior grade) in the medical corps of the navy. Should the intern desire to return to the practice of medicine in civil life, his appointment as an acting assistant surgeon will be terminated and he will be honorably discharged from the naval service. To be commissioned in the medical corps of the navy the candidate must be a citizen of the United States between 21 and 32 years of age and he must pass both professional and physical examinations. On accepting an appointment as acting assistant surgeon for internship, the officer will receive a compensation of \$2,699 a year if he has no dependents, and \$3,158 a year if he has dependents. Successful candidates for appointment as interns will be appointed in July and will be assigned for internship to a naval hospital either in Boston, New York, Philadelphia, Washington, D. C., Norfolk, Va., San Diego, Calif., or Mare Island, Calif. The period of internship is one year, is rotating and consists of about five months medical, five months surgical and two months laboratory duties. For additional information address the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Harvard Extends Its Public Service

Extension of the public service of the Harvard Medical School in Boston through the newly formed department of legal medicine was announced January 5 by the dean in his annual report. Dr. Alan R. Moritz, after another year in Europe, will return to build up the department of legal medicine and to put at the disposal of the state the contributions that such a department can make to problems of law enforcement and of public health which come within its scope. Dr. Moritz came to Harvard from the University Hospitals, Cleveland, in 1937, to be the first holder of the professorship of legal medicine established under the terms of a gift designated as the George Burgess Magrath Endowment for Legal Medicine. He succeeds the late Dr. George Burgess Magrath, who taught legal medicine at Harvard from 1907 to 1937.

Dean C. Sidney Burwell said that the medical school has a direct and useful contribution to make to the community and that in turn it is dependent on many

community organizations for essential parts of its teaching opportunities.

The Harvard Medical School is associated with fourteen local hospitals through clinical teaching or investigation. A close coordination exists between the state department of public health, the department of public health of the city of Boston, similar departments in other cities, and appropriate departments of the medical school and school of public health. Thus the medical school is happily able to make some return to the community which supports it not only in training practitioners of medicine and investigators, Dean Burwell said, but in contributing to the care of the community's sick and to other aspects of community life where expert medical knowledge is useful.

The Wassermann Laboratory of the Massachusetts Public Health Department, established in 1909 by the Medical School, is still housed in Harvard buildings. The laboratory affords facilities for testing the blood and spinal fluid of patients in the state hospitals for mental disease. In 1917 the Massachusetts State Tumor Diagnosis Service was established as a joint activity of the Massachusetts Department of Health and the Collis P. Huntington Memorial Hospital of Harvard. This service supplies pathologic diagnostic service for physicians in the state and for hospitals without service of their own. Harvard Medical School also organized and established the Vaccine and Serum Laboratory at Forest Hills. For several years the Faculty of Medicine has arranged a series of public Sunday afternoon lectures on medical subjects at which last year the total attendance was more than 3,000.

Medical College of Virginia

The historic Egyptian Building at the Medical College of Virginia is being made fireproof; the remodeling will also provide an auditorium seating 400, done in the Egyptian manner. In the future the Egyptian Building will house the departments of pathology and bacteriology.—An eighteen story hospital to replace the Memorial and Dooley hospitals is under construction and should be ready for occupancy in the spring of 1940.—An additional floor which is being added to McGuire Hall will furnish medical facilities for the departments of physiology and pharmacology.—The new dormitory completed last July has been named Hinton Hall in honor of the late Eppa Hunton Jr., a member of the Board of Visitors for many years. These and other construction projects at the Medical College of Virginia will involve an expenditure of more than \$2,000,000.

Yale Alumni Day

Special lectures, clinics, ward rounds, laboratory demonstrations and conferences were presented at Yale University School of Medicine, New Haven, Conn., February 22, in celebration of Alumni University Day. Guests were also invited to visit the laboratories and see the facilities of all departments of the school, including the Clinic of Child Development and Laboratories of Primate Biology. There were demonstrations of the ultracentrifuge, of the laminograph, of the bio-electrical potentials in living systems, of the apparatus for studying electrophysiology of the brain, of the heart sounds by loud speaker and of monkeys and chimpanzees with spinal and cerebral lesions. The day closed with an assembly in the auditorium of Sterling Hall of Medicine, which was addressed by Drs. Francis G. Blake on "Sulfapyridine in Pneumococcal Infections," Milton C. Winternitz on "The Pathology of Arteriosclerosis," Hugh M. Wilson on "Body Section Roentgenography," and by the dean, Stanhope Bayne-Jones, on "Plans for the Future of the School."

Ohio State Board Questions

Following are the questions used by the State Medical Board of Ohio in practice, Dec. 7, 8 and 9, 1938, at Columbus:

1. A patient returning from a late summer motor trip, complains of headache, diarrhea and slight fever of ten days' duration—what would you suspect and what other signs would you look for? How establish a diagnosis?
2. Give three possible terminations of arterial hypertension and upon what sign would you base the most probable in a given case?
3. Discuss undulant fever: the etiology, usual source in this country, symptoms and treatment.
4. Give the symptoms of suspected coronary occlusion and how to establish the diagnosis?
5. Give the symptoms of Addison's disease with treatment.
6. Give the usual etiology of enuresis and treatment.
7. How would you recognize pyloric stenosis in a recently born infant?
8. How would you manage a case of acute diarrhea in a 1 year old child?
9. Enumerate the most common symptoms of schizophrenia. Give the clinical course of a typical case.
10. Name the most frequent organic psychoses and state the most common mental symptoms characteristic of the entire group.

Convention of the Association of Medical Students

The third annual convention of the Association of Medical Students held in Philadelphia beginning Dec. 22, 1938, was attended by 303 delegates, of whom 279 were medical students and twenty-four were visitors, including one representative of the American Youth Congress; the women medical student delegates numbered thirty-eight. The delegates came from twenty-four states and the District of Columbia; India, Korea and Canada were also represented, while six premedical colleges sent representatives to learn about the Association of Medical Students. Twenty-three resolutions were passed at the business session. The program of this convention was published in the December Student Section in THE JOURNAL. Student Trawick H. Stubbs of Emory University Medical School, Atlanta, Ga., and Student David E. Hepford, Temple University Medical School, Philadelphia, were elected co-presidents of the association for this year.

Senior Students Tour Pharmaceutical Laboratories

The present seniors of Indiana University School of Medicine made a tour of inspection of the Eli Lilly & Co. pharmaceutical laboratories at Indianapolis recently and were guests at a luncheon at the laboratories and a dinner at the Hotel Severin. Dr. Clayton G. Weigand was the principal speaker; Dr. Willis D. Gatch, dean of the medical school, represented the students on the program. An annual tour of inspection of these laboratories has been made by each senior class for nearly twenty-five years.

Dinner to New Dean

Dr. William S. McEllroy, who was recently appointed dean of the University of Pittsburgh School of Medicine, was honored with a dinner at the Hotel Schenley March 1 by alumni of the school and friends. Dr. Charles H. Henninger, Pittsburgh, president-elect of the Medical Society of the State of Pennsylvania, was master of ceremonies, and addresses were made by Chancellor John G. Bowman, Dr. Alexander H. Cotwell and Dr. McEllroy.

Annual Lecture at University of Colorado

The first annual Nu Sigma Nu lecture before the faculty and students of the University of Colorado School of Medicine, Denver, was delivered April 7 by Dr. Walter L. Palmer, associate professor of medicine at the School of Medicine of the Division of Biological Sciences, University of Chicago, whose subject was "Recent Advances in the Study of Gastric Disease."

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COLLEGE EDUCATION FOR THE FUTURE DOCTOR

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You will all remember the old definition of an expert as an ordinary man away from home giving advice. Although I am a fair distance from my academic base, I should like to think that I could qualify on other grounds as an expert on the subject that I am venturing to discuss this morning. What I have to say concerns premedical training and in a previous incarnation I spent a great deal of time with premedical students. I taught organic chemistry for some dozen or more years in the winter and in the summer to both men and women. I have written innumerable letters to many of the deans present in this audience, recommending in no uncertain terms people whom, I regret to state, I knew all too little about. Furthermore, I have taken part in innumerable discussions with other chemists from many colleges about educational matters and almost without fail the conversations turned to a discussion of some of the iniquities of the medical school admission committees. More recently I have had the opportunity of discussing educational matters with deans and college administrators and again the problem of the relation of medical schools to liberal arts colleges has repeatedly arisen.

According to statistics published a few years ago somewhat more than 50 per cent of the students entering the medical schools of the country complete a four year college course. Another 27 per cent finish three years of collegiate work. It is with these students who comprise about three quarters of the matriculants in our medical schools that I am concerned this morning. What sort of an education should these future doctors receive in college? It seems to me that we cannot answer this question in general terms. There probably are as many answers as there are students. But before we come to the difficult matter of prescribing for the future let us examine the present situation. Let us see how the premedical requirements of the various medical schools affect the present college education of the future doctor.

It is important to bear in mind that today there probably are two applicants for every position in a first year medical class. For certain of the schools, the ratio may run as high as ten to one. Certain effects of this competition I think have not been generally appreciated, though they are clearly evident to those teachers

and administrators in our colleges who are concerned with premedical education. I have received testimony from many different colleges that the desire to present a convincing record of scientific work to impress the admission committee is a potent factor in determining a student's program. It is not a question of doing well in the minimum prescribed courses in chemistry, physics and biology. It is not a question of taking more science either as an educational discipline or because the student likes the work. It is merely a question of taking scientific courses solely to impress the medical school authorities.

I realize that officially almost every medical school is at pains to deny that any preference is given to candidates who have studied more than the minimum premedical subjects. I know that many deans, professors and members of the medical profession protest that what they all desire is a man with a liberal education—not a man who has been through four years loaded with premedical sciences. The trouble is very few people believe this group of distinguished witnesses—least of all the students. And since each case of acceptance or rejection of a candidate for admission to a medical school cannot be argued in open court and the decision of the committee duly publicized, misunderstandings and, indeed, fantastic rumors are bound to arise.

Now those who complain about the present situation (and their name is legion) are not necessarily opposed to a scientific course in a liberal arts college as a preparation for medicine. What they are opposed to is, first, what they believe to be the inconsistency between the theory and practice of the admission offices of the medical schools; second, the pressure on all students who want "to play safe" to take more than the minimum premedical requirements whether they are interested in science or not; and, third, the apparent failure of the medical schools to clarify their own desires with regard to even the minimum premedical requirements.

That there is some confusion in the medical faculties themselves in this matter of premedical requirements, I am sure this audience will agree. Part of the difficulty arises from the fact that the total professional training of a medical man must depend to some extent on his plans for the future. If he is to become a research worker in medical science he should study the fundamental sciences in considerable detail in college. If he is to be a general practitioner the minimum scientific premedical requirements may well suffice. Since this total professional training includes the college years, it is impossible to draw up blanket specifications for the college education of the future doctor without answering the question "What sort of a doctor is the man to be?"

A rather amusing illustration of the present confusion of opinion in the medical profession concerning premedical studies was brought out by replies to a recent questionnaire sent to a small group by the dean of one of our large medical schools. Members of the faculty and eminent practitioners living nearby sent in long letters. I have taken the liberty of combining extracts from these documents in what I must admit is a highly arbitrary manner. I assure you that the general effect which the following synthesized statement leaves in the reader's mind is not a bit more confusing than the effect of reading all the letters in toto. Here is the composite opinion as to premedical requirements:

Good fundamental education in physics, biology, chemistry, zoology and comparative anatomy, he should have a reading knowledge of French and German . . . in addition to being well grounded in inorganic chemistry it would be desirable for the student to be well prepared in the elements of quantitative chemical procedures and in the laws governing the behavior of electrolytes in solution . . . The student's curriculum should include thorough courses in general zoology or general biology, comparative vertebrate anatomy and vertebrate embryology. The growing importance to the general physician of a knowledge of genetics makes a course in this subject very desirable . . . But it is to be hoped that the student would spend most of his time at college working in history, English and literature for the last chance most medical students have at any type of cultural courses is gone with the granting of the A.B. degree . . . [In summary] we would say that a student should bring with him to the medical school a fair degree of native intelligence, a fine character, an integrated personality and a training which has taught him the rudiments of the scientific manner of thinking . . . A modicum of factual knowledge in the special fields of chemistry and biology is also important.

The present situation is to say the least somewhat obscure. The difficulties of laying down one set of rules to cover the college education of all future doctors—even the scientific education—seems to be insurmountable. We are confronted with the fact that today the liberal arts colleges are expressing more and more dissatisfaction with the premedical requirements and the procedure of medical school admission committees. This dissatisfaction comes from presidents, deans and teachers of the humanities as well as from those directly concerned with teaching premedical subjects. What is to be done about it? I have heard only one concrete suggestion for a radical change that seems to me to offer hope. I venture to pass it on with enthusiasm, but without too much expectation that it will be accepted. The suggestion is as follows: Encourage college freshmen who are looking forward to a medical career to apply for admission to a medical school three years in advance. Let the admission committee base its rejection or conditional acceptance of such applications on the school record, on the first year college record, and on performance in such tests as the scholastic aptitude test. After the undergraduate in question has been tentatively enrolled as a future medical school student, let there be cooperation between the medical school and the college in working out through a joint committee an intelligent college program for the remaining three years. For those with a real scientific bent, concentration in chemistry or biology or a combination of the two may be in order. For others the main line of endeavor may be history or philosophy or literature with only the minimum amount of science. The program would be made to suit the student. The representatives of the medical faculty would have in

mind the needs of the profession, and the representative of the college faculty would supply intimate knowledge of the student and the offerings of the institution in question. The joint committee should insist on every student's broadening out as much as possible during his college years. The fact that the medical school faculty was concerned with the college work of the premedical student would, I believe, lend an authoritative tone to any regulations which emphasized the importance of nonscientific studies. There are some undergraduates who follow more readily the guide of a professional faculty than the advice of college professors. In short, intelligent guidance would be possible. At present the competitive system and the mystery surrounding the science requirements put both the college teacher and the college student in a position where in many cases intelligent guidance is no more possible than in betting on a horse race. A further obvious advantage of the proposed scheme is that some 6,000 to 10,000 students who now prepare for medical school and fail each year to gain admittance would not be led down an educational path which comes to a dead end. Of course, even if this radical reform were widely adopted it would be necessary to reserve a certain number of places in each first year medical class for promising students who decided late in their college career to study medicine.

There are many objections to the proposal which I am sure are springing up in your minds. Most serious, at first sight, would be the difficulty of deciding at so early an age as to the promise or lack of promise of the boy in question. This difficulty is, I believe, not as great as might be assumed. The evidence available indicates that there is an excellent correlation between the criteria I have suggested and those usually employed (i. e. the total college record). If this is so, the mistakes would be no greater perhaps than now. The difficulties of judging as to the prospective student's character and personality are great, I admit. But, on balance, the advantages of such a scheme might outweigh the disadvantages.

Let me consider the question of the purely scholastic capacity of the student. At present this is estimated from the college record and from the letters that professors write about his actual ability in courses. The evidence which I have been able to gather indicates that there is a very close correlation, at least in Harvard College, between the work of the freshman year and the subsequent college record of the man. Furthermore, there is a fairly good correlation between many of the criteria which we use for admission such as school record and examination and the total college record. This being true, it is clear that there would be only a slight error introduced if the work of the freshman year and the school record were used as a basis for admission to the medical school instead of the present four years' work in college. To illustrate, may I give you a bit of evidence (I cannot claim it is conclusive) which I had gathered by the Assistant Dean of Harvard College. He examined the records of a group of men in Harvard College who went on to the Harvard Medical School and found the correlation coefficient between the freshman year's work and the whole college record to be 0.73 (significantly high). Or, to put the matter in more concrete form, let us suppose that the Harvard Medical School had selected from among the Harvard College candidates solely on the basis of their academic record. Of the first fifty-six men whom they would

take on the basis of their entire college record, forty-two would have been taken on the basis of the freshmen year alone. And, of the fourteen who would have been selected as freshmen but on the basis of their four year records would not have "made the grade," eight were borderline cases; and only six did very poor work during the remainder of their college career. There would have been six bad selections, but there is no reason at all why in such a scheme as I am suggesting acceptance might not be conditional on the student continuing to have a respectable record in the remaining three years of his college course. I think this evidence is enough to show that there is no very serious obstacle to the scheme from the point of view of estimating the student's intellectual capacity.

Now I, for one, am not ready to advocate this radical departure on a large scale. But I should like to urge that a conference of deans of half a dozen medical schools and a couple of dozen liberal arts colleges might explore the possibilities in this direction. What the proposal amounts to is a recognition that the four years in college and the four years in medical school be considered as a total educational unit and that the individual student be guided through these eight years by advice from both the college and the medical school authorities working together.

If such a conference of college and medical school authorities could be convened for a discussion of this problem, there are one or two other less radical suggestions I should like to urge for consideration. First, I should like a subcommittee of biochemists from the medical faculty and chemists from the college to try to formulate some more concrete outline of the minimum requirements. Similarly, the anatomists and the physiologists on the one hand and the biologists on the other might come together. I am not afraid of too narrow a premedical course nor am I afraid that the medical schools would dictate to the colleges. I believe cooperation is much to be preferred to the present highly unsatisfactory exchange of mutual recriminations.

Finally, I should like to urge upon the medical school faculties a serious consideration of ways and means of insuring that the future doctor may not only really receive the rudiments of a liberal education in college but be inspired to continue his liberal education throughout his professional course. To make any such proposal effective is difficult in the extreme. It can be done only if the medical school professors are willing to pay more than lip service to the ideals of a liberal education. Even four years in college devoted entirely to languages, literature, history, philosophy and the social sciences is too short a time to provide a truly liberal education. It is essential, it seems to me, to develop a sympathetic point of view in the medical schools toward a continuation of a student's education in something besides medicine. If the colleges will cooperate with the medical schools in guiding the student through the four years before he enters the medical school, will the medical schools in turn try to pay some attention to keeping alive the liberal arts tradition in the student's mind while he is studying medicine? Perhaps the history of medicine would provide in some instances the central core around which a continuation of liberal studies could be continued in a medical school. For others a discussion of the problems of socialization of medicine might furnish a basis for interest in something outside of medical work.

Above all, if doctors could be made to acquire the habit of reading something other than scientific or professional literature on the one hand, or trash on the other, much of the complaint about the narrowly trained specialist would disappear. For the capable student who can work quickly there is time enough I feel sure. But the motivating force toward a liberal education is totally lacking in most of our professional schools today.

In short, I am advocating this morning a consideration by medical school and college authorities, acting together, of the scientific, professional and liberal education of the future doctor. I am suggesting that we try discarding the old concept of four years of scientific and liberal education followed by four years of professional training. In place of this we might regard the whole eight years as a unit with the aim of providing a balanced intellectual diet suited to each student's talents and interests in the hope that we might thus reach our goal of turning out both a well trained doctor and an educated man.

THE ORGANIZATION AND SUBJECT MATTER OF GENERAL EDUCATION

ROBERT M. HUTCHINS, LL.D.

President, University of Chicago

CHICAGO

Since you have two other college presidents on the program to tell you about college education it is obvious that you do not expect from any one of them the answer to your questions about it. You believe, like the rest of the world, that all presidents are liars, and you hope from a study of the differing lies of the three of us to discover the truth for yourselves. Speaking for myself, I find Mr. Conant's lies very persuasive, so much so that I shall drop out of this paper as I go along any lies of my own that are in conflict with his.

I assume that we are all agreed on the purpose of general education and that we want to confine our discussion to its organization and subject matter. I believe that general education should be given as soon as possible, that is, as soon as the student has the tools and the maturity it requires. I think that the program I favor can be experienced with profit by juniors in high school. I therefore propose beginning general education at about the beginning of the junior year in high school. Since I abhor the credit system and wish to mark intellectual progress by examinations taken when the student is ready to take them, I shall have no difficulty in admitting younger students to the program if they are ready for it and excluding juniors if they are not.

The course of study that I shall propose is rigorous and prolonged. I think, however, that the ordinary student can complete it in four years. By the ingenious device I have already suggested I shall be able to graduate some students earlier and some later, depending on the ability and industry that they display.

General education should, then, absorb the attention of students between the ages of 15 or 16 and 19 or 20. This is the case in every country of the world but ours. It is the case in some eight or nine places in the United States. Where the high school and the junior college are part of a large city school system, the organization

has been successful. Where, as at the University of Chicago and Stephens College, the institution has either a small high school or none at all, the insignificant size of the first two years of the program and the large size of the last two create great difficulties. If you have seventy students entering the four year unit at the junior year in high school and 700 entering at the freshman year in college, it is absurd to talk about a coherent four year program. You must have a curriculum that the 700 can enter in the middle without being handicapped because they did not enter at the beginning.

If in such institutions as my own the scheme I advocate is to succeed, we shall have to convince local parents, at least, that it is wise for them to send their children to us two years earlier than they have been accustomed to sending them. I think that if parents cannot be persuaded to do this the University of Chicago should abandon collegiate work altogether and give up its freshman and sophomore years. Those years at present are a foreign body in the otherwise admirable constitution of the university. The students in them have different ambitions from those in the divisions above; the teachers have different ambitions, too. But if ties cannot be found for these two years above they must be found below; for I do not believe that two years at any level is long enough to provide an adequate education. It is suggestive that two year units do not exist anywhere else in the world; they are known only in the United States.

I may mention at this point one aspect of the organization of general education which ought to be trivial but in this country is most important. I favor awarding the bachelor's degree in recognition of general education; I favor awarding it at about the end of the sophomore year. This suggestion is not so startling as many people seem to think. President Butler of Columbia advocated it in his annual report for the year 1901-1902. In France the *baccalaureat* is used to indicate the satisfactory completion of general education. The reasons for giving it the same significance here are first that it now has no significance at all. The bachelor's degree means four years in college. As the president of Hiram has lately said, "To most college 'students' who sit long enough and patiently enough and docilely give back a modicum of the wisdom that has flowed past their ears, there will come in time the reward of their long-sitting, sheepskins to cover their intellectual nakedness. . . . The usual requirements for graduation, 'a minimum of 120 hours with additional credit for physical education,' may represent little more than hours of painful but patient sitting. Their blood relationship to achievement is so far removed as to make the claimed relationship laughable."

But it is not only the credit system and the examination-by-the-teacher-who-taught-the-course system that make the B.A. certify merely to four years of sitting. It is also and I think principally the fact that the standard four year college of liberal arts is and must be concerned with both general and specialized education. Even in some of the oldest and most conservative of these colleges you will find that the student may indulge in extreme specialization at an early stage. Yet the preparation with which students enter these colleges is such that the colleges must also give them a general education. These two aims can only confuse the colleges and hence confuse the significance of the degree that they offer.

Columbia, Johns Hopkins, Chicago and several other places have attempted to meet this situation by dividing the first two years from the last two. Some institutions have even given them different staffs and administrations. Here we face again the problems raised by two year units. The first two years is not long enough for general education; the last two is not long enough for advanced study. The remedy would seem to be a four year unit beginning with the junior year in high school and leading to the bachelor's degree, and after that a three year unit beginning with the junior year in college and leading to the master's degree. The bachelor's degree would then indicate an adequate general education and the master's an adequate experience in advanced study. This master's degree should also indicate that the holder is qualified for a teaching position in which research is not expected or required.

The last two years of the present college of liberal arts is left stranded when the college is divided into upper and lower divisions. We have found at Chicago that one of our more difficult problems is how to provide any intelligible plan of advanced study in the junior and senior year. Some of our departments have succeeded in persuading students to plan their courses beginning with the junior year for three years to the master's degree. These departments have been able to effect notable improvements in both the general cultivation and the specific training of their graduates. I recommend the award of the bachelor's degree at the end of the period of general education, that is at about the end of the sophomore year, for the sake of advanced study as much as for the sake of general education.

It may be objected that many students will not want to add a year to their program of advanced study. This in my view is an argument for the plan. The educational system will be compelled to accommodate the youth of the nation up to the end of the junior college, that is, to about 19 or 20. There is no reason why it should accommodate them after that. Beginning with the junior year, education should be limited to those who are able and willing to profit by it. We should rigorously select our students at the university level, by which I mean the beginning of the junior year. Since, therefore, many students should terminate their education at the end of the sophomore year, one problem is how to induce them to do so. I think they will stay on and, through sheer importunity, get themselves a degree unless they can receive some recognizable and popular insignia at the end of the sophomore year. The bachelor's degree is recognizable and popular. Since it serves no useful purpose at present, I believe it should be made to serve the very useful one of persuading students to get out of education who should not be permitted to remain in it.

If general education is to be given between the beginning of the junior year in high school and the end of the sophomore year in college and if the bachelor's degree is to signify the completion of it, the next question is what is the subject matter that we should expect the student to master in this period to qualify for this degree?

Now I do not hold that general education should be limited to the classics of Greece and Rome. I do not believe that it is possible or desirable to insist that all students who should have a general education must study Greek and Latin. I do hold that tradition is important in education; that the primary purpose of education, indeed, is to help the student understand the

intellectual tradition in which he lives. I do not see how he can reach this understanding unless he understands the great books of the western world, beginning with Homer and coming down to our own day. If anybody can suggest a better method of accomplishing the purpose, I shall gladly embrace him and it.

Nor do I hold that the spirit, the philosophy, the technology or the theology of the Middle Ages is important in general education. I have no desire to return to this period any more than I wish to revert to antiquity. Some books written in the Middle Ages seem to me of some consequence to mankind. Most Ph.D.'s have never heard of them. I should like to have all students read some of them. Moreover, medieval scholars did have one insight; they saw that in order to read books you had to know how to do it. They developed the technics of grammar, rhetoric and logic as methods of reading, understanding and talking about things intelligently and intelligibly. I think it cannot be denied that our students in the highest reaches of the university are woefully deficient in all these abilities today. They cannot read, write, speak or think. I do not suggest that we should attempt to introduce the trivium and quadrivium into the American college. I do say that we must try to do for our own students what the seven liberal arts did for the medieval youth. If the Middle Ages have any suggestions to make on this point, we should welcome them. We need all the help we can get.

I should like to remark in passing that in the Middle Ages people went to universities at 13 or 14. They read books and experienced disciplines that are regarded as far too difficult for university professors today. Most of the great books of the western world were written for laymen. Many of them were written for very young laymen. Nothing reveals so clearly the indolence and inertia into which we have fallen as the steady decline in the number of these books read in our schools and colleges and the steady elimination of instruction in the disciplines through which they may be understood. And all this has gone on in the sacred name of liberalizing the curriculum.

The curriculum I favor is not too difficult even for very ordinary American students. It is difficult for the professors but not for the students. And the younger the students are the better they like the books, because they are not old enough to know that the books are too hard for them to read. Something like the course of study I should favor is now in force at St. John's College, Maryland. There an unselected group of indifferently prepared students are studying these books with tremendous enthusiasm thirty-five hours a week. They read last fall ten dialogues of Plato and voted to have extra classes so that they might read and discuss the rest of them. In connection with the reading, they are going through a formidable course of instruction in grammar, rhetoric, logic and mathematics.

The entire freshman class at Columbia is now reading and discussing twenty-five of the great books in philosophy and literature. I understand that Rushing Week at Columbia was a failure because the students were too interested in the reading to be interested in fraternities, that the books are the chief subject of discussion at all informal student gatherings, and that the only complaint comes from teachers in other courses who feel that their work is suffering from the excitement the books in the Humanities course arouse. For eight years and more I have taught these books to unselected pupils in our University High School and to

freshmen, sophomores, juniors and seniors in college. Not one of them has suggested that the books were too hard or that they were not worth reading. I can testify from this experience, though not, of course, very scientifically, that students who can read anything thrive on these books and that the younger they are the more they thrive.

Those who think that this is a barren, arid program, remote from real life and devoid of contemporary interest have either never read the books or do not know how to teach. Or perhaps they have merely forgotten their youth. These books contain what the race regards as the permanent, abiding contributions its intellect and imagination have made. They deal with fundamental questions. It is a mistake to suppose that young people are interested only in football, the dramatic association and the student newspaper. I think it could be proved that these activities have grown to their present overwhelming importance in proportion as the curriculum has been denatured. Students resort to the extracurriculum because the curriculum is stupid. Young people are interested in fundamental questions. They are interested in great minds and great works of art. They are, of course, interested in the bearing of these works on the problems of the world today. It is, therefore, impossible to keep out of the discussion, even if the teacher were so fossilized as to want to, the consideration of current events. But these events then take on meaning; the points of difference and the points of similarity between then and now can be presented. Think what a mine of references to what is now going on in the world is Plato's Republic or Mill's Essay on Liberty. If I had to prescribe an exclusive diet for young Americans, I should rather have them read books like these than gain their political, economic and social orientation by listening to the best radio commentators or absorbing the New York Times. Fortunately we do not have to make the choice; they can read the books and listen to the commentators and absorb the New York Times too. I repeat: these important agencies of instruction—the radio and the newspaper—and all other experiences of life, as a matter of fact—take on intelligibility as the student comes to understand the tradition in which he lives. Though we have made great advances in technology, so that the steam turbine of last year may not be of much value in understanding the steam turbine of 1939, we must remember that the fundamental questions today are those with which the Greeks were concerned; and the reason is that human nature has not changed. The answers that the Greeks gave are still the answers with which we must begin if we hope to give the right answer today. The answers they gave have affected human history so profoundly that we cannot approach the issue of the purpose of the state, for example, without unconsciously reflecting their views. We may apply to these early thinkers the words of Cardinal Newman about Aristotle: "Do not suppose, that in thus appealing to the ancients, I am throwing back the world two thousand years, and fettering philosophy with the reasonings of paganism. While the world lasts, will Aristotle's doctrine on these matters last, for he is the oracle of nature and of truth. While we are men, we cannot help, to a great extent, being Aristotelians, for the great Master does but analyze the thoughts, feelings, views, and opinions of human kind. He has told us the meaning of our own words and ideas, before we were born. In many subject-matters,

to think correctly, is to think like Aristotle; and we are his disciples whether we will or no, though we may not know it." Do not suppose that in thus including the ancients in my course of study I am excluding the moderns. I do not need to make a case for the moderns. I do apparently need to remind you that the works of the ancients lie at the foundation of the tradition in which we live.

Do not suppose, either, that because I have used as examples the great books in literature, philosophy and the social sciences I am ignoring natural science. The great works in natural science and the great experiments must be a part and an important part of general education. Here again I am not concerned with the method; I am concerned with the end. The student should understand the leading ideas in the natural sciences. Do you think he does today? On the contrary, what he gets today is either a superficial shower from a survey course or professional instruction from the first day of the freshman year, based apparently on the notion that every member of the class is going to be a chemical engineer. General education is not professional education. The curriculum must be designed to prepare the student for intelligent citizenship. The type of scientific instruction that I received in college has no place in the kind of college I am proposing. As for survey courses of the usual variety, they have no place there either. They degenerate too easily into a rapid tour of all the facts known in physics, chemistry and biology. The basis of the scientific program should be the great landmarks of scientific work, the books and the experiments.

Neither at Columbia nor at Chicago has anybody interested in the kind of curriculum I am suggesting had the facilities for the kind of scientific instruction we have wanted to give. At St. John's College those facilities are available and are now being used. It appears that between a half and a third of the course of study will be mathematics and natural science. In fact, St. John's is the only college in the country in which every student must take laboratory science for four years.

Another problem that has disturbed those who have discussed this issue is what books I am going to select to cram down the throats of the young. The answer is that if any reasonably intelligent person will conscientiously try to list the hundred most important books that have ever been written I will accept his list. I feel safe in doing this because (a) the books would all be worth reading and (b) his list would be almost the same as mine. There is, in fact, startling unanimity about what the good books are. The real question is whether they have any place in education. The suggestion that nobody knows what books to select is put forward as an alibi by those who have never read any that would be on anybody's list.

Only one criticism of this program has been made which has seemed to me on the level. That is that students who cannot learn through books will not be able to learn through the course of study that I propose. This, of course, is true. It is what might be called a self-evident proposition. I suggest, however, that we employ this curriculum for students who can be taught to read and that we continue our efforts to discover methods of teaching the rest of the youthful population how to do it. The undisputed fact that some students cannot read any books should not prevent us from giving those who can read *some* the chance to read the best there are.

I could go on here indefinitely discussing the details of this program and the details of the attacks that have been made on it. But these would be details. The real question is Which side are you on? If you believe that the aim of general education is to teach students to make money; if you believe that the educational system should mirror the chaos of the world; if you think that we have nothing to learn from the past; if you think that the way to prepare students for life is to put them through little fake experiences inside or outside the classroom; if you think that education is information; if you believe that the whims of children should determine what they should study, then I am afraid we can never agree. If, however, you believe that education should train students to think so that they may act intelligently when they face new situations; if you regard it as important for them to understand the tradition in which they live; if you feel that the present educational program leaves something to be desired because of its "progressivism," utilitarianism and diffusion; if you want to open up to the youth of America the treasures of the thought, imagination, and accomplishment of the past, then we can agree, for I shall gladly accept any course of study that will take us even a little way along this road.

REFRESHER COURSES IN CLINICAL PEDIATRICS

AN EXPERIENCE IN POSTGRADUATE EDUCATION

AMOS CHRISTIE, M.D.

SAN FRANCISCO

Two fundamental pedagogic methods have guided all attempts at postgraduate medical education. Information developed at medical centers must be taken to the practitioner or the practitioner must be brought to the medical center for organized teaching in the medical specialties. For various reasons both methods have met with only moderate and in many cases no success. The reasons for this are (1) the expense of organization of postgraduate medical courses at the medical centers for the few physicians who are able to get away from their practice, (2) the expense to the physician student of remaining away from his practice for from four to six weeks and (3) in the bringing of medical school teachers to the practicing physician, the lack of understanding by the academician of the problems which confront the general practitioner. Because these methods of instruction are markedly different from those used for undergraduate medical students, many mistakes have been made in choosing teaching personnel. In other words, there has been a lack of experienced teaching personnel in this field. Finally, there has been lethargy on the part of the medical profession in recognizing the needs and benefits (value) of adequate postgraduate medical education.

With the passage of the Social Security Act in 1935, adequate funds became available for the first time to supply postgraduate teaching to the physicians of the United States. At the end of the fiscal year 1936-1937 (June 30, 1937) postgraduate training was provided with child and maternal health funds for local practicing physicians and dentists in thirty-four states. Of these states twenty-two reported a total enrolment of

From the Utah State Board of Health and the Curricula of Public Health and Department of Pediatrics of the University of California Medical School.

6,193 physicians in obstetrics and nineteen an enrolment of 5,009 physicians for courses in obstetrics.

It is now time to analyze the methodology in this teaching and to attempt to benefit by the experience of those who have been engaged in the work. It is my purpose in this paper to describe an experience in public health teaching which was conceived and carried out as an experiment in postgraduate education. The results are still somewhat intangible, but it is hoped that in a follow-up report some member or members of the Utah State Board of Health will write a critical analysis from their point of view. This may indicate what plan of approach was best in order that such a course may be more successfully repeated.

ORGANIZATION OF THE UTAH STATE BOARD OF HEALTH TO ADMINISTER MATERNAL AND CHILD HEALTH SERVICES

The state of Utah is essentially rural. The total population in 1930 was 507,847.¹ Of the twenty-nine counties all but five have a population density under ten persons per square mile.

There are 508 physicians in the state, with the number of persons per physician ranging from 719 in Salt Lake County to 2,703 in Tooele County. Under the state board of health the local health regulations are administered under the district plan. The state is divided into five health districts and one full time county health unit. Each district is administered by a full time health officer holding a certificate in public health.

The division of maternal and child health is administered from the state office by a director. A supervising nurse in this division administers the public health nursing program, working with the supervisors in each district and the public health nurses under a generalized nursing plan.

A nutritionist and an adviser on school health education are employed under the division of maternal and child health. Briefly the program of this division is to give advisory and consultation service to all local health groups and agencies, particularly in rural sections and sections of greatest economic need; to employ local physicians to conduct well baby, preschool and health conferences; to promote immunization against the communicable diseases; to promote better nutrition and health education in the schools, and to correlate these integral parts of the program with the dental and the crippled children's program wherever this is possible.

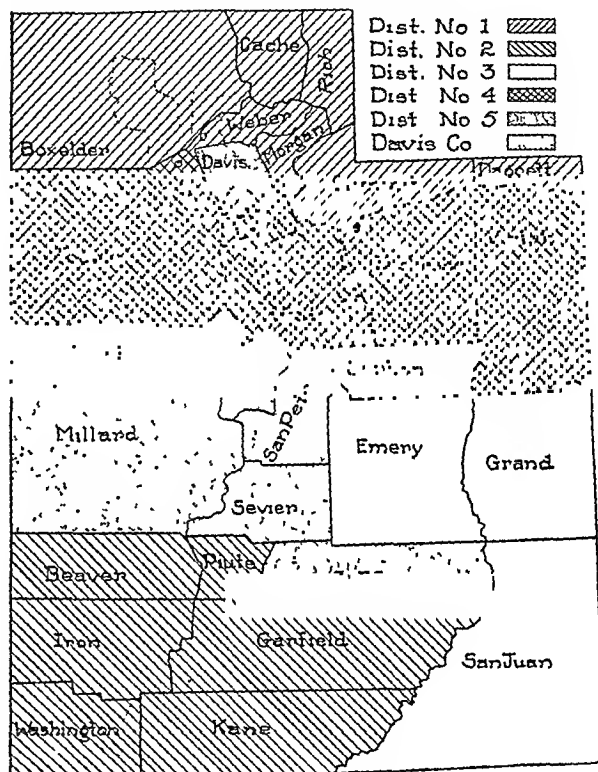
The well baby and preschool conference and immunization program are conducted under the supervision of the district health officers and the director of the maternal and child health division of the Utah State Board of Health by qualified local physicians, certified by the component society and approved by the state board of health. The state board of health pays local physicians at the rate of \$5 for the first hour and \$2.50 for each subsequent hour, with a travel allowance of 10 cents a mile beyond 5 miles. About \$19,000 was budgeted for this during the current fiscal year.

With this administratively sound program it soon became apparent that in many cases the local physicians were deficient in modern technics on the conduct of well baby conferences and factual information demanded by many parents. Consequently it was deemed advisable to conduct postgraduate courses in order to raise the general standard of these conferences, and in May 1938 I accepted an invitation from the Utah Board of Health

to spend two months in that state with this purpose in mind. The following program was developed with the sanction of the state medical society.

METHODS USED IN POSTGRADUATE TEACHING

In each case the details of the program were left entirely in the hands of the district health officer, and he used the services of the consultant as he felt would best suit the component medical societies. These societies were advised that the time allotted to each district would be on the basis of the number of physicians in the district. Consequently two weeks was spent in each of districts 1, 4 and 5, with one week each allotted to districts 2 and 3. The wisdom of this division of time will be discussed later.



Public health districts of Utah in 1938

There are three groups which the consulting physician meets in conducting postgraduate medical courses. The approach is quite different with each.

The Public.—This group is starved for accurate information concerning the scientific facts of maternal and child care. This is not so much the fault of the local physician as it is the result of fads and misinformation given to the public by their grandmothers and by lay magazines. Consequently education must be given; for example the details of adequate antepartum care and data as to the value of and time for immunization are frequently requested by parents. A common sense talk on child training and guidance is also in order. These are usually given at public meetings, and herein lies their greatest shortcoming. The information does not reach a sufficient number of people to make it worth while. The more intelligent people of the community are always present, but those who need it most are invariably absent. Several public meetings of this type were held in all but one district. They were attended by from fifty to 250 mothers, grandmothers and teachers and a few fathers. The talks given became standardized

1. Houston, D. C., and Hill, R. M. Health Conditions and Facilities in Utah, Utah State Planning Board, April 1936.

to include an introduction aimed at showing the need for cooperation with the district health officer and the scope of the general public health movement. This gave an opportunity to include in a subtle way such information as the need for antepartum Wassermann tests and venereal disease control in general. Infant feeding, including solid food additions and the need of and time for immunizations were discussed, and recent advances in these fields were outlined. Finally, about fifteen minutes was devoted to habit formation and child guidance work. This part of the talk invariably precipitated a number of interesting questions for further discussion. It was my feeling that this method was a very strenuous one for the consultant to repeat in each town, considering the relatively few people reached.

TABLE 1.—Sample Schedule for Dr. Amos Christie, Assistant Professor of Pediatrics, University of California Medical School, in Health District No. 4

July 11-July 23, 1933			
Date	Time	Place	Service
July 11	a. m.	Santaquin	Consultation with physicians
	p. m.	Vernal	
July 12	a. m.	Macser	Infant and preschool conference
	p. m.	Vernal	Consultation with physicians
July 13	a. m.	Mount Emmons	Infant and preschool conference
	p. m.	Roosevelt	Consultation with physicians
		Fort Duchesne	
July 14	a. m.	Upalco	Infant and preschool conference
	p. m.	Whiterocks	Consultation with physicians
July 15	a. m.	Provo	Return to Provo
July 15	p. m.	Provo	Consultant, crippled children's diagnostic clinic
July 16	a. m.	Provo	Consultant crippled children's diagnostic clinic
July 18	a. m.	Provo	Office administration
	p. m.	Provo	Office administration
July 18	a. m.	Provo	Consultation with physicians
	p. m.	Provo	Consultation with physicians
July 19	a. m.	Provo	Meeting of Utah County Medical Society and registered nurses
	p. m.	Pleasant Grove	Consultation with physicians
		American Fork	Consultation with physicians
July 20	a. m.	Provo	Office
	Evening	Provo	Consultation with physicians
			Pediatric clinic with Utah County Medical Society
July 21	a. m.	Provo	Consultation with physicians
	p. m.	Lehi and American Fork	Consultation with physicians
	Evening		Public meeting sponsored by Utah County Medical Auxiliary
July 22	a. m.	Provo	Office
	p. m.	Provo	District nurses' conference
July 23	a. m.	Provo	District nurses' conference

The radio should offer, whenever available, a means of getting the required information to more people. Its shortcomings, however, are obvious to all who listen to it. For programs to be effective the script must be professionally prepared, and such service is usually not obtainable.

This medium, however, was tried in a district where a small radio station had an outlet of a possible 27,000 listeners. A time (from 5 to 5:30 p. m.) was arranged, and two half hour broadcasts were given. The subjects were "Diet and Growth in the Young Infant" and "The Premature Infant." The scripts were prepared with the idea of the listener's interest, and after each ten or twelve minutes a woman's voice was interjected to ask specific leading questions. In this way detailed information as to additions of solid food and the need and reason for cod liver oil, for example, were covered. The same voice, impersonating a typical mother, also asked pointed questions and was answered in conversational style concerning the prophylaxis of communicable diseases.

This method would seem more logical than the public meeting for reaching the public and would allow the physician more time for contact with the local physicians.

The Physician.—Three methods were used in reaching the medical profession: (1) the personal visit to the physician's office, (2) meetings of the component medical societies, at which clinics were held and talks given, and (3) attendance, on invitation, by from two to four physicians at a properly conducted well baby conference. The third method was most difficult, yet successful.

It is problematic which of the three methods can be used to the greatest advantage and which should precede the other. If a satisfactory meeting with good attendance can be arranged with the county medical society, this offers the greatest possibility of results because all further teaching methods to be used are dependent on the initial contact. The consultant must give a tactful and sincere presentation of what he is attempting to accomplish. It must be followed by a talk (not a lecture) on one of several subjects of practical value to the practitioner. I myself have discussed such subjects as recent advances in sulfanilamide therapy and some aspects of congenital syphilis. These subjects were of topical interest at the time and of definite value to the practitioner. The latter subject also allows for the opening of a discussion of adequate antepartum care.

In one county such a didactic talk was followed by a clinic. This included the presentation in academic style of from five to seven cases which were of diagnostic, prognostic and therapeutic interest. With overemphasis on suggestions of practical value, the way is open for pleasant and adequate contact with physicians in their own offices.

Office visiting is generally unsuccessful unless the practitioner has spent some time and thought preparing for the interview. Frequently he does not realize his problems or is reluctant to reveal his apparent inadequacy in a discussion of recent advances. The most subtle methods must frequently be used to draw him out. This was accomplished in some cases by an informed third person asking leading questions.

These personal interviews are of great value to physicians, and, if the physicians can be encouraged to ask their problem patients to come to the office for consultation, much teaching can be accomplished in an hour and a half or two hours. The consultant should be prepared to visit the homes of the patients, and a diagnostic bag is a minimum requirement.

There is a small group of older physicians who desire to show their complete ability to handle all problems pertaining to the diseases of men, women and children and who do most of the talking. No method was found to combat this type of individualism, and I am convinced that only a successful contact or repeated visits in a meeting of such a physician's colleagues will engender the necessary feeling of cooperation for a successful follow-up. It cannot be too firmly emphasized that in all relations with fellow practitioners the entire tone of the meeting or personal interview should be so conversational as to break down any prejudice against the visiting professor, whose ideas might be too unpractical and academic to be of use to the practitioner. Material must be presented with the attitude of "here it is if you can use it."

It should be remembered that the primary purpose in Utah was to raise the standards of well baby conference work, for which state and federal funds were being spent liberally.

Most practicing physicians who have been out of medical school more than ten years do not realize the tremendous educational value to the mother of this type of conference and have not kept up with the demands on the part of parents to know the fundamentals of habit training or the striking clinical points, such as rickets and anemia, which the physician should observe in such an examination. The conduct of the well baby examination is unique, and yet it is only with considerable difficulty and tact that it is possible to make the older physician receptive to this type of demonstration. Care should be taken in such teaching not to have too many cases. From eight to ten are sufficient for a two and a half hour clinic, and when they are carefully chosen by the public health nurses much can be accomplished. The importance of history taking, the value of reemphasis to the mothers and the fundamentals of infant feeding and solid food additions may be brought out. The value of prophylaxis against communicable diseases must be emphasized, and mothers should be encouraged to discuss their children's habit problems.

It is my feeling that herein lies the major value of the well baby conference and that an excellent bit of teaching can be given by efficient demonstration. The smile of satisfaction on the part of the mother whose questions have been adequately answered and whose baby has been completely examined will be sufficient evidence that the well baby conference to be successful must be more than a baby show or a weighing by the nurses. It must be conducted by a physician qualified to interpret disease at its outset and capable of making an examination sufficiently complete to promote confidence. He must be able to handle questions the answers to which are in any government bulletin on infant care or child management and are not the magic of pediatricians only.

The Public Health Personnel.—Factual information given to the health officers and public health nurses can be of considerable value to them in their future contacts with the medical profession. Therefore an association of the consultant with the public health officer is of importance in refresher courses on recent advances in maternal and child health, bringing communicable disease control and immunization methods up to date. There is no place in rural health work for the "arm chair health officer." The best health officer is first a good doctor and then a health administrator and educator. In other words, the health officer who will roll up his sleeves and use his training and knowledge of practical clinical problems to assist the practitioner will promote his program further and faster than the desk sitting type of health administrator. The schools for the training of rural health officers will do well to recognize this fact.

The district health officer and the public health nurse are the keystone of any program, and any association by them with the consultant is desirable. The health officer is the one to introduce the consultant to the physicians, as such an introduction should improve his future contact with them.

In each health district a nursing conference was called on the last day on which the consultant would be in that district. Discussions of local problems pertaining to the program were carried out openly and frankly, and considerable good work was done. At many of these joint meetings of public health personnel, social workers were invited and principals of schools attended. This presented an excellent opportunity for actual case

studies to be shown. It was possible to demonstrate where better correlation of existing facilities would lead to greater efficiency in the broad program.

Two sample schedules made out by district health officers are shown in the accompanying tables. These were arranged through the cooperation of the secretaries of the medical societies and were circulated to all physicians. In this way any physician could participate in all or parts of the program.

THE EDUCATION OF THE CONSULTANT

It has been suggested that many mistakes have been made in postgraduate medical education by a teaching personnel untrained in the technics of teaching persons whose very choice of the medical profession spells "rugged individualism." It would therefore be unfair to omit in such an analysis as this a discussion of the ways in which my eyes were opened to the needs and local conditions confronting practitioners and rural health officers. It was possible to observe rural health

TABLE 2.—Sample Schedule for Dr. Amos Christie, Assistant Professor of Pediatrics, University of California Medical School, in Health District No. 5

Date	Town	Service
July 26	Nephi	Consultations with physicians
July 26	Mount Pleasant	Public address, 8 p. m.
July 27	Fairview	Consultations with physicians
July 27	Ephraim	Consultations with physicians
July 27	Manti	Consultations with physicians
July 28	Spring City	Infant conference, 9:30 a. m., relief society room
July 28	Mount Pleasant	Medical meeting, 8 p. m., Dr. Madsen's office
July 29	Gunnison	Infant conference, 10 a. m., town hall
July 29	Chester	Infant conference, 2 p. m., schoolhouse
July 29	Manti	Medical meeting, 8 p. m., schoolhouse
July 30	Salina	Consultations with physicians
August 1	Annabella	Infant conference, 10 a. m., relief society room
August 1	Yenlee	Infant conference, 2 p. m., church house
August 1	Richfield	Medical meeting, 8 p. m., Dr. Lowe's office
August 2	Bicknell	Infant conference, 10 a. m.
August 2	Sea	Infant conference, 2 p. m.
August 3	Seipio	Infant conference, 10 a. m.
August 3	Fillmore	Public address, 3 p. m., first ward church
August 4	Oak City	Infant conference, 10 a. m., church house
August 4	Hinckley	Infant conference, 2:30 p. m., grade school
August 5	Eureka	Infant conference, 10 a. m., school
August 5	Manti	Talk to welfare group, 2 p. m., court house

administrative problems which had been discussed in the classroom under actual test in the field. This practical experience should enable one to temper and even change many of one's theoretical ideas in the future. An example is my conviction that well baby conferences in rural communities must be open to all socio-economic groups. I am certain that there is no place in rural health work for well baby conferences limited to indigents.

Much was learned from rural practitioners in the way of clinical pediatrics. A notable instance was the experience of seeing eight patients with Rocky Mountain spotted fever. Colored photographs of rashes were obtained which will be of inestimable value for medical school teaching, and observations were made on the value and limitations of the vaccine prepared for this condition.

There was an opportunity to study the cause and clinical picture of pseudohypertrophic muscular disease, which seemed to have a high incidence in the state.

Other unusual educational opportunities presented themselves. Observations were made on the mottled tooth enamel due to the high fluoride content of the water of certain isolated areas in Utah. The seeming geographic and climatic incidence of rheumatic fever, previously described by Paul, was also noted. The high

incidence of thyroid enlargement in school children and of rickets in certain communities and the sharply localized areas of tremendous tonsillar hypertrophy were a constant source of interest and education.

A cooperative medical plan started in an isolated county whose people were without the services of a doctor for four years was observed in operation and studied with interest.

SUMMARY

Throughout these experiences in the postgraduate teaching field, the several approaches noted were evaluated with the idea of setting up a better program if it was to be repeated under somewhat similar circumstances in another community. Certain opinions were gained which should be of value in the repetition of an organized program in postgraduate medical education.

The practitioner has developed a tremendous responsibility to his patients. He cannot afford to leave his community for refresher courses for as long as two weeks. The people have learned to depend on him to a point where they will not accept a temporary locum tenens for even that short period. The practitioner feels this responsibility keenly and, despite any possible changes in the practice of medicine which may result from the changing times, this patient-doctor relationship must be preserved. It is for this reason that postgraduate medical education must be taken to the doctors.

I would suggest that this may best be done by a full time physician, whom I choose to call a circuit rider. This term has the connotation of the lawyer who pioneered the West, as did Abraham Lincoln in his day. A full time person, well trained in a branch of clinical medicine and serving for not longer than two years, could learn much to take back to his medical center and by reason of his academic training could keep the practitioners in the outlying districts well up on his subject. By traveling from place to place, by knowing local conditions and by possessing factual information and tact, he might be able to raise the standards of medical practice to a high degree. Herein may lie the future of postgraduate medical education.

There should be a well defined purpose before such a program is initiated, and this should be kept in mind at all times. If this purpose is to raise the standard of well baby conferences, all efforts should be directed to this purpose, at the sacrifice of lay education, nursing education or the solving of individual medical problems of the physicians.

The greatest need for postgraduate medical education or refresher courses in pediatrics is felt by men who have been away from medical school more than five years. More time must be allowed for those rural areas where it is impossible for the physicians to leave their practices for refresher courses.

This brings up the question of division of time, and a better arrangement should be sought than time per number of physicians in any one area. I would suggest that a short course of lectures does not reach the physicians who need the instruction most. Two weeks is insufficient for the accomplishment of anything constructive in any one area or district. One month or, preferably, two months should be the minimum requirement. I believe that the consultant should acquaint himself first with local conditions and the personalities peculiar to the area. In this way he can accomplish more, particularly if the available time is not spread too thinly over too wide an area.

Choosing the person who is to act as consultant or instructor is most important, and time, thought and energy should be expended on obtaining the best possible physician. In other words, for a well defined purpose a clinical instructor may be a better selection than a professor. Graying hair will stand in good stead for the consultant.

It is a well known fact that one of the great deficiencies in the training of health officers has been the lack of adequately trained teaching personnel with an understanding of postgraduate educational technics to give these men the real benefit of the progress in public health. It would be well to spend some of the available funds in the teaching of teaching personnel. I believe that the training of health officers for rural areas should be directed more along clinical lines. The promotion of a program is best accomplished by a health officer who, by reason of his knowledge of clinical medicine, can be of positive assistance to the practitioner in his clinical problems.

It would seem that the extension of education to the people has given rise to the national health movement. There is no evidence of an ebbing tide. It is my hope that this record of an experience in postgraduate education will stimulate further reports so that inadequacies may be realized and technics sought for remedying them.

THE COMMUNITY HOSPITAL

WHAT IT SHOULD BE

BARRY C. SMITH

General Director, the Commonwealth Fund

NEW YORK

In considering this subject—particularly at the present time when the question of great expansion of hospital facilities at governmental expense is under discussion—the matter of definitions appears of outstanding importance. Just what is meant by the term “hospital” and just what is a “community hospital”?

Is a hospital simply a building where the sick may be housed and presumably cared for by one or more members of the medical profession or is it, to be worthy of the name, far more than that?

In *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* of June 11, 1938, it was stated that in the entire United States there are “but thirteen counties no part of which is within thirty miles of a registered general hospital.”¹ This statement presumably was intended as anticipatory evidence that the need for additional hospital facilities, as later set forth by the Technical Committee on Medical Care in Washington last July, was exaggerated, and the argument was buttressed at the very end by the statement “There may be some localities in which hospital facilities are needed. However, the Commonwealth Fund, which for the past ten years has been awarding hospitals to communities which seemed to be able to maintain such institutions with proper standards, has thus far made eleven awards.” This statement is but a weak buttress, for, while it is true that only eleven awards were made, the reasons were, first, financial limitations, each hospital, with nurses’ home and equipment, costing the Commonwealth Fund on the average about \$235,000; and, second, the fact that the staff of the Commonwealth

Read before the Thirty-Fifth Annual Congress on Medical Education and Licensure, Chicago, Feb. 13, 1939.
1. Distribution of Hospital Service, Current Comment, J. A. M. A. 110: 2013 (June 11) 1938.

Fund's Division of Rural Hospitals, for a minimum period of five years and frequently for a longer time, has found it necessary to devote much time and attention to the establishment and maintenance of operating standards—matters with which the rural community is usually reasonably unfamiliar and which have some bearing on the importance of the definition of a hospital above referred to. Even the fact that a community "seemed to be able to maintain proper standards" is far from a guaranty that it will do so or even knows how. Certainly the fact that only eleven awards were made bears little relation to the need for additional rural hospitals or to the number of applications received, which have run into the hundreds.

Again, a "registered hospital,"² says the American Medical Association, means one concerning which "evidence concerning irregular or unsafe practices . . . has not come to the attention of the Council on Medical Education and Hospitals." On this basis, 6,128 hospitals are on the latest registered list and 617 are omitted.³ Members of the staff of the Commonwealth Fund have visited a good many registered hospitals which in our opinion are anything but assets to their communities and which in some cases are little if anything more than rather badly run boarding houses for the sick, with little and poor equipment and with questionable medical or surgical service. Many of these are very small; many are proprietary, sometimes operated by physicians of doubtful education and experience, in which some odd medical procedures are carried on.

Let me hasten to say that I am not indulging in that form of indoor sport, which is at present quite popular, of damning the American Medical Association. On the contrary, while it may perhaps be considered, with justice, somewhat overly conservative, it has among other valuable achievements done a great job in improving the standards of medical practice and of medical education, and in protecting the public. It has also done much of value in the hospital field, and since it can scarcely be expected to investigate on the ground every two-by-four establishment that chooses to call itself a hospital, perhaps we of the Commonwealth Fund staff and others familiar with hospitals are to blame for not calling "irregular and unsafe" practices to the attention of the Council on Medical Education and Hospitals; or, possibly a wiser policy would be to register only hospitals known to be regular and safe rather than those not known to be irregular and unsafe.

However, lest I still be misunderstood, let me turn momentarily to another side of the picture. Within the last few months an individual who is greatly interested in the hospitalization phase of the National Health Program proposed at the Washington Conference last July argued at some length, in conversation with me, for the establishment of very small (eight to twelve bed) hospitals—"crossroads hospitals." I believe this person called them—to be located in sparsely populated and very poor rural districts, to be "reasonably protected from fire" and equipped with a "moderate x-ray and simple laboratory." While in my judgment reasonable protection from fire is obtainable, when one is talking of hospitals, only by absolutely fireproof construction, and while I was not and am not particularly clear as to what a "moderate x-ray and simple laboratory" might be, nevertheless, admitting these points as possible for the sake of the argument, I inquired how

in such a hospital, in such a community, it would be possible to supply the necessary medical and surgical service of really good quality, the technical service for the operation of the alleged x-ray and laboratory, satisfactory graduate nursing personnel, and the various other things which go to make up a hospital worthy of the name. To my complete astonishment the answer to this question was "All that is really needed is a good surgeon." Asked how such a good surgeon could be obtained in such a community where usually one is not likely to be found, the answer was that he could be imported. In my judgment, really good care for the patients in a hospital requires a number of other branches of medical service of high quality in addition to surgery. Nor does it seem to me likely in a community so sparsely settled and so poor in resources that no good surgeon has ever been attracted there, that one could be imported and persuaded to stay there even by a government subsidy, considering the opportunities for good surgeons in more pleasant regions. Again, the advocacy of such a plan for hospital expansion makes important the definition of a hospital.

A GOOD COMMUNITY HOSPITAL

If I may venture to say so, without being too obvious, it would seem to me that an adequate definition of a hospital which would render a worth while service to a given rural community involves two parts: the first relating to the building and its equipment, the second to the quality and type of service rendered within that building.

The building should be absolutely fireproof, whether large or small. It should be equipped not necessarily for every service which the best urban medical centers are prepared to render but certainly for every service which a reasonably competent medical profession is able to provide and without such equipment cannot provide satisfactorily. Such equipment should certainly include first-class clinical laboratory facilities, an x-ray plant adequate for diagnostic purposes, but not for therapy unless there is a physician trained to administer it, properly lighted, ventilated and equipped operating and delivery rooms, necessary facilities for the preparation of food including special diets, an adequate heating plant, reasonably comfortable wards and rooms—all these things to the extent that you are all familiar with—together with the best arrangements possible to emphasize what may be termed the safety factor, such as is provided by well separated operating and delivery rooms, isolation facilities for contagious cases, provision for prevention of cross infections, and so on. Certainly such conditions as have been recently related to me concerning a small "hospital" containing five patients in close proximity, three postpartum cases, one of scarlet fever and one of poliomyelitis do not make possible the type of provision indicated. One might add as a desirable if not essential quality such planning as will make for convenience in careful and orderly service, with absence of unnecessary noise and fatigue. The list could be enlarged.

Given such a plant, of what value will it be? That will depend entirely on the quality of those who are available to utilize the facilities and render the necessary service—the physicians and surgeons, the nurses, technical assistants for the x-ray and laboratory, even the cook.

Such a plant is largely useless without competent physicians, surgeons and other personnel. Nor can the best of physicians and surgeons serve their patients to good advantage without first-class facilities. Granted

2. Hospitals Registered by the American Medical Association, J. A. M. A. 110:986 (March 26) 1938.

3. Summary of Hospital Data, J. A. M. A. 110:959 (March 26) 1938.

that there are cases on record of difficult operations successfully performed on the kitchen table with the most primitive appliances, it is the successful ones, I suspect, that we hear about and not the failures—or the unnecessary deaths.

This, then, would be my definition of a hospital: a fireproof, properly equipped plant (whether small or large) with a medical staff and other personnel competent to render the service made possible by such a plant. With full realization that good hospitals vary somewhat in the degree of their excellence and that the competence of the physician is a relative matter, even so there is a minimum in terms of plant, equipment, medical staff and personnel below which a hospital ceases to be an asset and in my judgment becomes a liability—even a menace to the people of a community—and I fear that the descent below that minimum is far more common than is generally known.

If this definition is so far correct or even approximately so, it requires to be considered in determining the need for additional community hospitals and of how best to meet that need.

A community hospital is simply a general hospital which is prepared to serve the people of its community without regard to race, creed or financial status. It must be prepared to render a large amount of free service. Either a private voluntary hospital or a public, tax-supported one may render such service of high quality. Few proprietary hospitals render any great amount of free service or provide opportunities for hospital service to more than a small fraction of the physicians of the community; and few therefore can qualify as community hospitals. The Commonwealth Fund in its rural hospital program has devoted its attention to the type of hospital organized as a corporation not for profit, governed by an elected voluntary board and conducted by agreement in accordance with accepted standards. This is not to say that a public hospital cannot be operated as a community institution with equally high standards, provided—and this is not always easy—political control is avoided.

A community hospital of the type I have been attempting briefly to indicate should be of what size and serve how large an area? These two matters are somewhat interrelated. Such a hospital must make provision for patients of both sexes, of different races (certainly in the South), for different types of conditions which require to be separated. With the provision of such bed facilities and of the various types of equipment and of technical service, it has appeared from our experience that twenty-five beds is an irreducible minimum to provide what the various patients require and do it at reasonable expense. From forty to fifty beds has appeared a better minimum, permitting a wiser and more careful segregation of patients and a lower patient day cost. Nor does there appear any reason why such a hospital should not serve a population within a radius of 25 to 35 miles regardless of county lines. With the improvement of roads and transportation facilities that has, again in our experience, proved entirely practicable.

SPECIAL PROBLEMS

What then of the various sparsely settled and very poor areas—such for example as may be found in Catron County, New Mexico? This county, of some 7,000 square miles, had a population in 1930 of 3,283; in 1931 it had one physician. If such a hospital as I have described should be built there, how would it be staffed, how many occupants would it have? A circle

of 35 miles radius in such a county would have a population of less than 400. Build a hospital as small as you like, run the cost of operation per patient as high as you like, still in such an area how can medical, nursing and other technical service of competent character be obtained and retained? I do not know the answer. Perhaps there is no satisfactory answer; perhaps it would be better for the patient to be taken long distances to a really good institution rather than to risk the poor quality of care which is frequently all that is available or can with practicability be made available in some very poor and sparsely settled districts.

The experience of the Commonwealth Fund would indicate, however, that there are many rural districts where a good community hospital of from forty to fifty beds could serve a reachable population group of sufficient size, where the nucleus at least of a satisfactory medical staff is available and other trained personnel are obtainable. We have assisted in providing such plants in eleven instances in almost as many states. We believe that they have been of great service and we know that many other similar districts are to be found.

In choosing the location for such hospitals it is important not only to avoid overlapping service areas and consequent unnecessary duplication of facilities but to relate the location of one hospital to that of others and so far as possible to key the community hospitals with the facilities of large urban medical centers and teaching centers. Such arrangements when practicable will create the possibility of informal affiliations, which contribute much in the way of consultant service, educational opportunity and the provision of skilled care for certain patients whom even a good community hospital may not be able to treat adequately. To hospitalize a given state will require careful study and planning if such advantages are to be secured.

I have been considering the hospital in this paper only as providing proper care for the sick. The value of a really good community hospital as a means and channel of education of physicians, nurses and of the public at large has not been dwelt on. In the hospitals with which the Commonwealth Fund has been concerned, the value of organization of the medical staff, of the contact and consultation between physicians, of regular staff meetings for discussion of cases and methods, of consultant pathologic service, of more formal medical institutes and clinical demonstrations, of postgraduate fellowships, of the constant interchange of ideas—these values I can only mention and refer you to a paper by Dr. Lester J. Evans,⁴ medical associate of the Commonwealth Fund, read before this body a year ago. As Dr. Evans said, "Such a hospital makes its contribution to education simply by being the kind of hospital it is. In it the doctor finds opportunity for professional growth by learning from what he does and by hearing about what others do. The educational value of this experience is what the doctor makes it."

There is need for many more such hospitals in the United States. No hospital of lesser quality, in my judgment, is worth the having or worth the cost. And it is worth while to note and ponder the following statement by the Catholic Hospital Association:

The Association is sympathetic with the plan of providing hospital facilities in those areas of the country in which such facilities are not found at the present time, or in which hospital facilities are relatively inaccessible. It cautions, however, against a precipitate and indiscriminating multiplication of hospitals.

4. Evans, L. J.: The Rural Hospital, J. A. M. A. 110:945 (March 26) 1938.

and would recommend that the erection of new hospitals . . . be not stimulated except when a prudent provision of the hospitals' operation and when, furthermore, an adequate staff, medical and administrative, can be provided, with due attention to both the economic and the professional viewpoint.⁵

Those words are in my judgment absolutely sound. Provision of adequate funds to erect, equip and operate community hospitals where they are needed, where they will be utilized, where they can be operated with reasonable economy and where adequate medical and other professional service is available is much to be desired. But intelligent planning, thoughtful foresight, wise administration, physicians of first quality, trained in modern medicine, and other trained personnel—these things are prerequisite to the successful expenditure of funds, large or small. No medical or health ideal, so far as hospitalization is concerned, is obtainable, nor is any measurable advance in that direction obtainable, in any other way.

THE RELATION OF ANESTHESIOLOGY TO MEDICAL EDUCATION

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This paper has been written to emphasize the need for undergraduate and graduate instruction in anesthesiology and to describe ways and means of its accomplishment.

Recent advances in medicine have widened the scope of anesthesiology to include problems which were only dreamed of twenty-five years ago. The insistence of patients on complete abolition of pain has made more prevalent the use of depressant drugs and the administration of such drugs in larger doses. There results a necessity for clinicians especially trained in the administration of pain-relieving drugs and the management of depressed states. For reasons too numerous to discuss fully here, the medical profession finds itself in the anomalous position of having an obvious lack of clinicians trained in anesthesiology and having scant provision for such training in our medical schools and hospitals.

OBJECTIONS

The following six arguments against clinical instruction are so frequently advanced as to warrant reference to them in some detail: 1. A sufficient number of physicians will not be interested. 2. Present day excellent instruction in the basic science departments makes clinical instruction in anesthesia superfluous. 3. "A little knowledge is a dangerous thing." 4. The medical school curriculum is already overcrowded. 5. The economic adjustments necessary for instruction and the employment of physicians specializing in anesthesia are impossible. 6. The administration of anesthetics is an art, not a science, and as such may be done quite as well by one without scientific training. Each of these six opinions is probably honestly held by some persons and should be honestly answered.

1. The impression that a sufficient number of physicians will not be available is erroneous. Young doctors will show interest in proportion to the inspiration which is imparted to them. The practice, so common at present in many of our medical schools, of delegating not only the technical administration of anesthetics but also the clinical teaching to persons without professional qualifications does not stimulate the interest or respect of the medical student and hospital intern. Conversely, it is noticeable that applications for residencies in anesthesia in hospitals come in higher proportion from Canada and from districts in this country where the administration of anesthetics is limited to graduates in medicine. In centers where professional training has become recognized, there is ample demand for positions. Furthermore, the professional and financial success of others in the specialty adds to its appeal. Recognition of the anesthesiologist as a specialist in certain phases of medicine and therefore as a valuable consultant to other departments adds to the attractiveness of the specialty. Such recognition has been withheld only because of improper teaching and lack of example.

2. The contention that all necessary instruction in anesthesia is provided by good courses in physiology, biochemistry and pharmacology can be based only on an entirely inadequate conception of the clinical importance and relationships of anesthesiology. Careful consideration will show that clinical interpretation and application of basic science knowledge is admittedly necessary in every other branch of medical education. Anesthesiology deserves no less clinical interpretation. It deals with the management of patients acutely depressed by drugs, with artificial respiration, resuscitation, the maintenance of free air passages, the administration of oxygen and other gases, and with the recognition of evidences of oxygen want and carbon dioxide excess, to mention but a few of its ramifications. Many circumstances of depression due to accident or illness bring about changes in the body similar to those accompanying anesthesia. In the medical or surgical wards, however, such disturbances take place over a period of hours or often days, whereas in the operating room they develop often in a matter of minutes and can be followed through cause, development and treatment in a single teaching period. Here then is the ideal place to teach these fundamentals to the student. In later practice, whether he becomes a specialist or a general practitioner, he will have daily use for this knowledge.

3. The dean of a great school has offered as an excuse for complete absence of clinical instruction in anesthesia from his curriculum the quotation "A little knowledge is a dangerous thing." This argument is quite as applicable to the clinical teaching of surgery or any other portion of medical practice. The argument has two obvious fallacies: 1. Lack of clinical teaching will not prevent graduates in medicine from considering themselves competent to deal with matters of anesthesia. Thus by its own standards the argument fails. The minimum of knowledge is already assumed by the medical graduate; therefore he is dangerous; therefore the school should amplify his knowledge as much as possible, at least to the extent of showing him his limitations. 2. The fundamentals of anesthesia are matters of everyday application in every branch of medical practice and therefore cannot be omitted. Training in anesthesiology will amplify a little knowledge gained in other departments and make the young graduate a safer rather than a more dangerous practi-

⁵. Hospital Progress 19: 387 (Nov.) 1938.

From the Department of Anesthesia, University of Wisconsin Medical School.
Read before the Thirty-Fifth Annual Congress on Medical Education and Licensure, Chicago, Feb. 14, 1939.

tioner. Whether students are to administer anesthetics or not, they should go out from medical school prepared at least to care for patients while they are subject to drug depression, sometimes induced by an overdose. Physicians must in all justice be possessed of sufficient knowledge of the clinical use of anesthesia to recognize the good from the bad. They should be able to save a life by reestablishing a patent airway or performing efficient and safe artificial respiration when necessary. That some recent graduates are dependent on the fire or police department or on their boy scout manuals for artificial respiration is a serious reflection on present day medical education.

4. That the curriculum is too crowded to include clinical anesthesiology is more apparent than real. Even without formal lecture periods the student, patient and anesthetist can constitute a teaching unit in ward or operating room. When the department was established at the University of Wisconsin twelve years ago there appeared to be no time available for lectures. However, the first year one hour was assigned, the next three hours and the year following six hours. With the present arrangement, to be described later, the curriculum seems no more crowded than twelve years ago. It is apparent therefore that, once the need is appreciated, available time will be found.

5. That no money is available for the establishment of a department of anesthesia on a professional basis may temporarily be true in some institutions. Medical progress modifies budgeting and may involve an added outlay for equipment, replacements and other changes. A well qualified director of anesthesia, who is capable of filling with credit the chair in the faculty of the medical school, should command an income comparable to that of other members of the staff. In the light of the increased scope of the service rendered, necessary budgetary adjustments are insignificant. In some institutions ill advised purchases, lack of attention to home construction of apparatus, and waste of materials have increased costs. With proper reorganization certain economies may result. The change has actually been made in some institutions with a definite financial saving within the first three year period.

6. There can be no question that the administration of anesthetic drugs is an art just as is the skilful handwork of the clever surgeon, but it is an art in the application of fundamental principles of basic science. The minute to minute necessity for the utilization of knowledge of physiology, of pharmacology, of biochemistry, of anatomy and even of physics is appreciated by every keen anesthetist. The rapidity with which changes may occur and the need for accurate thinking and prompt judgment are not exceeded elsewhere in medical practice. The trained anesthesiologist is a scientist applying scientific knowledge of respiration and circulation both in the operating room and in the wards. Art in anesthesia, to be safe for the patient, must be based on a scientific foundation quite as broad and fundamental as is the foundation for the art of surgery.

CONTRIBUTIONS TO GENERAL MEDICAL EDUCATION

Whatever type of practice they expect to pursue, young physicians must go out with sufficient knowledge of clinical anesthesia to recognize its limitations and its possibilities. Somewhere in the medical curriculum, students must be provided the opportunity to correlate the basic pharmacologic facts regarding depressant drugs with their clinical application. They must be

taught the proper management in the wards of patients under the influence of such drugs. They must recognize the physiologic and biochemical disturbances which accompany the depression of respiration and circulation as well as have a knowledge of the measures and technics available to correct such disturbances. Such matters can be taught more effectively and more easily during the study and care of the surgical patient before, during and after anesthesia than at any other time.

A series of combined didactic lectures and clinical demonstrations on narcotized patients can be utilized for undergraduate teaching. A laboratory course in surgical technic can be utilized to emphasize the more fundamental principles and to permit experience in open drop technic. During a short period of the fourth year and of the internship the student may serve with the anesthesia department, gaining knowledge through discussion as well as practical experience.

Emphasis is laid on the side effects both of the drugs and of the technic. The principles on which depend the choice of sedative and narcotic drugs and their dosage are discussed, and their administration is demonstrated. Methods of maintaining patent air passages and the treatment of depression are practiced. Indications for and methods of administering pneumothorax are demonstrated and discussed. Various supportive treatments of depression by rectal, subcutaneous and intravenous routes are discussed and technics of administration demonstrated. The causes and treatment of acute respiratory derangement accompanying and following anesthesia are discussed and demonstrated when possible. The physiologic principles of technic for obstetric pain relief and the physiologic and biochemical balance in the mother as an influence on the condition of the child at birth are stressed. During the administration of pain-relieving drugs to women in labor, the anesthetist has an ideal opportunity to impress on students the fundamental physiologic interrelationship between mother and fetus and the influence which he may exercise on the condition of the fetus by the judicious or injudicious administration of gases or other drugs to the mother. The physical state of patients before operation and their postoperative course in the light of the effects of drugs is studied and recorded by both the senior student and the intern. Such a course of supervised instruction and experience we believe essential in the general medical education of every young physician.

In anesthesiology, as in almost all phases of teaching, service and instruction go hand in hand. Consciously or unconsciously, the student imitates the instructor's service to others and emulates his success. Seeing the anesthetist approach patients with judicious recognition of the problems in medicine and psychology which they present, the student will realize the seriousness of assuming responsibility for the patient's life while administering drugs the therapeutic doses of which range from 65 to 90 per cent of the lethal doses. The student observes that the patient's welfare is the constant concern of the anesthetist and that by means of frequent observations and accurate detailed records the anesthetist can note minute to minute changes, can interpret and assess their significance, can adjust his own course accordingly and can consult with the surgeon should circumstances require a change in the planned procedure. If the student should become a surgeon, he will benefit by knowing to what extent he may rely on the cooperation and advice of the anesthetist.

and to what extent he may feel free to attend to the operative procedure without being concerned about the anesthesia. If the anesthetist is qualified to assume complete responsibility for the general condition of the patient, the surgeon's attention may be devoted entirely to teaching and carrying out the surgical procedure, more time may be spent allowing the surgical neophyte to obtain some practice and the young surgeon may be permitted more safely to take the full responsibility for many surgical procedures.

SPECIALISTS

One can hardly start a discussion of the training now required to qualify as an anesthesiologist without first commenting on the debt the profession owes to the many self-taught specialists who have pioneered in this neglected field. Starting with the object of providing patient and surgeon with the best available conditions during operations, many physicians have, through years of service, coupled their extensive experience with a scientific attitude of observation and inquiry to build the practice of anesthesiology into the science it is today. They have contributed the numerous developments which now make intensive training almost obligatory before a younger man can call himself their equal. That these self-taught anesthesiologists still constitute the backbone of the specialty is evident from the fact that only three of the nine members appointed to the American Board of Anesthesiology have qualified by way of formal postgraduate training.

With the larger conception of anesthesia service coming to recognition at this time, it would seem that within a few years any hospital of 100 beds or more with an average proportion of surgical work will need the full time of at least one specialist in anesthesia to perform the various duties connected with a complete service. The qualifications of such a specialist should equal those necessary for certification by the American Board of Anesthesiology, an affiliate of the American Board of Surgery. To qualify for the examination of this board at present, a physician must be of good moral character, of ethical standing, a member of the American Medical Association, licensed by law to practice medicine, a graduate of a grade A medical school, a former hospital intern and a specialist of at least four years' standing, two years of which should have been spent in intensive graduate study. After 1941, in the opinion of the board, the special preparation should consist of six years' specialization, three of which should be spent in thorough training "in the clinical phases of anesthesiology and in anatomy, physiology, pharmacology, biochemistry and other basic sciences which are necessary to proper understanding of the problems involved in the specialty of anesthesiology." Such instruction must have been received in institutions approved by the Council on Medical Education and Hospitals.

The recent rapid increase in the number of institutions offering adequate training and the number and qualifications of the applicants are most encouraging. It may be asked what is to become of these physicians after they finish their training. Placing young specialists in the United States has so far not proved difficult. The demand on the part of medical schools and large teaching hospitals has exceeded the supply. Eventually a saturation point of teaching positions will of course be reached. However, several obvious circumstances will bring about satisfactory adjustments.

Established departments tend to expand in scope, requiring an increasing number of associates and assistants. Many men are intensely interested in anesthesiology but not in teaching as a major interest or in research activities. Although they are quite as capable as the teachers, their preference is for private practice in hospitals without university affiliations. The minimum amount of instruction to the house staff necessary in such hospitals is given willingly by these men just as it is by attending staff members in other specialties. The fact that hundreds of physicians who had little or no formal training in anesthesiology, either graduate or undergraduate, have succeeded in such practice in the past proves that there will be abundant need for well trained practitioners in the future.

RESEARCH

It should be emphatically stressed that research is merely a by-product of a department of anesthesiology. First and foremost should come good service to patients, then teaching and finally, when these are assured, research.

The physical signs induced by, the character of the response to, and the effective dose of anesthetic and depressant drugs are not the same with animals as with man, yet the laboratory is the logical starting point for any physiologic or pharmacologic investigation which may ultimately receive clinical study and final evaluation. Several recent advances in anesthesiology serve to emphasize that cooperative effort between the laboratory worker and the clinician is essential. In addition to purely clinical research, the anesthetist is capable of contributing much toward the satisfactory amalgamation of laboratory and clinical data through discussion of the planning of experiments involving anesthesia and cooperative assistance in the laboratory, aid in checking the results of animal experiments with human beings, offering to the basic science departments the opportunity for clinical observation of their problems, carrying clinical problems to the basic science experts for their consideration and investigation, and independent investigations. The control of the patient essential to proper anesthesia provides admirable circumstances for the study of changing bodily function incident to the anesthetized state.

TECHNICIANS

Surgeons have depended and still depend, to a constantly decreasing extent, on technicians for the administration of anesthetics. A reference to this situation is therefore necessary. The aid of the nursing profession has been priceless. The neglect by the medical profession of so important a function has thus been compensated to some extent. It is obvious, however, to one who has spent many years in training others in the technical as well as in the scientific aspects of pain relief that a more appropriate field for the nurse-technician in medicine is to be found in obstetrics and minor surgery, if indeed such technician assistance is necessary. True, one not possessed of a medical background can be taught to do many things in medical practice. However, the minute by minute need for knowledge and judgment in matters pharmacologic as well as physiologic is rarely so great in normal obstetrics and during certain surgical procedures as it is during the administration of a majority of anesthetics. Decisions during delivery of a parturient woman or during the removal of an appendix are seldom so likely to affect directly

the later incidence of morbidity or even mortality as are the decisions which must be made and acted on during the management of the anesthetized patient. If a technician must be used—and the present need in some localities is admitted—a physician well versed in anesthesiology should be constantly close at hand. The practice, current in some medical schools, of training nurses as anesthetic technicians and sending them out to administer anesthetics without supervision is perpetuating an unjustifiable hazard.

Our experience has taught us two important facts. 1. The employment of anesthesia technicians in a hospital seriously embarrasses the satisfactory training of medical students and doctors. 2. The average intern, after good training in the basic sciences and a half year of reliable undergraduate instruction in the clinical use of anesthesia, can, at the end of a month of carefully supervised practical experience in the operating room, be trusted with the welfare of an anesthetized patient more safely than can the average technician after years of experience. This statement is made advisedly and after long observation of persons working in both categories.

ESTABLISHMENT OF A DEPARTMENT

In what does a department of anesthesiology in a medical school consist? First and without doubt there must be a director, a physician who is the best possible clinical anesthetist as well as teacher. Progress will be more satisfactory if the director's time is devoted solely to one institution. His income should be adequate to maintain him on a par with the heads of other departments. Immediate need for assistants will depend on local circumstances and the size of the hospital. Once such a director is a part of the faculty and hospital staff, gradual development of a department in the hospital and in the school should take place. The basis of both teaching and research is good clinical anesthesia. The director's time during the first year therefore should be concerned mainly with learning the ways of the surgical staff and the staffs of other departments and fitting himself to supply their individual needs. During the director's second year, a short course of lectures and demonstrations to undergraduates can advantageously begin. If the curriculum is hopelessly crowded, possibly an hour can be offered here and there from some branch of surgery or from obstetrics. Gradually the need will become more apparent and the time will become available. As soon as possible, one or two fourth year students at a time should be assigned in rotation to clinical anesthesia. A student will learn more during one week full time than during three weeks part time. The same is true of interns. The longer the period of contact, the better will be the result. During the director's second year, residencies in anesthesia may be thought of, the number depending on the size of the hospital. Only after the clinical work is running smoothly, with the full confidence of the surgical staff, can undergraduate teaching, then graduate teaching and finally research be undertaken.

A SAMPLE DEPARTMENT

The department at the University of Wisconsin as constituted at present will be described, not because it approaches the ideal but because we are familiar with it. Organizations in existence for a shorter time are already more nearly ideal. Some of these have been

initiated in hospitals connected with medical schools, while others are in hospitals without teaching affiliations.²

This department may be outlined as follows:

A. Personnel

1. Professor of anesthesia in medical school and director of anesthesia, university hospitals; full time; salary from medical school and fee privileges for private patients
2. Instructor in anesthesia: former resident; salary from medical school
3. Research fellow: former resident; salary jointly from research fund and hospital. It is hoped to make two or three permanent associates in the future
4. From five to seven residents: duration of appointment three years; prerequisites M.D., rotating internship and preferably one year residency in internal medicine or two in general practice; stipend and maintenance similar to those of other departments
5. Interns; spend one month in the anesthesia service
6. Fourth year medical students; one week full time; fifty students in each class

B. Teaching

1. Undergraduate

- (a) One lecture, second year (courtesy of the pharmacology department)
 - (b) Course in surgical technic and anesthesia (given to one half of the third year class each semester)
Instructor and two residents supervise anesthesia and teach fundamentals of open drop ether and chloroform anesthesia with dogs
Twenty three-hour laboratory periods a year
 - (c) Sixteen lectures second semester of third year, one hour periods
Demonstration-lecture usually with anesthetized patient; quiz
- (1) History, terminology and scope of anesthesiology
Review of Fundamentals of Physiology
 - (2) Circulation
 - (3) Prophylaxis and treatment of circulatory disturbances
 - (4) Respiration
 - (5) Prophylaxis and treatment of respiratory disturbances
 - (6) The autonomic nervous system
Review of Fundamentals of Pharmacology
 - (7) Nonvolatile agents and correctives
 - (8) Gases and vapors (including fire hazard)
Fundamentals of Technic
 - (9) Oral, rectal, subcutaneous and intravenous technics
 - (10) Open drop technic; signs of anesthesia
 - (11) Carbon dioxide absorption technic
 - (12) Other inhalation technics (partial rebreathing, etc.)
 - (13) Physiology, pharmacology and technic of obstetric pain relief

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1. References include:
Gatch, W. D.: *Anesthesia in Curriculum and Clinic*, J. A. M. A. 60: 367 (Aug. 4) 1917.
Herb, Isabella: *Anesthesia in Relation to Medical Schools and Hospitals*, Am. J. Surg. 35: 30 (April) 1921.
Bourne, W.: *On the Teaching of Anesthesia to Medical Students*, Br. J. of Anaesth. 1: 74 (No. 2) 1923.
Waters, R. M.: *The Requirements of an Anesthesia Service*, *Anesth. & Analg.* 9: 219 (Sept.-Oct.) 1932.
Wright, A. M.: *Teaching and Anesthesia Service from the Viewpoint of Surgery*, *ibid.* 14: 246 (Nov.-Dec.) 1935.
Rovenstine, E. A.: *Anesthesia at Bellevue Hospital*, *Hospitals* 10: 84 (June) 1936.
Doffar, D. M.: *The Teaching of Anesthesia*, *Anesth. & Analg.* 13: 235 (Sept.) 1936.
2. References include:
Salzer, M.: *Anesthesia as a Part Time Specialty*, *Tr. Sect. Surg., Gen. & Abd.*, A. M. A., 1922, pp. 45-52.
Palmer, C. B.: *Organization of a Hospital Anesthesia Department*, *Anesth. & Analg.* 11: 50 (April) 1923.
Miller, A. H.: *Organization of the Anesthesia Service of the General Hospital*, J. A. M. A. 101: 1119 (Oct. 7) 1933.
Leech, B. C.: *Organization and Management of a Department of Anesthesia in a 200 to 400 Bed Hospital*, *Anesth. & Analg.* 13: 192 (Sept.-Oct.) 1934.
Ruth, H. S.: *Anesthesia Service*, *ibid.* 14: 243 (Nov.-Dec.) 1935.
Schwartz, A. L.: *Professional Anesthesia: A Hospital Plan in Operation Eighteen Years*, J. Indiana M. A. 29: 165 (April) 1936.
Tovell, R. M.: *The Department of Anesthesia*, *Hartford Hospitals: A Report for 1937*, *Anesth. & Analg.* 17: 268 (Sept.-Oct.) 1937.

Fundamentals of Local and Block Anesthesia

- (14) Pharmacology, principles, toxicity (prophylaxis and treatment)
 - (15) Block techniques: emphasizing simple field blocks and spinal blocks
 - (16) Therapeutic and diagnostic procedures with anesthetic drugs
 - (d) Each fourth year student for one week full time with department; preoperative check of patients scheduled for operation; operating room work; postoperative check of patients; record keeping
2. Postgraduate
- (a) Intern, twelve of house staff, one month each full time
 - (b) From five to seven residents, three year periods
 - First and third years, clinical anesthesia with some teaching experience and research
 - Second year, research major interest (anesthesia problems) with courtesy contact in laboratories of pharmacology or physiology, or clinical research
 - Trial being made of a limited number of six month appointments of graduates already practicing anesthesiology who wish a postgraduate course; not yet established; if adopted, tuition will have to be charged
 - (c) The department is open to visiting physicians at all times, though no clinical experience is offered such visitors
- C. Departmental meetings
- (a) Current literature review and discussion, two hour session, Monday 7 p. m.
One member reports each week on journals assigned to him; 106 journals covered, with occasional articles from others
A small departmental library maintained; medical school library near at hand
 - (b) Clinical work: Review of past week's cases, including deaths of surgical patients; two hour session, Wednesday, 1 p. m.
Meetings attended by whole anesthesia staff, including intern, student and visitors; chairmanship, in rotation, by residents
 - (c) First year residents required to attend all undergraduate lectures
 - (d) All members of the department expected to attend hospital staff meetings, including clinical-pathologic conferences and university medical meetings

Preoperative rounds are made each evening, when the clinical records of patients are reviewed and transferred to departmental record sheets; after the patients are seen, orders are written for premedication. Odd hours are utilized by residents and interns to examine records and patients after operation and to complete the anesthetic record. The record sheet is then coded to a Hollerith punch card for permanent filing. All records are sorted yearly and a statistical survey of the work of the department compiled. An effort is made to have each resident write at least one paper and gain experience in lecturing to medical students.

The review of basic science for the resident, aside from his attendance at undergraduate lectures, is accomplished in an entirely informal way. Frequent contact with a skeleton, models and charts in the department aids him in coordinating his knowledge of anatomy with the technique of injection anesthesia. Experimental blocks and dissection of the cadaver are made possible through the courtesy of the anatomy department. Joint research efforts are constantly in progress with the departments of physiology and pharmacology and other basic science groups as well as with the various departments of clinical practice. Constant reference to the literature is stimulated as a result of discussions in the operating room and at departmental meetings. This has seemed sufficient for all practical purposes.

A department of anesthesia must conform to the needs of the institution served. In the plan outlined, two permanent associates with an eventual rank of associate professor are essential for future development. The instructor should be retained on a semi-permanent basis. Such a personnel is an essential if the short term (six months) instruction to graduates is instituted.

SUMMARY

By anesthesiology is meant not only the science of the administration of drugs for the comfort of patients during operation but also the management of patients in depression from other causes. Pneumotherapy, intravenous therapy, therapeutic and diagnostic procedures involving the use of anesthetic drugs, and other efforts based on similar scientific knowledge, logically fall within the scope of anesthesiology. Clinical instruction in this subject is sound educational policy in the broad training of every physician. The outline given of the establishment and conduct of such a department in a teaching hospital and medical school is not ideal but may afford a groundwork on which better organizations may be constructed in other medical schools and in the various hospitals. The patient under the influence of pain-relieving drugs, together with the department of anesthesia, constitutes a natural decussation of many of the pathways between basic science and clinical teaching. Appreciation of this relation is, we believe, a contribution to our educational program.

NOTE.—The references cover only the published accounts of established departments of anesthesia. There are many departments, especially of recent origin, which have not been described in the literature.

THE INTRAVENOUS USE OF SODIUM
SULFAPYRIDINE

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AND

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BALTIMORE

The very slight solubility of sulfapyridine (2-[*p*-aminobenzene sulfonamide] pyridine) in water renders parenteral administration of this drug difficult when a route other than oral administration is desired. The poorer and more erratic absorption from the gastrointestinal tract of sulfapyridine as compared to sulfanilamide¹ necessitates its parenteral use in certain cases if high blood concentrations are to be attained. Sulfanilamide is sufficiently soluble to allow the use of subcutaneous administration of a saturated solution in physiologic solution of sodium chloride but in the case of sulfapyridine several liters of fluid would have to be given. Whitby² has suggested the injection of an oil suspension of sulfapyridine intramuscularly. There are objections to this procedure and even possible dangers.³ The very soluble sodium salt of sulfapyridine recently described and studied by Marshall, Bratton and Litchfield¹ would appear to offer a means of parenteral administration of the drug.

This investigation has been aided by a grant from the John and Mary R. Markle Foundation and a grant from the Chemical Foundation, Inc., of New York.

From the Department of Pharmacology and Experimental Therapeutics and the Department of Medicine, Johns Hopkins University School of Medicine.

1. Marshall, E. K., Jr.; Bratton, A. C., and Litchfield, J. T.: *Science* **88**: 597 (Dec. 23) 1938. Long, P. H., and Feinstein, W. H.: *Proc. Soc. Exper. Biol. & Med.* **39**: 486, 1938.

2. Whitby, Lionel: *Lancet* **2**: 1095 (Nov. 12) 1938.

3. Long, P. H.: *Lancet* **1**: 60 (Jan. 7) 1939.

Since a solution of sodium sulfapyridine is strongly alkaline (p_H 10.4 to 11.0), the only possible route of parenteral administration is the intravenous one. The p_H of such a solution is somewhat higher than that of a sodium salt of a barbiturate⁴ and lower than that of alkalized arsphenamine,⁵ but the total amount of alkali given at a dose would be greatest in the case of sodium sulfapyridine. With the experience of intravenous

TABLE 1.—Toxicity of Sodium Sulfapyridine for Dogs

Dog	Dose, Gm./Kg.	Per Cent Solution Injected	Blood Level Mg. per 100 Cc. 1 Hour After	Symptoms
A	0.1	10	10.0	None
B	0.1	5	11.1	Vomited once
B	0.1	10	11.3	Vomited once
B	0.1	20	10.9	None
C	0.1	20	17.1	None
D	0.1	20	9.7	None
E	0.1	5	10.5	None
F	0.2	10	24.2	Slight ataxia
C	0.2	10	20.8	Slight muscular twitching
G	0.2	10	22.3	Slight muscular twitching and ataxia
H	0.2	10	20.4	None
I	0.3	20	37.8	Vomiting, muscular tremor and convulsions
J	0.3	20	36.5	Vomiting, convulsions, muscular tremors
K	0.5	20	55.5	Vomiting, convulsions, died in 6-10 hours
L	0.5	20	60.6	Vomiting and convulsions
M	0.5	20	52.8	Vomiting and convulsions
N	0.5	20	58.8	Vomiting and convulsions
O	0.5	20	64.5	Vomiting and convulsions, died in 2 hours

injection of barbiturates and arsphenamine as a background, it seemed proper to use sodium sulfapyridine intravenously as an emergency measure if animal experimentation on its acute toxicity by this route seemed to justify its clinical trial. Since any delayed toxic effects and chronic toxicity from the intravenous use of sodium sulfapyridine must obviously be identical with these effects produced by the same blood concentrations of sulfapyridine administered orally, we have investigated in animals only the acute toxicity of sodium sulfapyridine by intravenous injection. The following data are taken from an unpublished study of Marshall and Litchfield on certain aspects of the pharmacology of sulfapyridine.

In table 1 is given a summary of the experiments on dogs. The symptoms from an intravenous injection of a solution of the sodium salt are identical with those observed in mice and dogs by Marshall, Bratton and Litchfield¹ after oral administration of this drug. With the exception of slight vomiting in one animal, symptoms were not observed with 0.1 Gm. per kilogram; with 0.5 Gm. per kilogram severe symptoms and convulsions were always seen, and death occurred in two out of the five dogs injected with this dose. Neither the strength of the solution used nor the rate of injection seemed to influence the symptoms, except those seen during the first few minutes, when collapse occurred if the solution was given too rapidly. Blood concentrations⁶ were done at intervals on all the animals, but those taken at about one hour (from forty-five to sixty minutes) after injection are given because at this time equilibrium between blood and tissues is certainly complete and maximum symptoms are seen.

One can note the approximate proportionality between dose and blood concentration. In table 2 are summarized data on the intravenous injection of the sodium salt into rabbits. It is clear that rabbits, even on the basis of blood concentrations, are more resistant than dogs; this may be due to the fact that the rabbit acetylates sulfapyridine very rapidly and shows a more rapid fall in blood concentration with time than does the dog, which does not acetylate at all.

On account of the well known effects on circulation and respiration caused by the injection of insoluble organic acids which require a large amount of alkali for solution,⁴ the effect of the injection of solutions of sodium sulfapyridine on the blood pressure and the respiration of anesthetized dogs was studied. Under light ether anesthesia, five dogs were given eleven injections of 0.1 Gm. per kilogram of sodium sulfapyridine in either 5 or 20 per cent solution, the time of injection varying from one half to ten minutes. The effect appears to depend on the strength of the solution and the rate of injection. With strong solutions injected rapidly, a marked fall of blood pressure and decrease of respiration occur; with weak solutions injected slowly, practically no change in blood pressure or respiration is observed. Various intermediate reactions between these extremes were observed. In the accompanying tracing the two extremes are shown.

Since it has been shown⁷ that when sulfanilamide is injected intravenously or when a sufficiently high concentration in the blood is attained by oral administration renal function is temporarily depressed, the effect of the intravenous injection of sodium sulfapyridine on the creatinine clearance of dogs has been investigated. Three or four control periods were taken to determine the creatinine clearance, an intravenous injection of 0.1 Gm. per kilogram of sodium sulfapyridine was given and the creatinine clearance was measured for several periods during the next two or three hours. No change was observed in the creatinine clearance under these

TABLE 2.—Toxicity of Sodium Sulfapyridine for Rabbits

Rabbit	Dose, Gm. per Kg.	Per Cent Solution Injected	Blood Level Mg. per 100 Cc. 1 Hour After		Symptoms
			Free	Total	
B	0.3	20	20.5	32.0	None
A1	0.5	10	44.0	54.8	Muscular twitching, mild convulsions
A2	0.5	10	45.1	56.0	Muscular twitching, mild convulsions
A3	0.5	10	45.7	49.1	Muscular twitching
A4	0.5	10	41.1	53.7	Muscular twitching
E	0.5	5	40.0	44.5	Temporary respiratory stoppage, muscular twitching
F	0.5	5	52.3	52.3	Muscular twitching, slight rigidity
G	0.5	5	50.6	50.6	None
D	0.5	20	50.6	50.6	None

conditions, indicating that in dogs an immediate effect is not produced on renal function by the intravenous injection of this dose of sodium sulfapyridine.

In view of the foregoing considerations and experimental studies on animals, a careful clinical trial of the intravenous use of sodium sulfapyridine was undertaken. It seemed that a dilute solution of the sodium salt should be used and injected fairly slowly. A 5 per cent solution in sterile distilled water was chosen. On the basis of no ionization of the salt this would be slightly hypotonic, while on the basis of complete ioniza-

4. Intravenous Use of Barbitol Compounds, Report of the Council on Pharmacy and Chemistry, J. A. M. A. 97: 1886 (Dec. 19) 1931.

5. Elvove, Ephraim, and Clark, W. M.: Bull. 135, Hyg. Lab., U. S. P. H. S., March 1924.

6. Determinations of sulfapyridine in blood were done by diazotization and coupling with *N*-(1-naphthyl)ethylenediamine. A 1:50 or 1:100 dilution was used and readings were made with a photoelectric colorimeter (Bratton, A. C., and Marshall, E. K., Jr.: J. Biol. Chem., to be published).

7. Marshall, E. K., Jr.; Cutting, W. C., and Emerson, Kendall, Jr.: The Toxicity of Sulfanilamide, J. A. M. A. 110: 252 (Jan. 22) 1938.

tion it would be slightly hypertonic. In point of fact it is probably isotonic or very nearly so. The p_H of this solution is from 10.7 to 10.8. Since the sodium salt used⁸ contained a molecule of water of crystallization, 3.8 Gm. of the salt for a patient weighing 65 Kg. would be equivalent to 0.05 Gm. per kilogram of sulfapyridine; 3.8 Gm. was the standard dose adopted for adult patients.

Injections of sodium sulfapyridine have been given to thirty patients. No symptoms of untoward effects have been noted in any case except vomiting during or immediately after the injection. No respiratory or acute circulatory disturbances were apparent during or immediately after the injection. No abnormality was observed in the routine examination of specimens of urine taken after the injection. It is interesting to note that vomiting is produced in both dogs and human subjects when sulfapyridine is given intravenously, so that the hypothesis of gastric irritation as its cause must be questioned. Determination of blood concentration values at various times after injection were made in fifteen injections in ten patients. The summary of the histories of these ten cases are given:

REPORT OF CASES

CASE 1.—W. D., a Negro aged 46, entered Johns Hopkins Hospital Feb. 9, 1939, suffering from type III pneumococcus lobar pneumonia which involved the greater part of both lung fields. The blood culture was negative. Treatment was instituted by administering sulfapyridine orally. On the day after entry the temperature was still elevated. Sodium sulfapyridine was given by the intravenous route at 8 p. m. February 10 and again February 11. The oral administration of sulfapyridine was continued as before. The patient made an uneventful recovery and was discharged February 28.

CASE 2.—J. S., a white man aged 20, entered Johns Hopkins Hospital Feb. 16, 1939, suffering from type II lobar pneumonia which involved the left lower lobe. The blood culture was negative. Sulfapyridine was administered by mouth, but because of a recrudescence of fever February 18 and the fact that the "free" blood sulfapyridine was only 2.7 mg. per hundred cubic centimeters, sodium sulfapyridine was administered by the intravenous route at 2 p. m. and 8 p. m. that day. The patient made an essentially uneventful recovery, which was marred only by a sterile pleural effusion which developed February 25 and required paracentesis on two occasions before it disappeared. He was discharged March 10.

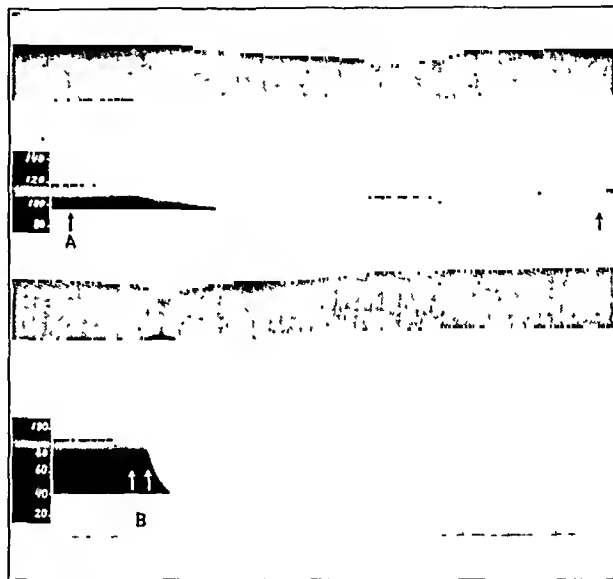
CASE 3.—C. W., a Negro aged 35, entered Johns Hopkins Hospital Feb. 20, 1939, suffering from type IV pneumococcus lobar pneumonia involving the right upper and left lower lobes. The blood culture was negative. Treatment was started with sulfapyridine by mouth. On the morning after entry to the hospital his temperature was still elevated and the level of sulfapyridine in the blood was 2.9 mg. per hundred cubic centimeters. He was therefore given the sodium salt of sulfapyridine by the intravenous route. Sulfapyridine was continued by mouth. On the eighth day the drug was discontinued because a moderate leukopenia and neutropenia developed. Recovery, however, was uneventful and he was discharged March 9.

CASE 4.—M. F., a white woman aged 47, entered Johns Hopkins Hospital Feb. 26, 1939, suffering from type III pneumococcus lobar pneumonia involving the right middle lobe. The blood culture was negative. The patient appeared quite ill. Treatment was begun with sulfapyridine administered by mouth. On the following day the temperature was elevated and the level of the sulfapyridine in the blood was 2.9 mg. per hundred cubic centimeters. She was given one intravenous injection of sodium sulfapyridine. Oral medication with sulfapyridine was continued and the patient made an uneventful recovery. She was discharged from the hospital March 12.

8. We are indebted to Dr. Randolph T. Major of Merck & Co. for a supply of the sodium salt and to Dr. K. K. Chen of Eli Lilly & Co. for the sodium salt in sterile ampules for intravenous injection.

CASE 5.—I. F., a white woman aged 38, entered Johns Hopkins Hospital Feb. 25, 1939, suffering from type III lobar pneumonia involving the right upper, middle and lower lobes. She appeared to be quite ill and showed marked distention. The blood culture was negative. Treatment was instituted by the administration of sulfapyridine by mouth. February 26 no great improvement was noted and the patient was given 3.8 Gm. of sodium sulfapyridine by the intravenous route. Medication by mouth was continued and the patient made an uneventful recovery, being discharged from the hospital March 18.

CASE 6.—G. S., a Negro aged 32, entered Johns Hopkins Hospital Feb. 4, 1939, suffering from primary type VIII pneumococcus peritonitis with bacteremia. The blood culture showed one colony of type VIII pneumococcus per cubic centimeter of blood. An exploratory laparotomy and appendectomy with drainage was done. The appendix was subsequently found to be normal. Treatment was instituted February 5 with sulfapyridine in a 0.1 per cent solution by the intravenous route. On the following day 3.8 Gm. of sodium sulfapyridine was



Effect of intravenous injection of sodium sulfapyridine on blood pressure and respiration of dogs anesthetized with ether. In A, upper curve shows respiration, lower curve mean blood pressure. In B, upper curve shows respiration, middle curve mean blood pressure, lower curve time in minute intervals. Time tracing applies for both A and B. In A, between the two arrows, slow intravenous injection of 0.1 Gm. per kilogram of sulfapyridine in the form of a 5 per cent solution of its sodium salt. In B, between arrows, rapid intravenous injection of 0.1 Gm. per kilogram of sulfapyridine in the form of a 20 per cent solution of its sodium salt.

given by the intravenous route and this dose was repeated February 7. Treatment with sulfapyridine by mouth was begun February 8. The patient's recovery was uneventful and he was discharged from the hospital February 23.

CASE 7.—M. S., a Negress aged 50, entered Johns Hopkins Hospital Feb. 6, 1939, suffering from type III pneumococcus lobar pneumonia involving the left upper and lower lobes. Treatment with type III antipneumococcus rabbit serum was started. A blood culture taken February 6 was negative but one taken February 8 showed twenty-one colonies of pneumococcus type XVI per cubic centimeter of blood. February 8 3.8 Gm. of the sodium salt of sulfapyridine was administered twice by the intravenous route and was repeated by the next day. Oral medication with sulfapyridine was commenced February 9 and continued until February 18. Recovery and convalescence were uneventful. The patient was discharged from the hospital March 7.

CASE 8.—H. H., a Negro aged 30, entered Johns Hopkins Hospital Feb. 25, 1939, suffering from type I lobar pneumonia involving the right lower lobe. He appeared to be very ill. The blood culture showed type I pneumococci. Treatment was instituted by the intravenous administration of sodium sulfa-

pyridine and was continued on the next day by giving sulfapyridine by mouth. The drug was discontinued on the fifth day of treatment because an acute hemolytic anemia developed. Recovery, however, was uneventful, and the patient was discharged March 13.

Cases 9 and 10 were essentially negative.

COMMENT

In table 3 certain additional data concerning these patients are given. The dose per kilogram is expressed in terms of sulfapyridine, the values for blood concentrations before and at various times after the injection in terms of sulfapyridine, the first figure representing the free and the second the total. In the first five cases it is to be noted that the blood concentration values represent the effect of oral as well as intravenous administration. The blood pressure was taken just before the injection and again as soon as the injection was completed. The figures for blood concentrations at various times after the injection emphasize certain important facts. It is obvious that distribution between blood and tissues is complete or nearly complete from five to ten minutes after the completion of the injection, as very little decrease occurs in these values for the next hour. The blood concentration is remarkably well sustained after a single intravenous injection, and in

limited to conditions in which oral administration is impossible or does not suffice for successful therapy.

Since our use of the intravenous injection of sodium sulfapyridine has been confined to pneumococcal infections, a statement of our present practice in treating pneumococcal lobar pneumonia with sulfapyridine may be given here.

In mildly or moderately ill adult patients it is our practice to administer an immediate dose of 4 Gm. of sulfapyridine by mouth. Then maintenance doses of 1 Gm. of the drug are given orally at intervals of four hours until the patient's temperature has been normal for at least forty-eight hours. The dose of the drug is then reduced to 1 Gm. every six hours and this regimen is continued until resolution of the pneumonic process is well under way, at which point 0.5 Gm. of sulfapyridine four times a day is begun and maintained until the lungs are clear.

If, however, the patient seems to be severely ill, the sodium salt of sulfapyridine is given by the intravenous route. The dose is calculated on the basis of 0.05 Gm. of sulfapyridine per kilogram of body weight (equivalent to 0.06 Gm. per kilogram of the sodium salt with 1 mole water of crystallization). The drug is made up in a 5 per cent solution in sterile distilled water and is given by the intravenous route. It should be injected

TABLE 3—Data on Intravenous Injection of Sulfapyridine in Patients

Case	Weight, Kg.	Dose, Gm. per Kg.	Blood Concentration in Mg. per 100 Hundred Cubic Centimeters*							Blood Pressure	
			Before	5 Min.	10 Min.	1 Hr.	4 Hrs.	12 Hrs.	24 Hrs.	Before	After
1	72	0.062	48, 71 61, 93			118, 145 118, 151	103, 141 89, 127	61, 93	. . .	118/80	117/80
2	65	0.050	27, 45 57, 80	92, 109 135, 157			61, 75 98, 128			110/80 120/80	100/80 100/80
3	62	0.052	69, 69	156, 172		140, 139	135, 136				
4	57	0.057	29, 36		97, 110	89, 106					
5	62	0.052	53, 54		139, 146	117, 125				160/20	160/20
6	54	0.060	36, 43 04, 13			75, 92 57, 75	55, 79 39, 57	13, 33	05, 17		
7	60	0.054	00, 00 54, 93			75, 60 126, 173					120/60
8	45	0.072	00, 00 08, 73	118, 118 181, 182		81, 81 148, 150	68, 73 139, 143				
9	65	0.050	00, 00		66, 69	59, 66	44, 56		07, 12		
10	60	0.054	00, 00			52, 53	39, 46	27, 34	13, 15		

* The first figure in each column represents free, the second figure total.

this respect the human subject resembles the dog more than the rabbit. One notes that the blood concentration of total sulfapyridine at one hour after injection has been from 5 to 8 mg. per hundred cubic centimeters higher than before injection; the increase in the concentration of the free form is about the same, indicating that little or no acetylation takes place in the first hour. By the fourth hour conjugation of the injected drug has begun, but in cases 3 and 8 practically no acetylsulfapyridine is present.

The intravenous use of sodium sulfapyridine is advantageous in that blood levels of from 5 to 8 mg. per hundred cubic centimeters can be attained with great speed and certainty. Not only in cases in which administration of sulfapyridine by mouth is impossible or in which intestinal absorption is very poor, but also in cases in which prompt action of the drug is imperative, the intravenous route is advisable. On the other hand, the potential dangers associated with intravenous medication in general and especially with strongly alkaline solutions of weak acids such as arsphenamine and the barbiturates must not be forgotten.⁴ Hence the intravenous use of sodium sulfapyridine should be

slowly at the rate of 5 cc. of the solution per minute. Great care should be taken that none of the solution of sodium sulfapyridine gets outside of the vein; otherwise a bad slough may result, as the solution is very alkaline. This dose may be repeated at intervals of from six to eight hours. Sulfapyridine in doses of 1 Gm. every four hours by mouth should be started at the time of intravenous therapy. Rarely have we found it necessary to give more than two injections of sodium sulfapyridine.

We also employ the solution of the sodium salt of sulfapyridine in the treatment of patients with pneumonia who are not responding to therapy by mouth because of poor absorption from the gastrointestinal tract. If on the day following the beginning of sulfapyridine treatment by mouth the patient's temperature is not below 101 F. rectal and the concentration of free sulfapyridine in the blood is below 4 mg. per hundred cubic centimeters, a single dose of 0.06 Gm. of the sodium salt per kilogram of body weight in a 5 per cent solution is administered by the intravenous route. The oral administration of sulfapyridine is continued according to schedule. In our experience this has resulted in prompt return of the temperature to normal.

The intravenous use of the sodium salt is also of value in the treatment of patients who are vomiting. Nausea and vomiting may still occur, as has been stated previously, but, because the drug is being given intravenously, effective blood levels may be maintained. We are not certain as to what concentrations of the drug in the blood are most effective. Our experience leads us to believe that a level of 4 mg. per hundred cubic centimeters or more is desirable in pneumonia of adults.

ACUTE MYOCARDIAL INFARCTION NOT DUE TO CORONARY ARTERY OCCLUSION

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It is well known that the clinical and electrocardiographic features of coronary thrombosis may be observed in patients in whom a coronary artery thrombus is subsequently not found at necropsy. In such patients the clinical picture may have been caused by a myocardial infarct in the absence of a coronary artery occlusion. The occurrence of recent myocardial infarction without acute coronary thrombosis has been noted by Libman,¹ Oberndorfer,² Büchner,³ Hamburger and Saphir,⁴ Dietrich,⁵ Levy and Bruenn⁶ and others.⁷ We have therefore undertaken a detailed systematic study of the myocardium and of the coronary vessels in order to determine the relative frequency of myocardial infarction without coronary occlusion and to discover, if possible, what physiologic factors and what clinical conditions are responsible.

It is theoretically conceivable that myocardial infarction may occur whenever there is severe myocardial ischemia, even in the absence of a mechanical occlusion of the coronary arteries. Severe myocardial ischemia and consequent acute myocardial necrosis may result from a relative inadequacy of the coronary blood flow for the functional demands of the myocardium or from changes in the blood itself. Thus Christ⁸ produced disseminated areas of ischemic necrosis in the hearts of animals poisoned by carbon monoxide, while Herzog and others⁹ observed areas of degeneration and hemorrhagic myonecrosis in human beings who had been poisoned in this manner. Similar areas of myocardial necrosis have been observed in persons suffering from severe anemia¹⁰ and in animals in which anemia had

been produced experimentally.¹¹ In cases of angina pectoris, either during an attack of spontaneous cardiac pain¹² or during exercise tests,¹³ electrocardiographic changes similar to those of coronary thrombosis have been noted. These changes may be attributed to a transient functional insufficiency of the coronary flow with consequent ischemia and even necrosis of the myocardium. Büchner¹⁴ discovered disseminated areas of myocardial necrosis in persons who had had attacks of angina pectoris during the last days of their lives but who had not suffered a coronary thrombosis. Although these isolated observations indicate that myocardial infarction may result from an inadequate coronary blood flow (coronary insufficiency) without coronary occlusion, a systematic investigation of its occurrence in human beings has not yet been reported.

It is now evident that the characteristic electrocardiogram of coronary thrombosis is due not to the thrombosis but to the resulting myocardial infarction, so that the same picture might be expected whether the myocardial injury was caused by a coronary occlusion or by coronary insufficiency. In cases in which there is pulmonary embolism, one often encounters not only a clinical picture¹⁵ but also an electrocardiogram¹⁶ which is identical with that of coronary thrombosis. In a recent study we¹⁷ presented evidence that under certain circumstances pulmonary embolism may induce severe insufficiency of the coronary circulation with consequent myocardial infarction. Although there was no coronary artery thrombus, the myocardial infarct was associated with clinical and cardiographic phenomena ordinarily observed in cases of coronary thrombosis. One of us, with Solval,¹⁸ also observed myocardial infarction without coronary thrombosis in cases of calcific aortic stenosis (Mönckeberg) and suggested that many of the resemblances of calcific aortic stenosis to coronary sclerosis and thrombosis were actually due to such myocardial lesions. A detailed investigation of this question will be reported later.

The following report of cases of myocardial infarction not due to coronary thrombosis is made both to emphasize the frequency of this condition and to note its relationship to some of the problems already mentioned.

MATERIAL

Thirty-four cases of acute myocardial infarction without coronary thrombosis were observed among the 2,000 autopsies performed at the Mount Sinai Hospital in the last four years. Three of the previously reported cases¹⁸ of calcific aortic stenosis were again studied because they also presented myocardial infarctions without thrombosis. Of the thirty-four more recent cases twenty-eight were observed in the last thousand autopsies, while only six were encountered in the preceding thousand autopsies. This increase is undoubtedly due to a more systematic study of the hearts in the last

11. Büchner, Franz, and von Lucadou, Walter: Elektrokardiographische Veränderungen und disseminierte Nekrosen des Herzmuskels bei experimenteller Koronarinsuffizienz, *Beitr. z. path. Anat. u. z. allg. Path.* 93: 169 (May) 1934.

12. Feil, Harold, and Siegel, M. L.: Electrocardiographic Changes During Attacks of Angina Pectoris, *Am. J. M. Sc.* 175: 255 (Feb.) 1928.

13. Wood, F. C., and Welferth, C. C.: Angina Pectoris, *Arch. Int. Med.* 47: 339 (March) 1931.

14. Büchner, Franz: Die Rolle des Herzmuskels bei der Angina pectoris, *Beitr. z. path. Anat. u. z. allg. Path.* 89: 644 (July) 1932.

15. Averbuck, S. H.: Differentiation of Acute Coronary Artery Thrombosis from Pulmonary Embolization, *Am. J. M. Sc.* 187: 391 (March) 1934.

16. McGinn, Sylvester, and White, P. D.: Acute Cor Pulmonale Resulting from Pulmonary Embolism: Its Clinical Recognition, *J. A. M. A.* 104: 1473 (April 27) 1935.

17. Horn, Henry; Dack, Simon, and Friedberg, C. K.: The Cardiac Sequelae of Pulmonary Embolism, *Arch. Int. Med.*, to be published.

18. Friedberg, C. K., and Solval, A. R.: Nonrheumatic Calcific Aortic Stenosis, *Am. Heart J.*, to be published.

From the Medical Services and the Laboratories of the Mount Sinai Hospital.

1. Libman, Emanuel: *Am. Heart J.* 1: 121 (May) 1925; 10: 399 (Feb.) 1935.

2. Oberndorfer: Die anatomischen Grundlagen der Angina pectoris, *München, med. Wchnschr.* 72: 1495 (Sept. 4) 1925.

3. Büchner, Franz; Weber, Arthur, and Haager, Berthold: Koronarinfarct und Koronarinsuffizienz, Leipzig, Georg Thieme, 1935.

4. Hamburger, W. W., and Saphir, Otto: Pulmonary Embolism Complicating and Simulating Coronary Thrombosis, *M. Clin. North America* 16: 383 (Sept.) 1932.

5. Dietrich, A.: Kranzgefässsklerose und Herzinfarkt nach Analyse eines Einzelfalles, *Frankfurt. Ztschr. f. Path.* 45: 456, 1935.

6. Levy, R. L., and Bruenn, H. G.: Acute Fatal Coronary Insufficiency, *J. A. M. A.* 106: 1080 (March 28) 1936.

7. Bohning, Anne L., and Katz, L. N.: Four Lead Electrocardiogram in Cases of Recent Coronary Occlusion, *Arch. Int. Med.* 61: 241 (Feb.) 1938.

8. Christ, Curt: Experimentelle Kohlenoxydvergiftung Herzmuskeln nekrosen und Elektrokardiogramm, *Beitr. z. path. Anat. u. z. allg. Path.* 94: 111 (Oct.) 1934.

9. Herzog, G.: Zur Pathologie der Kohlenoxydvergiftung mit makro- und mikroskopischen Demonstration, *Deutsche med. Wchnschr.* 67: 558 (May) 1920. Kroetz, C.: *g. 28* 1936.

10. Opitz, Erich: Herzmuskelveränderungen durch Störung der Sauerstoffzufuhr, *Ztschr. f. Kreislaufforsch.* 27: 227 (April 1) 1935.

few years, during which time we directed special attention to the subject of myocardial infarction without thrombosis. It emphasizes that diligent search is necessary to discover these lesions. In the last thousand autopsies, in which there were twenty-eight cases of myocardial infarction without coronary thrombosis, there were also sixty-three cases of myocardial infarction due to acute coronary thrombosis. Thus, as much as 31 per cent of the total number of cases of myocardial infarction occurred without acute coronary thrombosis (table 1).

TABLE 1.—Cases of Myocardial Infarction in 2,000 Consecutive Necropsies*

Autopsy Numbers	Total	With Coronary Thrombosis		Without Coronary Thrombosis	
		Number of Cases	Per Cent	Number of Cases	Per Cent
9,001-10,000	62	56	90	6	10
10,001-11,000	91	63	69	28	31

*There were three additional cases utilized from necropsies preceding No. 9,001.

In thirty-two of the total thirty-seven cases, the heart on gross examination presented severe recent myocardial damage. Five other hearts presented microscopic acute myocardial lesions, which were discovered only on systematic study of a series of cases of recurrent pulmonary embolism.

Whenever acute myocardial lesions without recent coronary thrombosis were noted, the main coronary arteries and their branches were studied in detail throughout their course to make sure that a thrombus was not overlooked. In routine postmortem examinations, even when these are carefully performed, a coronary thrombus may be missed. We believe, so far as possible without complete microscopic serial sections, that our systematic study of the coronary vessels excludes the possibility that a coronary thrombus was present. Recent reports¹⁹ and personal observations have shown that many so-called coronary artery thrombi are really occlusions of the coronary arteries secondary to a hemorrhage into an arteriosclerotic plaque. Such occlusions, like primary coronary artery thrombosis, produce myocardial infarction. In none of the cases of myocardial infarction here reported were there occlusions due to hemorrhage within the wall of the coronary artery. Nor were there multiple closures of the small myocardial branches of the coronary arteries. All the hearts were personally examined by us.

Transverse sections were made throughout the entire course of each main artery and its branches, at intervals of 3 mm. Extremely narrowed portions of the vessels or areas that were suspected of being the site of a thrombus were sectioned at even closer intervals and were studied microscopically. Whenever possible, the following branches were carefully examined: the left anterior descending and its primary and secondary rami; the left circumflex and its branches to the anterior wall of the left ventricle, to the obtuse margin of the heart and to the posterior wall of the left ventricle; the main right coronary branch; the right circumflex artery and the branches to the posterior interventricular

sulcus and to the posterior wall of the left ventricle, and the branches of the right coronary to the anterior and posterior walls of the right ventricle and to the acute margin of the heart. The branches to the auricles were also examined but were frequently of minute caliber or could not be followed. The degree of arteriosclerosis and narrowing of the various coronary vessels and of the coronary ostiums was graded from one to four plus, according to their severity. The myocardium itself was diligently studied, grossly and histologically, sections being taken from the anterior and posterior portions of the right and left ventricle, of the interventricular septum, of the anterior and posterior papillary muscles and of any additional areas that appeared abnormal. The hearts were also examined for disease of the valves, pericarditis, endocardial abnormalities and mural thrombi.

CLINICAL FEATURES

The clinical features are best presented in groups of cases, according to the various diseases that precipitated or predisposed to the myocardial infarction (table 2). In general, however, the entire series of cases presented one or more of the following clinical pictures: (1) cardiac pain and other clinical and cardiographic signs resembling coronary thrombosis, (2) cardiac failure with or without sudden death, (3) shock and (4) intercurrent diseases unrelated to the heart. Thus, in a general way the clinical pictures resembled those encountered in myocardial infarction due to coronary thrombosis.

The largest group, twelve cases, was associated with recurrent pulmonary embolism. Four of the patients had suffered from hypertension and an equal number from attacks of angina pectoris. In three there were symptoms of congestive heart failure. Five of the patients died in shock. Electrocardiograms had been taken in six of the cases and in three of them the cardiographic abnormalities suggested an acute coronary occlusion.

A second large group included nine instances of calcific aortic stenosis. The patients were all men and, except for one man of 30, were between the ages of 50

TABLE 2.—Clinical Groups of Cases of Myocardial Infarction Without Coronary Thrombosis

	Number of Cases
Pulmonary embolism	12
Calcific aortic stenosis	9
Coronary narrowing, old occlusion and cardiac failure ..	6
Postoperative infarction	4
Severe acute anemia	3
Malignant hypertension with cerebral complication	3
Occlusion of superior mesenteric artery	1
Total	37

and 74. Hypertension was present in four cases and angina pectoris in five. Except for one patient, they were hospitalized because of symptoms of failure of the left side of the heart, to which usually those of failure of the right side were eventually added. In four of the cases death occurred rather suddenly and unexpectedly. Bundle branch or intraventricular block was present in four, and T and RT abnormalities were present in five of the cases. The clinical diagnosis most commonly suggested was coronary arteriosclerosis and cardiac failure. In two a diagnosis of coronary thrombosis had been made.

A third group was composed of six cases in which coronary insufficiency was apparently due to severe

19. (a) Paterson, J. C.: Capillary Rupture with Intimal Hemorrhage as a Causative Factor in Coronary Thrombosis, *Arch. Path.* 25: 474 (April) 1938. (b) Wartman, W. B.: Occlusion of the Coronary Arteries by Hemorrhage into Their Walls, *Am. Heart J.* 15: 459 (April) 1938. (c) Winternitz, M. C.; Thomas, R. M., and LeCompte, P. M.: The Biology of Arteriosclerosis, Springfield, Ill., Charles C. Thomas, 1938.

coronary disease itself, without recent occlusion and without any associated valvular or extracardiac factor capable of inducing coronary insufficiency. At least three of the patients had had moderate hypertension. In all but one there was a history of angina pectoris, usually related to effort. Evidence of failure of the right side of the heart was found in all. Usually there was an intensification of the signs of failure shortly before death, or else there was an acute attack of severe and persistent cardiac pain or of pulmonary edema and shock. The electrocardiograms were interpreted as indicative either of myocardial damage or of a previous myocardial infarction. In two cases there were progressive electrocardiographic changes characteristic of recent myocardial infarction.

Four cases were observed in which myocardial infarction appeared after an operative procedure. The ages ranged from 54 to 79. Three were patients with hypertension and diabetes. Two of them had had attacks of acute urinary retention due to prostatic obstruction; one died five days after a suprapubic cystostomy; in the other clinical and cardiographic evidences of myocardial infarction developed in the third week after a similar operation. In a third case, on the second day after operation for a strangulated femoral hernia, the blood pressure dropped from 168 mm. of mercury systolic and 90 diastolic to 110 systolic and 64 diastolic. Transient atrioventricular dissociation developed and she died suddenly on the seventeenth day after operation with symptoms of shock. The fourth patient died three days after a cecostomy for an obstructing carcinoma of the sigmoid colon.

In three cases, myocardial infarction was found in persons who clinically presented a cerebral complication of severe hypertension. In all three the systolic pressure was well above 200 mm. of mercury and the diastolic pressure above 120. During the week before death, evidence of progressive cerebral softening, characterized by a stiff neck, changes in the reflexes and an appearance resembling decerebrate rigidity developed in one patient. The second patient suddenly became unconscious, suffered a hemiplegia and died in pulmonary edema and shock. The third patient, a woman aged 28, presented signs of uremia and acidosis. Eight days before death convulsions developed which were attributed to hypertensive encephalopathy. In none of these cases was there a fall in blood pressure.

In the remaining four cases anemia or shock may have played a role in precipitating coronary insufficiency and ensuing myocardial infarction. One patient was a woman aged 19 in whom in the fifth month of pregnancy a bloody diarrhea developed as the result of ulcerative colitis. Following sulfanilamide therapy her temperature rose to 106 F., the hemoglobin dropped to 15 per cent and she died with symptoms of peritonitis and bronchopneumonia. Sulfanilamide itself has not been found to produce myocardial necrosis. The second patient was a man aged 59 who vomited a large amount of black fluid, became very weak and had several loose, bloody and tarry stools. The hemoglobin fell to 45 per cent. Despite transfusions, acrocyanosis of both hands and feet developed and he went into collapse and died eleven days after the onset of the attack. The third patient was a man aged 78 in whom signs of shock developed as the result of an occlusion of the superior mesenteric artery with infarction of the intestine. The fourth was a man aged 66 with severe acute hemolytic anemia.

PATHOLOGY OF THE HEART

Ordinarily, infarction denotes the morphologic changes, including necrosis, in an organ whose blood supply is interrupted. Technically, therefore, the objection could be raised that the lesions observed in these cases cannot be termed infarcts because there is no actual occlusion of the nutritive vessels. The myocardial changes seen in the cases cited, however, were indistinguishable from those ordinarily described as infarcts and, like infarcts, consisted of areas of necrosis due to ischemia caused by an inadequate coronary blood supply. Occasionally a large confluent area of muscle was affected, similarly to that observed with recent occlusion of a major coronary vessel. More often, however, there were smaller isolated or disseminated foci of myomalacia, recognizable grossly.

The myocardial lesions were, in the main, confined to the wall of the left ventricle and its papillary muscles. The vulnerability of this site has been previously stressed by Büchner.¹⁴ This localization was especially remarkable when, as in a few cases, the acute myocardial damage was entirely or almost entirely confined to one of the papillary muscles of the left ventricle. The anterior wall was affected somewhat more frequently than the posterior, but as a rule there were microscopic lesions in both of these segments of the left ventricle. Another feature of localization of the myocardial lesions is their occurrence in the subendocardial region. This is the portion of the myocardium farthest removed from the blood supply and therefore most severely affected by a relative insufficiency of the coronary flow. The localization of acute ischemic myocardial lesions to the subendocardial region also suggests that the nourishment of muscle fibers through the thebesian vessels is insignificant.

The gross changes varied in severity and extent. They consisted of greenish, yellowish or grayish discoloration of the muscle tissue, which was often streaked or mottled with hemorrhage. Often, however, hemorrhagic areas appeared on microscopic examination to be areas of organization with numerous congested capillaries and other small vessels. Occasionally the gross appearance of the affected myocardium was that of fatty change. Healed fibrous areas were often associated with acute necrosis. In some cases there were extensive fibrotic areas or aneurysms of the heart wall due to an old coronary occlusion.

Microscopic study revealed acute, organizing and chronic lesions. Early evidences of myocardial degeneration consisted of an uneven staining of the muscle fibers with the appearance of darker and lighter eosinophilic bands and loss of myostriation. Signs of more severe ischemic change were vacuolization of the muscle fibers, karyorrhexis or complete disappearance of their nuclei and, finally, homogenization and disappearance of muscle fibers. Sometimes there were large areas of vacuolated muscle fibers and fibrous tissue. In the vicinity of the necrotic muscle there were usually reactive foci of polymorphonuclear leukocytes, lymphocytes and mesenchymal cells²⁰ and sometimes focal or widespread areas of hemorrhage. Organization occurred early, as indicated by fibroblasts, cellular edematous connective tissue and congested blood vessels.

As a rule the coronary vessels showed extensive arteriosclerotic thickening with narrowing of their lumens. The left anterior descending branch appeared

20. Ehrlich, J. C., and Lapan, B.: The Anitschkow Myocyte, to be published.

to be most frequently and most severely involved, although the circumflex branch of the left coronary and the main right coronary and its circumflex branch were also conspicuously affected. There was no evidence either of intramural hemorrhage or of recent thrombosis of the coronary arteries or their branches. In the group of cases presenting coronary narrowing and failure, without other associative disease, there was almost invariably evidence of an old coronary occlusion. On the other hand, there were several cases in the group presenting pulmonary embolism and isolated instances in the other groups in which the coronary vessels were essentially normal or gave only slight evidences of arteriosclerosis without narrowing (table 3).

Except in a few cases the hearts were markedly hypertrophied and weighed considerably more than normal. However, a number were of normal size. The heart of a 19 year old girl with anemia weighed

TABLE 3.—Heart Weight and Degree of Coronary Narrowing

Group	Heart Weight, Gm.		Degree of Coronary Narrowing		
	Average	Range	None or Slight	Moderate	Severe
Pulmonary embolism...	420	300-560	4	2	6
Calcific aortic stenosis...	710	450-1300	2	3	3
Coronary narrowing and old coronary occlusion	380	260-460	0	0	6
Postoperative	465	420-580	1	0	3
Malignant hypertension	450	360-495	2	1	0
Severe acute anemia...	440	225-660	2	0	1
Occlusion of superior mesenteric artery....	475	.....	0	1	0
Totals			11	7	19

only 225 Gm. But as a rule the heart weights averaged between 400 and 500 Gm. The largest hearts were those associated with calcific aortic stenosis. The weights ranged between 450 and 1,300 Gm., the average being 710 Gm.

ILLUSTRATIVE CASES

CASE 1.—*Massive pulmonary embolism* (practice of Dr. Samuel Silbert).

A man aged 58 had for fifteen years suffered pain in the left calf on walking. For two weeks there was pain in both legs even at rest. Occasionally the patient had suffered from precordial pain, which was also worse on exertion. Examination revealed a large heart and a systolic murmur at the apex. The popliteal vessels were closed. The blood pressure was 130 systolic and 80 diastolic. The diagnosis was arteriosclerotic narrowing of the arteries of the lower extremities.

After two weeks in bed the patient contracted an infection of the left foot and lymphangitis of the left leg. The next day attacks characterized by loss of consciousness, feeble pulse and temporary cessation of respiration developed. Eight days later he died in one such attack. An electrocardiogram, revealing depression of the ST interval in leads 1 and 4, elevation in lead 3 and diphasic T waves in lead 4, was interpreted as suggesting acute myocardial infarction. Postmortem examination revealed massive pulmonary embolization involving the pulmonary conus and the main branches of the pulmonary artery; subacute myomalacia of the septum and left ventricle, and severe arteriosclerotic narrowing of the main branches of the left coronary artery, but no occlusion.

CASE 2.—*Calcific aortic stenosis* (service of Dr. George Baehr).

A man aged 68 had a history of mild diabetes and excessive alcoholism. For one year he had suffered from weakness, dyspnea and substernal and precordial pain on exertion. Eight days before his admission to the hospital, very severe and persistent cardiac pain developed, accompanied by intense dyspnea and prostration. An electrocardiogram, taken five months before admission, disclosed a prolonged PR interval (0.28

second) and intraventricular block. His blood pressure at that time was 170 systolic and 90 diastolic.

Examination in the hospital revealed slight cyanosis, congestion of the base of the lungs, enlargement of the heart and a harsh diffuse systolic murmur, loudest over the aortic area. The blood pressure was 90 systolic and 65 diastolic. The clinical diagnosis was coronary artery thrombosis and diabetes mellitus. The patient died twelve hours after admission.

Necropsy showed diffuse myocardial necrosis, especially in the subendocardium of the left ventricle and in the posterior papillary muscle, calcific stenosis of the aortic valve, carcinoma of the fundus of the stomach, and cirrhosis of the liver. The coronary vessels were moderately arteriosclerotic but widely patent.

CASE 3.—*Severe coronary narrowing without recent occlusion* (service of Dr. George Baehr).

A woman aged 42 had suffered from dyspnea and angina pectoris on effort and from intermittent claudication for five years. Six months before admission to the hospital she had a severe attack of cardiac pain, which recurred intermittently for seven weeks. During three months in bed the patient became intensely dyspneic and orthopneic, and edema of the ankles developed. After a partial remission the symptoms became greatly intensified three days before admission. On examination the patient was acutely dyspneic, orthopneic and somewhat cyanotic. The heart was enlarged to the left and its sounds were of poor quality. There was a gallop rhythm with a rate of 120 a minute. There were a large tender liver, dependent edema, pleural effusions and engorgement of the cervical veins. The blood pressure was 110 systolic and 55 diastolic but rapidly fell to 80 systolic and 60 diastolic. The electrocardiogram, taken a day after admission, disclosed a ventricular tachycardia with a rate of 200 a minute, right axis deviation, widening and notching of the QRS complexes and inversion of the T wave in lead 3. The patient died thirty-six hours after admission. The clinical diagnosis was coronary sclerosis, recent coronary thrombosis and congestive heart failure.

Postmortem examination revealed moderate arteriosclerotic narrowing of the left and severe narrowing of the right coronary artery and branches. There was an old atherosclerotic occlusion of the main right coronary artery, a large scar of a healed infarct with early aneurysm of the anterior wall of the left ventricle and acute myomalacia of the interventricular septum. Recent coronary occlusion could not be found.

COMMENT

The myocardial lesions in these cases were interpreted as being due to an intense myocardial ischemia caused by an inadequate coronary blood supply. Clinically and pathologically these cases did not appear to differ essentially from those presenting myocardial infarction due to an acute thrombotic occlusion of the coronary vessels. In most instances, coronary insufficiency was due in part to atherosclerotic narrowing of the coronary arteries. However, these changes did not usually appear sufficient in themselves to produce the acute myocardial necrosis, and in some cases myocardial infarction occurred when the coronary vessels were normal. It is likely that the associated disease, such as pulmonary embolism and calcific aortic stenosis, acted as a precipitating or contributing factor in the myocardial infarction. Occasionally two of these diseases were combined in one case. That these associated diseases were not merely coincidental appears to be corroborated by their frequency in cases of myocardial infarction without coronary thrombosis. Further support may be found in the pathologic physiology and clinical signs of these diseases, which indicate that there is a relative diminution in coronary flow and myocardial ischemia. Myocardial necrosis without coronary occlusion in the epileptic has been ascribed to spasm of the coronary arteries.²¹ The possible role of coronary

21. Neubürger, Karl: Ueber die Herzmuskelveränderungen bei Epileptikern, Frankfurt. Ztschr. f. Path. 46: 14, 1933.

spasm in the production of myocardial infarction in the cases here reported is a matter of conjecture.

The relation of recurrent pulmonary embolism to myocardial infarction is discussed in detail elsewhere. We believe that coronary insufficiency occurs with pulmonary embolism chiefly because of the attendant shock. The associated asphyxia and exaggerated vagal reflexes causing coronary constriction may also play a role. Myocardial necrosis is not an invariable result of pulmonary embolism. Pulmonary embolism is most likely to produce myocardial ischemia severe enough to cause morphologic myocardial change if there is recurrent embolization, if the coronary arteries are already narrowed by arteriosclerosis, if the heart is previously hypertrophied and if there is an adequate duration of life after the embolism.

Clinical evidences of myocardial ischemia in calcific aortic stenosis are quite familiar. They consist essentially of angina of effort, conduction disturbances, abnormalities of the RS-T transitions and T waves in the electrocardiogram, and sudden death. The conspicuous hypertrophy of the hearts, the average weight of which in our series was 710 Gm., indicates the increased demand for blood in these cases. Presumably there is a chronic state of myocardial ischemia due to an inadequate coronary supply even when the coronary vessels themselves are normal. But frequently in these cases there was, in addition, moderate or severe narrowing of the coronary vessels, which tended to increase the coronary insufficiency. Coronary insufficiency in cases of calcific aortic stenosis is due, on the one hand, to the greater blood supply needed to accommodate the increased musculature and work of the heart and, on the other hand, to the diminished coronary flow because of the high intraventricular tension and increased systolic peripheral coronary resistance.²² The coronary flow is further diminished when the vessels are narrowed by arteriosclerosis. This disproportion between coronary flow and myocardial requirement is accentuated during exertion because of the absence of ventricular reserve.

The pathologic physiology of coronary insufficiency in the remaining groups of cases can only be conjectured. In the cases occurring after operation, the shock of operation itself may have been an important factor; but it should be emphasized that in three of our four cases in this group the patients had hypertension and diabetes with large hearts, narrow coronaries and clinical and pathologic evidence of a previous coronary occlusion. The shock factor may be invoked also in cases of myocardial infarction associated with severe gastrointestinal hemorrhage and with embolism of the superior mesenteric artery. In cases presenting severe anemia, myocardial infarction might have resulted from the reduced oxygen-carrying power of the blood. Anemia per se was an extremely uncommon cause of myocardial infarction in our material. A systematic study of the relation of myocardial infarction to anemia will be reported.

The relationship between cerebral complications, particularly cerebral thrombosis, and myocardial infarction is also uncertain. The three patients in this group all had severe (so-called malignant) hypertension and large hearts, but their coronary vessels were surprisingly little altered. Myocardial changes in cases of malignant hypertension have been reported by Schür-

mann and MacMahon.²³ We believe that these lesions are the result of functional coronary insufficiency and not of the altered permeability of the coronary vessels, which these authors have termed "dysorie."

The remaining group of cases, in which acute myocardial infarction occurred as a result of coronary narrowing alone, is of special interest. Apparently such narrowing, if severe enough, can produce extreme myocardial ischemia and consequent acute infarction in the absence of acute occlusion. Usually a previous occlusion, arteriosclerotic or thrombotic, of a main coronary branch had already seriously compromised the coronary blood supply, while a large aneurysmal scar of the healed infarct had reduced the effective cardiac musculature. These incidents were denoted clinically not only by angina pectoris of effort but also by signs of congestive heart failure. Progressive narrowing of the remaining, already narrowed, coronary vessels finally produced sufficient ischemia to cause acute morphologic changes. The immediate precipitating factor is uncertain, but the occurrence of the acute infarction is usually denoted clinically by an intensification of the signs of failure with or without cardiac pain.

Finally, it should be reemphasized that the clinical features and electrocardiographic alterations attributed to acute coronary thrombosis are due actually to the resulting myocardial damage. Since acute myocardial necrosis may occur with severe coronary insufficiency without thrombosis, it is clear that in such a disease as calcific aortic stenosis and other conditions associated with coronary insufficiency, a clinical picture identical with that of coronary thrombosis may be observed and no coronary thrombus found. It would appear more accurate to employ the clinical diagnosis myocardial infarction than coronary thrombosis. An attempt should be made to determine clinically the presence of a contributing cardiac or extracardiac factor which may be responsible for the infarct.

SUMMARY

1. Thirty-seven cases of acute myocardial infarction not due to coronary thrombosis were observed in some 2,000 autopsies. In the last 1,000 autopsies 31 per cent of the cases of myocardial infarction were found without recent coronary thrombosis.

2. Twelve cases were associated with pulmonary embolism, eight with calcific aortic stenosis and six with intense coronary narrowing and old occlusion; four occurred after operation and three after a cerebral accident in patients with malignant hypertension. In three there was severe anemia and in one an occlusion of the superior mesenteric artery.

3. It is suggested that the acute myocardial damage in the various cases was due to intense coronary insufficiency. This insufficiency was due in part to arteriosclerotic narrowing of the coronary arteries and to myocardial hypertrophy but also to the abnormal circulatory dynamics of the associated disease, which usually precipitated the infarction. Myocardial infarction may also be due solely to progressive coronary narrowing of extreme degree.

4. Sudden death in aortic stenosis and other diseases associated with coronary insufficiency may be caused by severe myocardial ischemia and necrosis without recent occlusion of the coronary artery.

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22. Green, H. D.: The Coronary Blood Flow in Aortic Stenosis, *Am. J. Physiol.* **115**: 94 (March) 1936.

23. Schürmann, P., and MacMahon, H. E.: Die maligne Nephrosklerose, *Virchows Arch. f. path. Anat.* **291**: 47, 1933.

REMOVAL OF THE THYMUS

SURGICAL VERSUS ROENTGEN RAY EXTIRPATION

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In a series of recent articles, co-authors Shay, Gershon-Cohen, Fels and the Meranzes¹ have reported that roentgen ray destruction of the thymus gland in young albino rats produced a delayed development of the male testes, with resultant temporary sterility, and a hypophysial change similar histologically to that produced by castration. These changes were said to be progressive to the age of 100 days, after which reparative processes were said to be instituted which resulted in complete recovery of the testes. These observations deserve careful consideration in the light of the many negative results previously obtained by surgical extirpation of the thymus. We believe that the average clinician should be aware of the differences in effect of the two methods. It is with this fact in mind that we wish to present our experimental results and views on this controversial subject.

We would assume that roentgen ray ablation of the thymus gland, experimentally at least, was for the same primary purpose as surgical removal, namely to determine what effects a lack of thymus secretion would have on the experimental animal. We would further assume that similar results should be obtained under the two circumstances.

Park and McClure,² who reviewed the entire subject of thymectomy and who included a series of experimental observations on dogs, were of the opinion that extirpation of the thymus probably does not influence growth or development and the thymus is not essential to life. Hammar,³ Crotti,⁴ Marine⁵ and Andersen⁶ have likewise reviewed the literature and have arrived at essentially the same conclusions. Our own observations, which we wish to present, add only to the confirmation of their data.

Pappenheimer⁷ showed that complete removal of the thymus gland in the rat could be effected through surgical means. He made serial sections through the viscera of the neck and thorax to prove that there were no remnants postoperatively. Einhorn and Rowntree⁸ believe that surgical removal is more satisfactory than roentgen irradiation. We wish at the outset to concur with them and with others who have performed thy-

mectomy on the albino rat in the observation that thymectomy through the midline, sternum-splitting incision described by Basch⁹ is a simple and complete operation. It required no longer than five minutes to anesthetize the animal, expose and remove the gland and repair the wound. Subsequent autopsy did not show regeneration of fragments. Thus the removal of the thymus could be said to be complete and final. Furthermore, it did not entail subjecting the animals to the repeated trauma which would result from the relatively massive doses of roentgen rays on four successive days, as in the procedure of Shay and his co-authors.¹ Yet these writers suggest that total destruction of the thymus is more easily and completely effected by roentgen irradiation. They insist that irradiation resulted in complete atrophy of the thymus and at the same time state that complete removal was not necessary to obtain the results which they report.

EXPERIMENTAL OBSERVATIONS AND RESULTS

Our observations were made on twenty-four male Wistar albino rats; twelve were thymectomized at an average age of 25 days, and twelve, used as controls, were subjected to the identical operative technic except

*A Comparison of Mean Weights and Differences in Thymectomized and Control Male Wistar Albino Rats**

(From 25 to 90 day animals)

	Control	Tests	Difference
Body weight	267.00	265.30	-1.70
Head weight	21.46	21.65	+0.19
Body length	22.05	21.87	-0.18
Tail length	20.16	19.83	-0.33
Hypophysis	0.0083	0.0078	-0.0005
Thyroid	0.0180	0.0182	+0.0002
Adrenals	0.0278	0.0285	+0.0007
Spleen	0.5613	0.4917	-0.0696
Testes	2.8708	2.8178	-0.0530
Epididymides	0.7853	0.7609	-0.0244

* Measurements in grams or centimeters.

for the actual removal of the gland. The rats were killed and examined post mortem at an average age of 90 days. The hypophysis, thyroid, adrenals, testes, epididymides and spleen were removed and weighed. Supplementary recordings as to body weight, head weight, body length and tail length were also made. These measurements were subjected to small sample statistical analysis in order to observe more accurately whether or not mathematically significant changes had occurred. All methods employed were standardized ones, previously used and described.¹⁰

As a result of this experiment, we were unable to confirm any of the observations reported by Shay and his co-workers.¹ There were no significant quantitative changes in the length of the body and tail or in the weight of the head, body, hypophysis, thyroid, suprarenal glands, testes and epididymides. Weekly recordings of the body weight did not reveal significant changes. There was a significant change in the weight of the spleen, but we wish to reserve this fact for

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1. (a) Gershon-Cohen, Jacob; Shay, Harry; Fels, Samuel S.; Meranze, Theodore, and Meranze, D. R.: Studies in the Physiology of the Thymus, *Science* 57: 20 (Jan. 7) 1938; (b) The Thymus: The Effect of Atrophy of Thymus Following Roentgen Irradiation, *Am. J. Roentgenol.* 39: 263 (Feb.) 1938; (c) The Thymus: Studies of Some Changes in the Gonads and Pituitary Following Its Destruction by Roentgen Irradiation, *J. A. M. A.* 112: 290 (Jan.) 1939.

2. Park, E. A., and McClure, Roy D.: The Results of Thymus Extirpation in the Dog with a Review of the Experimental Literature on Thymus Extirpation, *Am. J. Dis. Child.* 18: 317 (Nov.) 1919.

3. Hammar, J. A.: The New Views as to the Morphology of the Thymus Gland and Their Bearing on the Problem of the Function of the Thymus, *Endocrinology* 5: 543 and 731, 1921.

4. Crotti, André: Thyroid and Thymus, revised edition, Philadelphia, Lea & Febiger, 1922.

5. Marine, David, in Cowdry, E. V.: Special Cytology, New York, Paul B. Hoeber, Inc., 1928, vol. 1, section 18, p. 558.

6. Andersen, Dorothy H.: The Relationships Between the Thymus and Reproduction, *Physiol. Rev.* 12: 1 (Jan.) 1932.

7. Pappenheimer, A. M.: The Effects of Early Extirpation of the Thymus in Albino Rats, *J. Exper. Med.* 19: 319, 1914.

8. Einhorn, Nathan H., and Rowntree, Leonard G.: The Biological Effects of Thymectomy, *Endocrinology* 21: 659 (Sept.) 1937.

9. Basch, K.: Beiträge zur Physiologie und Pathologie der Thymus: I. Ueber die Ausschaltung der Thymusdrüse, *Jahrb. f. Kinderh.* 64: 285, 1906; quoted by Park and McClure.²

10. Freudenberg, C. B., and Hashimoto, E. I.: A Summary of Data for the Effects of Ovariectomy on Body Growth and Organ Weights of the Young Albino Rat, *Am. J. Anat.* 62: 93 (Nov.) 1937. Freudenberg, C. B., and Clausen, F. W.: Quantitative Effects of Theelin on Body Growth and Endocrine Glands of Young Albino Rats, *Anat. Rec.* 69: 171 (Sept.) 1937.

future confirmation with another group of animals, which we are at present studying.^{10a}

Criticism might arise from the fact that our rats were 25 days of age at the time of operative removal of the thymus, but Andersen,⁶ whose work is not quoted by Shay,¹ with a more nearly comparable group of young male rats did not confirm their results. She reported that in animals thymectomized at the age of 1 day, for which litter mates served as controls, there were no significant alterations in the age or weight at puberty. She summarized her results by stating that "from an analysis of this work on thymectomy, we may conclude that thymectomy does not prevent, hasten or delay the arrival of sexual maturity, and it does not prevent the occurrence of normal litters. In other words, aside from the immediate effects of the operative injury, it has not been shown that deprivation of thymus, even in early life, has any effect upon the development and function of the sexual apparatus."

In reviewing the articles submitted by Shay and his co-workers¹ we were somewhat at a loss as to the exact number of litter mates used in their experiment. It was stated^{1b} that there were thirty-five litters of animals, but there was no record in any of the articles of individual protocols to which reference could be made. The growth chart appears to have been constructed from one litter of animals (litter 19). Likewise, the organ weight:body weight ratios appear to have been derived from observations made on one litter (litter 18). In similarly limited data, it is always possible to obtain great variation in either direction, depending on the litter selected. Since their three papers, which followed in rapid succession, were admittedly incomplete, we have no doubt that future papers will contain the necessary data.

COMMENT

In view of the marked discrepancies in the results obtained with the two methods, i. e. surgical extirpation and roentgen ray ablation of the thymus, some explanation would seem logical.

The male albino rat at the age of 48 hours has an average length of from 47 to 52 mm.¹¹ The aperture of from 8 to 10 mm. through which Shay and his co-workers¹ irradiated the thymus would therefore constitute approximately one fifth of the total body length of the animal. This would seem to be a relatively large area to subject to massive roentgen ray exposure, although these authors^{1b} went to some lengths to prevent stray irradiation.

Dissection of 2 day old animals reveals that in many instances the two superior poles of the thymus gland extend paratracheally as high as the thyroid gland. Further, there is hardly a difference of from 5 to 7 mm. between the upper portion of the body of the thymus and the lower portion of the thyroid. Conceivably, in order to effect complete exposure of the thymus gland, one must direct the roentgen rays dangerously close to the area of the thyroid; in fact it is questionable whether one could be absolutely certain that the thyroid gland did not receive stray irradiation. In further substantiation of these anatomic hypotheses, these authors say: "In some animals we tried to give exposures above the area of the thymus. This was

found to be impossible, because in order to avoid the region of the thyroid the upper part of the thymus was usually involved, so that varying degrees of destruction of the thymus resulted in this group." Obviously, if it was impossible to avoid the upper part of the thymus during irradiation of the area near the thyroid gland, we must assume, conversely, that it would also be impossible to avoid the thyroid gland or immediately adjacent areas in attempting to destroy the thymus completely.

In strapping the animal to the board, the head is necessarily extended, throwing the base of the sphenoid bone, on which rests the pituitary gland, nearly to the level of the upper reaches of the superior poles of the thyroid gland. It would seem then that difficulty would be encountered in shielding not only the thyroid gland but also the hypophysis itself from the large doses of roentgen rays to which the thymus was subjected.

We mention these facts only because it has long been known¹² that extirpation of the thyroid gland gives rise to changes in the hypophysis which to us seem strangely similar to those described by Shay as the "physiologic castration" due to destruction of the thymus by roentgen rays.

Let us compare these descriptions. Shay^{1b} said: "The pituitary gland seems slightly enlarged, more in the male than in the female. And the anterior lobe is the part most involved. There is an increase in the number of basophils. They are enlarged and show irregularities in staining affinity. So-called castrate cells make their appearance. . . . Eosinophils seem normal, although possibly slightly decreased in number." On the other hand, from experiments on an entirely different organ (thyroid), Severinghaus, Smelser and Clark,¹³ in reviewing work by Simpson and Hunter,¹⁴ Marine,¹⁵ Trautmann,¹⁶ Bryant¹⁷ and Kojima¹² and also their own observations on pituitary changes resulting from removal of the thyroid gland, reported as follows: "Marked changes occur in the anterior lobe of the pituitary. The basophils are increased in number, are of maximum size, and give the pituitary the castrate appearance. Many have deeply chromatic elongated nuclei. Large numbers of typical castration cells are present." Certainly one might be justified in suspecting from these descriptions alone that the pituitary changes reported by Shay¹ might be in part due to unsuspected injury of the thyroid gland by the roentgen rays.

Furthermore, although in the literature available to us we were unable to find reports on the effects of removal of the thyroid gland at the early age at which the thymus experiment was undertaken, clinically it has often been demonstrated in cretins that there is a delay in growth of the sexual glands and accessories as well as in sexual maturation. With these observations in mind, the possibility cannot be excluded that effects other than those directly attributable to irradiation of the thymus gland might have contributed to the results reported by Shay and his co-workers.

12. Kojima, M.: Studies on the Endocrine Glands: 11. The Relations of the Pituitary Body with the Thyroid and Parathyroid and Certain Other Endocrine Organs in the Rat, *Quart. J. Exper. Physiol.* **11**: 319, 1917.

13. Severinghaus, A. E.; Smelser, George K., and Clark, Helen M.: Hypertrophy of the Pituitary Following Ablation of the Thyroid, *Proc. Soc. Exper. Biol. & Med.* **31**: 1127 (June) 1934.

14. Simpson, S., and Hunter, A.: The Possible Vicarious Relationship Between the Pituitary and Thyroid Glands, *Quart. J. Exper. Physiol.* **4**: 257, 1911.

15. Marine, David: The Present Status of the Functions of the Thyroid Gland, *Physiol. Rev.* **2**: 521 (Oct.) 1922.

16. Trautmann, A.: Hypophyse und Thyreoidectomie, *Frankfurt. Ztschr. f. Path.* **18**: 173, 1916; quoted by Severinghaus and his associates.¹³

17. Bryant, A. R.: The Effects of Total Thyroidectomy on the Structure of the Pituitary Gland in the Rabbit, *Anat. Rec.* **47**: 131, 1930.

10a. Since this article was submitted for publication on Feb. 8, 1939, additional data have been obtained making a total of twenty-four test animals with a similar number of controls. The results confirm the observations recorded.

11. Donaldson, H. H.: The Rat: Data and Reference Tables, ed. 2, *Memoirs of the Wistar Institute of Anatomy and Biology*, No. 6, Philadelphia, 1924.

SUMMARY AND CONCLUSIONS

Observations made on the effects of removal of the thymus gland from twelve male Wistar albino rats at the age of 25 days, and statistically compared with those on a similar group of controls, showed at 90 days that there were no mathematically significant changes in the length of the body and tail or in the weight of the body, head, hypophysis, adrenals, thyroid, testes and epididymides. The weekly increase in weight was not significantly altered. Microscopic sections of the testes of thymectomized animals showed no departure from the normal. Thymectomized animals between puberty and the age of 90 days were found to be capable of inseminating normal female animals.

Descriptions of the effects of ablation of the thymus by means of roentgen rays, as recorded by Shay and his co-authors, cannot be harmonized with the many reports of experimenters who surgically removed the gland. A partial review of the literature would suggest that the changes obtained by those employing roentgen rays might be due to injury to the thyroid gland.

TEMPORARILY POSITIVE KAHN AND
WASSERMANN REACTIONS

IN INFECTIOUS MONONUCLEOSIS: REPORT OF A CASE

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The fact that temporarily positive serologic tests for syphilis may occur in infectious mononucleosis without evidence of syphilis has been noted but is not generally recognized. Apparently the earliest notation of this finding was made in 1928 by Löhe and Rosenfeld,¹ who described what they termed "monozytenangina" in a housewife aged 40. In the light of present knowledge this case would seem quite compatible with the angiose variety of infectious mononucleosis. It was Weber,² however, who in 1930 first called attention to the fact that temporarily positive serologic tests for syphilis may occur in glandular fever. He reported three cases which all yielded transiently positive serologic reactions as evidenced by positive Wassermann or Meinicke tests. A year later Gooding³ described a series of twenty-seven cases (from the London epidemic of 1930) in which sixteen cases gave either a positive or an "incompletely" positive Wassermann reaction. Those cases which showed a negative Wassermann reaction were said in most instances to have yielded a positive Kahn reaction.

Radford and Rolleston⁴ have also reported two cases of glandular fever with positive Wassermann reactions, but syphilis does not seem to have been adequately excluded.

Bernstein⁵ in 1934 noted in two instances the association of a false positive Wassermann reaction with

increased heterophile antibody titer, though the Eagle flocculation tests were negative. In both patients the serums subsequently yielded negative Wassermann reactions on the twenty-fourth and fifty-eight day of disease respectively.

During the current year Hatz⁷ has reported a case of infectious mononucleosis with a transiently false positive Wassermann reaction, a negative Kline reaction and a sheep cell titer for heterophile antibodies not rising above 1:32.

Out of sixty cases of infectious mononucleosis observed at the Johns Hopkins Hospital during the past five years, Bernstein⁸ has recently collected six cases (including two cases previously reported) with temporarily false positive serologic reactions for syphilis. Of the sixty patients, thirty-seven had been given routine Eagle or Wassermann tests, the remainder not having been given serologic tests for syphilis.

In view of the clinical significance of these data it has seemed worth while to report the following case:

REPORT OF CASE

A student nurse, aged 23, admitted to the New Haven Hospital Jan. 10, 1938, complained of a cutaneous eruption.

Dec. 29, 1937, she had reported to the Nurses' Infirmary with an infection of the upper respiratory tract lasting two days. At that time she had complained of sore throat, swollen eyes, nasal discharge and slight general malaise. Elevation of temperature was minimal, reaching only 100 F. on the first day and falling to normal on the second day. January 9 the patient noticed a cutaneous eruption in the right antecubital fossa which, by the morning of January 10, had spread considerably. There were no other symptoms and she felt quite well. There was no history of syphilis and no reason to suspect that an acquired or congenital syphilitic infection existed.

On admission to the New Haven Hospital January 10 there was observed a rather faint morbilliform eruption over the neck, chest, abdomen, upper part of the back and in the right antecubital fossa. The anterior cervical nodes were enlarged and in both posterior cervical chains enlarged nontender nodes could be readily palpated, the enlargement being greater on the right than on the left. The temperature was 99.8 F. and the patient seemed quite comfortable and did not appear ill. The spleen was not palpable.

On admission the leukocyte count was 6,050 with 65 per cent lymphocytes. Among these were found a number of large cells, characteristic of those ordinarily present in infectious mononucleosis. The sheep cell agglutination test was positive in a dilution of 1:512. The Kahn reaction was 4+ and the Wassermann reaction was negative with the alcoholic antigen but 4+ with the cholesterinized antigen.

The patient's subsequent clinical course was quite satisfactory. She never felt particularly ill and she remained afebrile. The cutaneous eruption totally disappeared within twenty-four hours. The course of the sheep cell agglutination titer, the Kahn and Wassermann reactions and the blood counts are summarized in the accompanying table.

The enlargement of most of the cervical lymph nodes disappeared within a week after admission to the hospital, but several nodes could be palpated in the right posterior chain as late as February 5, and on March 5 a single node in the same chain was still palpable. February 5 a slight papular eruption over the forehead developed but subsided by March 5.

Agglutinations for various bacteria were done on the serum of February 5. There was no agglutination with the following antigens: *Eberthella typhi*, *Salmonella paratyphi*, *Salmonella schottmülleri*, *Eberthella paradysenteriae* (Flexner), *Eberthella dysenteriae*.

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1. Löhe, Heinrich, and Rosenfeld, Herbert: Ueber Monozytenangina mit anschließendem vorübergehendem Erythema nodosum, zugleich ein Beitrag zur Erythema nodosum, Erythema luetischer und nichtluetischer Angina, Dorn. (April) 1928.

2. Weber, F. P.: Glandular Fever and Its Lymphotropic Blood Picture—Sometimes Without Obvious Glandular Enlargement, M. Press (London) 130: 65-67 (July 23) 1930. Weber, F. P., and Bode, O. B.: Beitrage zum "Drüsenfieber," München. med. Wchnschr. 78: 1598-1600 (Sept. 18) 1931.

3. Gooding, S. E. F.: On Glandular Fever or Infectious Mononucleosis, Practitioner 127: 468-483 (Oct.) 1931.

4. Radford, Maitland, and Rolleston, J. D.: Two Cases of Glandular Fever Simulating Typhus, Lancet 2: 18-19 (July 5) 1930.

5. Bernstein, Alan: Antibody Responses in Infectious Mononucleosis, J. Clin. Investigation 13: 419-435 (May) 1934.

6. Eagle, Harry: Studies in the Serology of Syphilis: VIII. A New Flocculation Test for the Serum Diagnosis of Syphilis, J. Lab. & Clin. Med. 17: 787-791 (May) 1932.

7. Hatz, Bernard: The Wassermann Reaction in Infectious Mononucleosis with Report of a Case with Unusual Clinical Features, Am. J. Clin. Path. 8: 39-45 (Jan.) 1938.

8. Bernstein, Alan: False Positive Wassermann Reactions in Infectious Mononucleosis, Am. J. M. Sc. 196: 79 (July) 1938.

On admission the case was first regarded as one of German measles in that the cutaneous eruption, enlargement of the posterior cervical nodes and leukopenia seemed compatible with this diagnosis. But the presence of sheep cell agglutinins in high titer, the blood picture of January 10 and the fact that eruptions similar to this type are known to occur in infectious mononucleosis⁶ all pointed to the latter diagnosis rather than to that of German measles.

It is important to note that without the proper blood studies one would have seriously considered secondary syphilis in this case and might have begun immediate intravenous antisyphilitic therapy.

COMMENT

There are several unusual features in this case, namely the high and persistent titer for heterophile antibodies, the atypical clinical picture of infectious mononucleosis simulating German measles and the relatively long duration of the false positive Kahn and Wassermann reactions.

A titer of 1:4,096 for heterophile antibodies is higher than one ordinarily finds in infectious mononucleosis, and whether or not there is any relation between this and false positive Wassermann reactions is not clear. Bernstein⁶ has observed a sheep cell titer of 1:33,000 in a patient whose serologic reaction was negative while on the other hand in one of his cases presenting both positive Eagle and Wassermann reactions the sheep cell titer was only 1:64. In addition, the heterophile antibodies in Hatz's case⁷ never rose above a titer of 1:32.

Apparently, false positive serologic reactions for syphilis may appear in infectious mononucleosis as early as the first week of disease. They usually revert to negative some time during the third to the seventh week, though in the present case they did not become negative until the tenth week. The heterophile antibodies still persisted in high dilution even at this time, thus failing to show a parallelism with the course of the Wassermann reaction.

There has been no adequate explanation advanced for the cause or nature of the false positive reactions, and it is a phenomenon which deserves further investigation in view of the fact that one is dealing with a disease of unknown etiology. Partial removal of heterophile antibodies has no effect on the tests for syphilis, nor do the sheep cell titers necessarily parallel these tests.

It is also unknown whether cases of infectious mononucleosis with falsely positive Wassermann reactions fall into a special group, or, if not, how frequently they occur in the general run of infectious mononucleosis. In Gooding's group of cases from the London epidemic of 1930 the incidence was over 60 per cent. In Bernstein's series⁸ of sporadic cases the incidence of transiently positive Wassermann reactions was 16 per cent.

During the past seventeen years at the New Haven Hospital there have been observed forty-six admissions in which the diagnosis of infectious mononucleosis has been made. In thirty-seven of these cases either Kahn or Wassermann tests were done, with the result that three of these, including the present case, yielded positive results. Of the other two patients the first was a girl aged 8 years who was admitted on the eleventh day of disease. At that time the Wassermann reaction

was negative with the alcoholic antigen but 1 plus with the cholesterinized antigen. The second patient was a college student aged 20, admitted on the seventeenth day of illness. He had as a complication a severe Vincent's stomatitis. On the day of admission the Kahn reaction was 2+, the Wassermann reaction was negative with both the alcoholic and the cholesterinized antigen, and the sheep cell agglutination titer was 1:128. Unfortunately there is no record of serologic tests having been repeated in either of these first two cases. It seems reasonable to suppose, however, that in both instances the mechanism of the positive tests may have been similar to that observed in the third case, since no history of syphilis was obtained in either case and no congenital stigmas were present. If one considers that these three cases are similar, the present incidence of transiently (?) positive tests for syphilis in the series of cases at the New Haven Hospital is approximately 8 per cent, as contrasted with Bernstein's incidence of 16 per cent and Gooding's incidence of over 60 per cent. It should be emphasized, however, first that routine Wassermann tests were not done in

Blood Counts, Sheep Cell Agglutinations, Kahn and Wassermann Reactions

Date	Day of Disease	White Blood Cells	Lymphocytes, per Cent	Sheep Cell Agglutination Titer	Kahn Reaction	Wassermann Reaction	
						Alcoholic	Cholesterinized
1/10/38	13	6,050	65	1:512	4+	—	4+
1/12/38	15	7,300	53				
1/15/38	18	4,500	47	1:4,096	4+	—	4+
1/22/38	25	.....	..	1:2,048			
2/ 5/38	39	.....	..	1:512	2+	—	4+
2/11/38	45	7,050	28	1:512	1+	—	—
2/19/38	53	.....	..	1:512	1+	—	2+
3/ 5/38	70	.....	..	1:256	—	—	—
4/ 5/38	101	.....	..	1:256	—	—	—

our whole series; secondly, that serologic tests for syphilis were not repeatedly carried out, and, thirdly, that Kahn tests were usually done on admission during the very early stages of the disease. It seems possible, therefore, that more patients with positive reactions for syphilis might have been observed if blood tests had been repeated during the subsequent course of the illnesses described.

Capsule Formation and Virulence.—A characteristic of certain species and strains of bacteria which may well be regarded in some cases as a manifestation of adaptation to parasitic existence, as probably was first suggested by Babes, consists in the formation of a capsule. This structure in such organisms as the various types of pneumococci and Friedländer bacilli appears to be composed of various kinds of complex carbohydrate gums. That produced by the anthrax bacilli is described by Tomcsik as a protein or protein-like substance. It extends about the somatic portion of the bacterium and can be sharply differentiated from this vegetative body by suitable staining procedures. The experiments of Danysz were among the first to indicate a definite relationship between the formation of a capsule and virulence in pathogenic bacteria, and many subsequent studies have in the main served to establish this structure as being of great significance in permitting the survival of the bacterium in vivo. Its presence, nevertheless, cannot be taken as an infallible sign of an organism's capacity to cause disease, since a number of harmless encapsulated saprophytes are known.—Zinsser, Hans; Enders, John F., and Fothergill, LeRoy D.: *Immunity Principles and Application in Medicine and Public Health*, New York, Macmillan Company, 1939.

9. Tidy, H. L.: Glandular Fever and Infectious Mononucleosis, *Lancet* 2: 180-186 (July 28), 236-240 (Aug. 4) 1934.

VERTEBRAL FRACTURES PRODUCED
BY METRAZOL-INDUCED
CONVULSIONS

IN THE TREATMENT OF PSYCHIATRIC DISORDERS

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Convulsions induced by metrazol have been widely applied in the past few years in the treatment of mental disorders. At first limited to the treatment of schizophrenia, this therapy is now being employed for the affective disorders¹ and also for severe psychoneuroses.² Von Meduna³ in one of his early papers stated that, although the treatment was quite drastic, no inherent danger was involved. Occasional fractures of the long bones and dislocations have been reported.⁴ Recently

report by Wespi⁶ of a case of fracture of the seventh thoracic vertebra. It is our purpose to report a series of cases of treatment with metrazol in which compression fractures of the thoracic vertebrae were found in a very large percentage after the convulsions.

Attention was attracted to the spine when several patients complained of more or less severe backache, localized chiefly to the midthoracic region, after the convulsions. X-ray examination of the spine disclosed compression fractures of the bodies of the vertebrae. Therefore all available patients who had received metrazol therapy, whether they had complained of backache or not, were examined by means of roentgenograms. Recently, in order to eliminate the possibility that the fracture may have existed prior to treatment, we have in several instances examined the spine before treatment and found it normal, whereas after the convulsions fractures were demonstrated by roentgenograms.

Convulsions induced by metrazol were utilized in the treatment of fifty-eight psychiatric patients, twenty-three males and thirty-five females. Of these, fifty-one (twenty males and thirty-one females) were available for examination. The youngest patient treated was 15 and the oldest 50, the average age for the entire group being 28.7 years. Fractures were found in a total of twenty-two (43.1 per cent) of the patients examined, of whom six were males (30 per cent) and sixteen females (51.6 per cent). The fractures were all found in the thoracic vertebrae and were most common in the mid-thoracic region. The number of segments affected varied from one to eight and averaged between three and four. Table 1 lists in detail the observations in the fifty-eight cases and includes the mental diagnoses and the number of metrazol convulsions. Table 2 summarizes the results of the x-ray examinations.

REPORT OF CASES

CASE 31.—C. G., a white woman aged 28, single, admitted to the Psychiatric Institute Dec. 16, 1938, with a manic-depressive psychosis, depressed type, of three months' duration, was well nourished, of asthenic habitus and normal on physical and laboratory examination. Roentgenograms of the thoracic part of the spine Jan. 10, 1939, showed no bone or joint abnormalities. January 11 the injection of 3 cc. of 10 per cent solution of metrazol, followed fifteen minutes later by 4 cc., produced only petit mal attacks. January 13 the injection of 5 cc. followed fifteen minutes later by another 5 cc. produced only petit mal attacks. January 15, 6 cc. elicited only a petit mal attack. January 18, 7 cc. produced a generalized convulsion resembling an epileptiform attack. Later that day the patient complained of moderate pain in the midthoracic region of the back. Stereoscopic x-ray films of the thoracic part of the spine taken the same day showed compression fractures of the bodies of the fourth and sixth thoracic vertebrae and suggestive but less convincing evidence of an injury to the fifth (fig. 1).

CASE 32.—G. L., a white woman aged 28, single, admitted to the Psychiatric Institute Nov. 16, 1938, with a manic-depressive psychosis, depressed type, of six months' duration, was well nourished, of pyknic habitus and normal on physical and laboratory examination. Roentgenograms of the thoracic and upper lumbar parts of the spine Jan. 10, 1939, revealed no bone or joint abnormalities. January 11 the injection of 4 cc. of a 10 per cent solution of metrazol produced a generalized

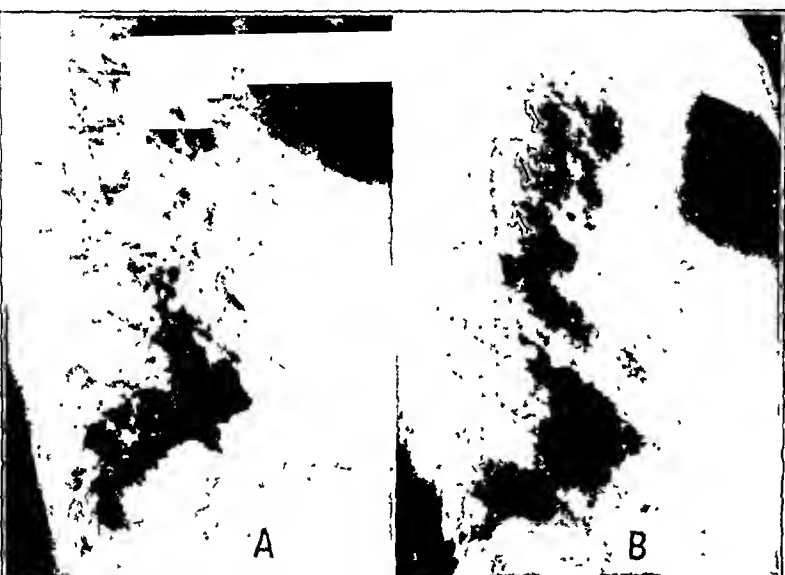


Fig. 1 (case 31).—A, taken before the convulsion, reveals no abnormalities. B, taken after the convulsion reveals compression fractures of the fourth and sixth thoracic vertebrae and possible injury to the fifth.

von Meduna and Friedman⁵ compiled statistics from various sources with regard to the "mechanical" complications, which include dislocations and fractures of the extremities. They did not include the numerous temporomandibular dislocations which undoubtedly occur but which are reduced without difficulty or sequelae. They reported an incidence of 1.1 per cent of such "mechanical" complications. A survey of the literature discloses no reference to vertebral injuries as the result of metrazol therapy except the recent

From the New York State Psychiatric Institute and Hospital and Columbia University College of Physicians and Surgeons.
1. Young, R. H., and Young, G. A.: Treatment of the Psychoses with Induced Hypoglycemia and Convulsions, *J. A. M. A.* 112:496-499 (Feb. 11) 1939.
2. Low, A. A.; Sonenthal, I. R.; Blaurock, M. F.; Kaplan, Maurice, and Sherman, Irene: Metrazol Shock Treatment of the "Functional" Psychoses, *Arch. Neurol. & Psychiat.* 39:717-736 (April) 1938.
3. von Meduna, Laszlo: Die Konvulsionstherapie der Schizophrenie, *Psychiat.-Neurol. Wehnschr.* 37:317-319 (July 6) 1935.
4. Beckenstein, Nathan: Results of Metrazol Therapy in Schizophrenia, *Psychiatric Quart.* 13:106-113 (Jan.) 1939. Winkelman, N. W.: Metrazol Treatment in Schizophrenia, *Am. J. Psychiat.* 95:303-316 (Sept.) 1938.
5. von Meduna, Laszlo, and Friedman, Emerick: The Convulsive-Irritative Therapy of the Psychoses, *J. A. M. A.* 112:501-509 (Feb. 11) 1939.

6. Wespi, Hans: Ein Fall von spontaner Wirbelfraktur im Cervicobereich, *Schweiz. Arch. f. Neurol. u. Psychiat.* 42:404-406, 1938.

epileptoid convulsion, which was repeated January 13 with the same dose. Later that day the patient complained of moderate pain in the midthoracic region of the back. Stereoscopic x-ray films of the thoracic part of the spine taken the same day showed evidence of compression fractures of the fifth, sixth, seventh, eighth and ninth thoracic vertebrae.

COMMENT

The technic of administering metrazol to induce convulsions in these patients was only slightly modified from that described by Meduna,³ in that a smaller initial

injury from external causes, such as falling out of bed or striking the body against the wall or the headboards or footboards of the bed during a convulsion. The patients were under constant observation until they were fully conscious and in complete contact with their surroundings. This procedure is similar to that recently advocated by Meduna and Friedman.⁵

We have found that the pattern of the convulsion induced by metrazol is similar to that described by Finkelman, Steinberg and Liebert.⁷ In general, from

TABLE 1.—Vertebral Fractures Following Metrazol-Induced Convulsions in Psychiatric Patients

Case No.	Name	Age	Diagnosis	X-Ray Report*	Backache	No. of Convulsions	Maximum Dose of Metrazol, Cc.
Female Patients							
1	S. B.	30	Manic-depressive psychosis; agitated, depressed.....	No fracture	None	3	5
2	G. C.	17	Schizophrenia	T6-7-8	None	19	7
3	L. C.	25	Schizophrenia	T7-8	Mild	3	4
4	D. C.	26	Schizophrenia	Not available for x-ray examination	None	23	6
5	A. C.	43	Manic-depressive psychosis; depressed.....	No fracture	Mild	5	7.5
6	R. D.	30	Psychoneurosis; anxiety and depression.....	No fracture	Mild	5	6
7	F. E.	43	Involution melancholia	No fracture	Moderate	18	6
8	B. F.	30	Schizophrenia	Not available for x-ray examination	Moderate	3	5
9	M. G.	17	Schizophrenia	No fracture	Mild	5	7
10	C. G.	27	Agitation and depression with schizophrenic features.....	T4-5-6-7-8	Severe	6	7
11	L. G.	26	Schizophrenia	No fracture	Severe	15	8
12	B. H.	30	Schizophrenia	Not available for x-ray examination	Moderate	14	7
13	M. J.	27	Manic-depressive psychosis; depressed.....	T7-8	None	4	7
14	M. K.	18	Manic-depressive psychosis; depressed.....	T5-6-7-8	Moderate	2	4
15	D. K.	22	Schizophrenia	No fracture	None	22	8.5
16	R. L.	24	Schizophrenia	T5-6-7-8-9	Moderate	25	10.5
17	M. M.	26	Schizophrenia	No fracture	None	12	6.5
18	M. M.	23	Schizophrenia	No fracture	None	12	4.5
19	H. O.	33	Manic-depressive psychosis; depressed.....	T6-7-8	Severe	1	3
20	J. Q.	33	Schizophrenia	T5-6-7-8-9-10-11-12	Moderate	6	7
21	A. R.	28	Manic-depressive psychosis; depressed.....	No fracture	None	2	3
22	D. R.	22	Schizophrenia	Not available for x-ray examination	Moderate	3	6
23	F. S.	41	Schizophrenia	T5-6-7-8	None	7	0
24	A. S.	27	Manic-depressive psychosis; depressed.....	T6-7-8	None	7	5
25	Y. S.	22	Manic-depressive psychosis; agitated, depressed.....	T5-6-9	Severe	21	7
26	B. S.	18	Schizophrenia	T4-5-6-7-8	Severe	21	6.5
27	F. S.	35	Manic-depressive psychosis; depressed.....	No fracture	None	3	5
28	M. W.	30	Manic-depressive psychosis; depressed.....	No fracture	None	1	4
29	T. W.	32	Schizophrenia	T5-6-7-8-9	Severe	10	5
30	L. W.	19	Schizophrenia	T4-5-6-7	Mild	13	5
31	C. G.	28	Manic-depressive psychosis; depressed.....	T4-5-6†	Moderate	1	7
32	G. L.	28	Manic-depressive psychosis; depressed.....	T5-6-7-8-9†	Moderate	2	4
33	E. W.	33	Manic-depressive psychosis; depressed.....	No fracture†	None	3	4.5
34	E. W.	23	Schizophrenia	No fracture	None	10	6
35	A. S.	20	Schizophrenia	No fracture	None	20	6.5
Male Patients							
36	C. P.	50	Involution melancholia	No fracture	Mild	4	10
37	H. J.	30	Schizophrenia	No fracture	None	10	7
38	I. C.	24	Manic-depressive psychosis; depressed.....	T6	None	8	7
39	L. S.	20	Psychoneurosis; obsessive-compulsive	No fracture	None	9	8
40	S. M.	21	Schizophrenia	T5-6-7-8-9	None	10	6
41	E. K.	32	Depression	No fracture	None	11	8
42	E. P.	21	Psychoneurosis; anxiety and depression.....	No fracture	None	1	5
43	E. J.	32	Schizophrenia	No fracture	None	12	11
44	E. B.	37	Psychoneurosis; obsession and depression.....	No fracture	None	1	5
45	A. F.	34	Schizophrenia	No fracture	None	9	6
46	A. S.	15	Schizophrenia	Not available for x-ray examination	Mild	5	8
47	S. N.	40	Manic-depressive psychosis; depressed.....	T5-6-7	None	6	7
48	W. P.	24	Psychoneurosis; obsession and depression.....	No fracture	None	0	7
49	H. B.	36	Psychoneurosis; obsession and depression.....	No fracture	None	0	7
50	N. S.	21	Manic-depressive psychosis; circular.....	No fracture	None	10	5
51	M. P.	22	Schizophrenia	No fracture	None	15	8
52	C. P.	31	Schizophrenia	Not available for x-ray examination	None	22	11.5
53	H. K.	24	Schizophrenia	No fracture	None	14	5
54	B. S.	33	Schizophrenia	T7-8-9	None	5	10
55	H. M.	22	Schizophrenia	No fracture	None	8	9
56	M. H.	43	Manic-depressive psychosis; depressed.....	T3-4-5-6	None	7	9.5
57	E. A.	40	Manic-depressive psychosis; depressed.....	T4	None	9	5
58	H. C.	41	Involution melancholia	Not available for x-ray examination	None	6	11

* The letter T and the number represent a compression fracture of the corresponding thoracic vertebra.

† A roentgenogram taken prior to metrazol therapy revealed no fracture.

dose (3 cc. or, rarely, 4 cc. of a 10 per cent solution) than the 5 cc. advocated by him was given intravenously. The majority of convulsions occurred with a dose of from 4 to 6 cc. Later in our treatment, if a convulsion was not produced another injection of 1 cc. more than the original amount was given in fifteen minutes. If this did not elicit a grand mal attack, treatment was discontinued for that day. A similar procedure was used on subsequent treatment days, the dose being increased 1 cc. until a convulsion was attained. Treatments were given twice or, more often, three times weekly. The maximum dose of metrazol used was 11.5 cc. We wish to emphasize that none of our patients received any

five to ten seconds after the intravenous injection of metrazol, convulsive movements began in the face, shoulders and arms; these were followed quickly by a rhythmic clonic phase. In about fifteen seconds a tonic phase ensued. The head was retracted and the body was held rigid. This phase lasted from five to thirty seconds and was followed by another clonic phase, during which the spine was repeatedly flexed. It is possible that the vertebral injuries occur during this phase of the convulsion.

7. Finkelman, Isidore; Steinberg, D. J., and Liebert, Erich: Treatment of Schizophrenia with Metrazol by Production of Convulsions. J. A. M. A. 110:706-709 (March 5) 1938.

In our series there was no relationship between the total number of convulsions and the appearance of the fractures or the number of vertebrae affected. Several patients sustained fractures after one or two convul-

TABLE 2.—Summary of Vertebral Fractures in Metrazol-Treated Patients

	Male	Female	Total
No. of patients treated	27	35	58
No. of patients examined roentgenographically	20	31	51
No. of patients with vertebral fractures	6	16	22
Percentage of patients with vertebral fractures	30.0	51.6	43.1

sions, while others showed no evidence of injury after eighteen or twenty-two seizures.

In order to indicate that in all probability these fractures did not result as a consequence of any peculiarity in our technic or dosage, we wish to cite a case recently observed at this hospital but not included in our series. The patient had had two metrazol-induced convulsions

direction and wedge formation were often seen. In several instances the compression of the body was marked, resulting in a shortening of the vertical diameter to about one half its normal height. Moderate kyphosis and scoliosis were noted in a number of cases as a concomitant deformity.

The fractures of the bodies of the vertebrae were probably caused by the action of the muscles of the spine and trunk. The preponderance of fractures of the anterior portions of the vertebral bodies suggests that they are produced by sudden anterior flexion of the spine. Similar fractures after the spasms of tetanus have previously been reported.⁸ Roberg⁹ called attention to the bending force of the powerful spinal flexors and the relatively weak opposing extensors in producing compression fractures of the anterior portions of the midthoracic vertebrae in tetanus.

Although the complication of vertebral fracture is serious, our observations tend to agree with the pub-



Fig. 2 (case 26).—A white girl aged 18, with schizophrenia, had twenty one metrazol-induced convulsions. A roentgenogram then revealed compression fractures of the fourth, fifth, sixth, seventh and eighth thoracic vertebrae.



Fig. 3 (case 29).—A white woman aged 32, with schizophrenia, had ten metrazol-induced convulsions. A roentgenogram then revealed compression fractures of the fifth, sixth, seventh, eighth and ninth thoracic vertebrae.



Fig. 4 (case 19).—A white woman aged 33, with a manic depressive psychosis of the depressed type, had one metrazol induced convulsion. A roentgenogram then revealed compression fractures of the sixth, seventh and eighth thoracic vertebrae.

at another institution. On his admission to the Psychiatric Institute, compression fractures of the seventh, eighth, ninth and tenth thoracic vertebrae were found on the roentgenograms.

In general the degree of injury bore no relationship to the intensity of the subjective complaint of backache. Many patients who complained of pain in the back did not present any demonstrable vertebral fractures, whereas others with fractures, especially male patients, did not complain of pain. There did not appear to be any direct relationship between the occurrence of fracture and the habitus or age of the patient. All our patients were physically healthy and well nourished, stemming from the middle class of society, and showed no evidence of nutritional disturbance.

The most frequently affected segments were in the midthoracic region. In the roentgenograms, the appearance of the fractures varied. Fragmentation and compression of the anterior portion of the upper surface of the body was most common. In about half the cases the fractures manifested themselves only by a slight forward displacement of a disklike fragment of the upper portion of the body. Flattening in the vertical

lished reports of the efficacy of metrazol therapy in the treatment of psychiatric disorders. To prevent this complication, we are investigating a method whereby the patient is placed on his side and acutely flexed, the metrazol being injected while he is in this position. It is hoped thereby to reduce the sudden flexions of the spine which may be the cause of the vertebral injuries. We have had too few patients treated in this new position to report regarding its effectiveness.

SUMMARY AND CONCLUSIONS

- 1. In fifty-one cases of psychiatric disorders in which metrazol was used to produce convulsions, x-ray examinations of the thoracic part of the spine were subsequently performed.
- 2. These examinations revealed compression fractures of the vertebrae in 43.1 per cent of the cases. The incidence was higher in female patients than in male.
- 3. In most instances the fractures were multiple.

8. Chasin, Adib. Ueber Veränderungen in der Wirbelsäule erst Tetanus. Fortschr. a. d. Geb. d. Röntgenstrahlen 46: 427-441 (1932).
Zukschwerdt, L., and Axtmann, R.: Wirbeleränderungen bei Wundstarrkrampf. Deutsche Ztschr. f. Chir. 238: 627-634, 1933.
9. Roberg, O. T., Jr.: Spinal Deformity Following Tetanus and Its Relation to Juvenile Kyphosis. J. Bone & Joint Surg. 19: 693-699 (1937).

4. It is probable that these fractures are produced by acute anterior flexion of the spine, which occurs during the convulsion induced by metrazol.

5. In view of the beneficial effects of metrazol in the therapy of mental diseases, attempts are being made to avoid this complication.

722 West 168th Street.

Clinical Notes, Suggestions and New Instruments

PURPURA HAEMORRHAGICA FOLLOWING USE OF SEDORMID

TWO ATTACKS IN ONE PERSON

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Cases of purpura haemorrhagica after the use of sedormid (allyl-isopropyl-acetyl-carbamide) have been reported with increasing frequency since 1933. Jockes¹ reviewed the literature on this subject and stated that there were to date thirty-seven reported cases of purpura haemorrhagica due to sedormid. Since the period covered by his recent survey, seven more cases have been added to the literature.² It is interesting to note that on March 5, 1938, the Council on Pharmacy and Chemistry of the American Medical Association³ declared sedormid not acceptable for New and Nonofficial Remedies. Also of the twenty recorded observers, only four are Americans.⁴ In view of this we feel that it might be pertinent to describe a recent case of severe purpura haemorrhagica with two separate episodes due to this sedative.

REPORT OF CASE

A white woman aged 57 complained of multiple subcutaneous hemorrhages, which she had noticed on finishing her housework that evening. No injury had been sustained to account for the condition. Her legs, thighs, arms, body and mouth had hundreds of hemorrhages ranging in size from petechial spots to areas 6 cm. in diameter. Many of these larger areas were raised from 2 to 3 mm. in height; none were painful when touched. The hemorrhages in the mucous membrane of the mouth were of two varieties, some being flat and others pedunculated. The heart and lungs were normal; the abdomen, liver and spleen were not palpable. A capillary fragility test⁵ produced 100 petechial hemorrhages in five minutes, and the entire forearm and hand became hemorrhagic. The clinical impression was of aplastic anemia, scurvy or idiopathic purpura.

When she was hospitalized early the next morning the areas had increased in size, a large hematoma was present on one elbow and she was spitting blood. A vitamin C saturation test⁶ gave a normal result, 625 mg. (of 1,000 mg. given intravenously) being excreted in five hours. X-ray studies of the extremities for evidence of subperiosteal hemorrhages gave negative results.

No new hemorrhages appeared after her entrance into the hospital, which was concomitant with the large dose of vita-

min C. Since she had shown a general avitaminosis a year before and because she had a habit of taking sedatives for insomnia, the possibility suggested itself that the excretion of dietary vitamin C had been accelerated by some drug (acetyl-salicylic acid, for one, has been reported to cause depletion of vitamin C reserves⁷). For this reason 1,000 mg. of crystalline vitamin C (cebone-Merck) was given in 10 cc. of water intravenously each day. No other medication was administered. Studies of the blood made almost daily are presented in the table.

Questioning about self-prescribed medicine brought the information that the patient had taken one-half tablet of sedormid nightly for several months, with no ill effects. After a lapse of about a month she took a whole tablet the night before the onset of purpura. She recalled that she soon became acutely ill, with chills, fever and excessive thirst. A sleepless night was followed by a raging headache the next morning. Feeling better later, she had been astonished on changing her clothes in the evening to find her skin spotted with hemorrhages.

After a week's hospitalization, when her blood platelets had started to increase and her hemorrhages to disappear, the patient was discharged. Because sedormid was suspected of being the cause of her illness, it was not readministered for fear of recurrence.

Two months later she again took one-half tablet of sedormid at bedtime. Within two hours chills and fever were experienced, and her stomach "felt as if it were stretching." The next day

Studies of the Blood

Day of illness	1st	3d	4th	6th	7th
Red blood cells (per cubic millimeter)	3,760,000	4,236,000	3,870,000	3,990,000	4,230,000
White blood cells (per cubic millimeter)	4,900	3,750	3,850	3,850	4,150
Platelets (per cubic millimeter)	90,000	54,000	52,000	110,000	140,000
Hemoglobin, %	86	79	74	80	82
Color index	1.11	.86	.88	.96	.80
Bleeding time (minutes)...	5	4	3	2 to 3	2½ to 3
Coagulation time (minutes)	6½	5½	5	4½	4½ to 5
Differential count (per 100):					
Neutrophils	62.5	36	47	36	38
Eosinophils	1.5	6	3	2	2
Basophils	2	0	0	0	1
Monocytes	2.5	4	5	5	6
Small lymphocytes	29.5	52	42	54	48
Large lymphocytes	2	2	3	3	5

her mouth was filled with hemorrhages, so that she was spitting blood continuously. There was oozing from the nose, and scattered over her body were approximately 300 petechial hemorrhages. Several large ecchymotic areas, all less than 2.5 cm. in diameter, appeared over the elbows and thighs. Two days later more hemorrhages appeared on the extremities. She was ashen colored and appeared ill. As she now refused intravenous injections, oral doses of 1,000 mg. of vitamin C were given daily. It required three weeks for the areas to disappear. At the present time, one month after the recurrence, she has residual stiffness of her knees, which may have been caused by hemorrhage into the joints.

COMMENT

While it is probable that many persons have suffered no ill effects from sedormid, a study of forty-five cases of purpura haemorrhagica following its use should cause real concern. The different stages at which illness may appear are of interest. Of the persons in whom purpuric manifestations developed, the majority indicated an allergotoxic reaction, since they had taken it for some time with no untoward effects, only to show hemorrhages when they resumed it after varied lapses of time. In another group apparently an intolerance for it developed, purpura appearing after a period of continued use. A still smaller number of persons who are reported to have reacted to their first dose seemed to have an idiosyncrasy for this drug. In all cases there was a strikingly similar clinical picture, followed generally by complete recovery on withdrawal of sedormid. In one instance, however, a psychosis was reported to have followed the disappearance of visible symptoms, and in the reported case

7. Daniels, A. L., and Everson, G. J.: Influence of Acetylsalicylic Acid (Aspirin) on Urinary Excretion of Ascorbic Acid, *Proc. Soc. Exper. Biol. & Med.* 35: 20 (Oct.) 1936.

From the Department of Medicine, New York Post-Graduate Medical School and Hospital, Columbia University.

1. Jockes, T.: Purpura Haemorrhagica (Werlhof) after Taking Sedormid, *Lancet* 2: 305 (Aug. 6) 1938.

2. Vogt, Alfred: Die Pathogenese der akuten thrombopenischen Purpura, *Wien. Arch. f. inn. Med.* 92: 273 (May) 1938. Loewy, F. E.: Thrombocytopenic Purpura from Sedormid, *Brit. M. J.* 2: 320 (Aug. 6) 1938. Miller, Charles, and Rosenheim, M. L.: Purpura After Taking Sedormid, *Lancet* 2: 402 (Aug. 13) 1938.

3. Sedormid not Acceptable for N. N. R., report of the Council on Pharmacy and Chemistry, *J. A. M. A.* 110: 740 (March 5) 1938.

4. Vogel, A.: Purpura Haemorrhagica Following the Use of Allyl-Isopropyl-Acetyl-Carbamide, *abstr. J. A. M. A.* 105: 612 (Aug. 24) 1935. Boas, E. P., and Erf, L. A.: Thrombocytopenic Purpura Following Medication with Sedormid and with Phenobarbital, *New York State J. Med.* 36: 491 (April 1) 1936. Hoffman, A. M.; Kahn, Julius, and Fitzgibbon, J. P.: Thrombocytopenic Purpura Following Allyl-Isopropyl-Acetyl-Carbamide (Sedormid), *J. A. M. A.* 110: 725 (March 5) 1938. Moody, A. M.: Thrombocytopenic Purpura Following Use of Allyl-Isopropyl-Acetyl-Carbamide (Sedormid), *ibid.* 110: 726 (March 5) 1938. Since this paper was submitted, two more cases have been reported (Hill, David B.: Thrombocytopenic Purpura Following Allyl-Isopropyl-Acetyl-Carbamide (Sedormid), *J. A. M. A.* 111: 1459 (Oct. 15) 1938.

5. Wright, I. S., and Lilienfeld, Alfred: Pharmacologic and Therapeutic Properties of Crystalline Vitamin C (Cevitamine Acid), with Especial Reference to Its Effects on the Capillary Fragility, *Arch. Int. Med.* 57: 241 (Feb.) 1936.

6. Wright, I. S.; Lilienfeld, Alfred, and MacLenathan, Elizabeth: Determination of Vitamin C Saturation, *Arch. Int. Med.* 60: 264 (Aug.) 1937.

there is residual stiffness of the knees. One is led to speculate, therefore, on the possibility of such serious manifestations as may result from lesions in the brain and other important areas.

CONCLUSION

Evidence accumulated by various authors over five years demonstrates that sedormid may cause a serious hemorrhagic syndrome. This emphasizes the need for further study of its properties, restriction of its sale except on a physician's prescription and caution on the part of the physician in recommending its use.

A SIGN OF ULNAR PALSY

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It seems to me worth while to point out the diagnostic importance of a sign of ulnar palsy that is apparently little known and is not even mentioned, for example, in the leading textbooks of neurology or in monographs on the peripheral nerves. This sign consists of a position of abduction assumed by the little finger. For years I have been observing this sign and have found it to be present in many cases, regardless of the cause of the palsy.¹

Sometimes the fourth finger too has a tendency to assume a position of abduction, but usually it is only the little finger that is found in an abnormal position. In many cases this abduction was nearly extreme and resembled a paralytic contracture. It was found to be most conspicuous when the patient was asked to extend his fingers at the proximal joints. The importance of this sign has become increasingly evident from numerous experiences which indicate that this tendency of the little finger to be abducted may constitute an early (in some cases the first) and also a late sign of ulnar palsy.

It is my definite impression that from this point of view the sign deserves special attention. To illustrate this, the case of an intelligent female patient who had a slowly developing ulnar palsy is cited. This patient reported that the first thing she had noticed in respect to her hand was a tendency of the little finger to deviate outward. In other cases this deviation outward of the little finger has been noticed together with the beginning of paresthesias in the fourth and fifth fingers.

To show the importance of this sign as a very late manifestation of ulnar palsy, another case may be cited—that of a physician who fourteen years ago suffered a severe traumatic right-sided ulnar palsy. In the course of time all the signs of this palsy (atrophies, paralyses, sensory changes) completely subsided. In this case the abducted position of the little finger is now the only remaining demonstrable sign of an ulnar palsy sustained fourteen years ago. Recently I saw a patient who had been operated on for late ulnar palsy successfully by Dr. H. C. Naffziger fourteen years ago. In this case the position of abduction of the little finger has been the outstanding clinical feature.

From the physiologic standpoint this sign is easily understandable. Adduction of the little finger is performed by the interosseous and abduction by the hypothenar muscles. Both groups of muscles are innervated by the ulnar nerve. However, in abduction of the little finger, the musculus extensor digiti minimi proprius and the branch to the little finger of the musculus extensor digitorum communis also play a definite part. These are both innervated by the nervus radialis. If the muscles innervated by the ulnar nerve are weak, those innervated by the intact nervus radialis predominate in strength and abduct the little finger. Thus it is understandable why this abduction of the little finger in ulnar palsy is best seen when the musculus extensor digitorum communis comes into action and extends the fingers and the hand. In cases of combined palsy of the nervus ulnaris and nervus radialis this sign would not be present. Normally the spreading of the fingers and abduction of the little finger is much more forcefully performed with the fingers extended than with the fingers flexed. In ulnar palsy this difference is much more pronounced in the little finger. This proves again the importance of the extensors of the little finger in the mechanism of its abduction.

Borchardt² described a case of ulnar palsy in which he assumed that only the musculus abductor digiti quinti was preserved. Foerster cited this case as a proof that this muscle was innervated by the nervus medianus. Foerster³ presented a photograph made in a case of disease of the nervus ulnaris in which there was marked abduction of the fifth finger. He stated that in this case all the muscles of the hand that normally are innervated by the nervus ulnaris were innervated by the nervus medianus, except for the musculus interosseus volaris tertius (adductor digiti quinti).

These two explanations of the phenomenon are based on the supposition that the median nerve in these cases innervated the muscles usually regarded as innervated by the nervus ulnaris. Aside from the fact that this must occur only exceptionally, such an explanation does not come into consideration in my cases, in which the picture was in every way typical and there was no other evidence of innervation by the nervus medianus as a substitute for the nervus ulnaris. There was typical involvement of all the muscles normally innervated by the nervus ulnaris.

In another case of abduction of the little finger in ulnar palsy Foerster³ assumed that, after the ulnar nerve had been affected, all the muscles had been restored to normal except the musculus abductor digiti quinti. The isolated palsy of this muscle had thus led to an abducted position of the little finger. This explanation by Foerster seems to me a little far fetched, as it is not understandable how, after all of the other muscles controlled by the nervus ulnaris had been restored, one would remain affected for many years.

My explanation appears more simple and adequate. I assume that abduction of the little finger in ulnar palsy is due to the predominance of the musculus extensor digiti quinti and the branch of the musculus extensor digitorum communis to the little finger over the muscles innervated by the nervus ulnaris which adducts the finger. Thus it is not necessary to resort to the extraordinary supposition that in ulnar palsy only the adductor digiti quinti may be involved or fail to be restored, or that the abductor digiti quinti has been spared. My explanation is supported by the strong influence of the extensors of the fingers on their abduction in cases of slight ulnar palsy, the abduction of the little finger becoming more than usually enforced when the fingers are extended, i. e., when the extensors come into play.

With regard to the use of this sign in differential diagnosis, it is worth while mentioning that Hoff and Schilder⁴ found, in cases of cerebellar disease and of beginning multiple sclerosis with cerebellar lesions, this same tendency of the little finger to abduction.

USE OF SERUM TELLURITE AGAR FOR THE ISOLATION OF PNEUMOCOCCI

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Serum tellurite agar,¹ which is used as a routine in this laboratory for the examination of cultures taken from the throat and nose for *Corynebacterium diphtheriae*, has been found very satisfactory for the isolation of pneumococci.

On this medium practically all strains of pneumococci produce very characteristic colonies. The colonies, which vary in size from 0.1 to 1 mm. in diameter, are very thin and flat, appear and gray with a brownish gray center. Some give the appearance of having a raised edge and a depressed center. Recently isolated and virulent type III pneumococci produced large (from 3 to 4 mm.), raised, watery, mucoid, light gray colonies. While the morphologic appearance of the colonies of pneumococci on this medium is very much like that produced on ordinary blood

2. Borchardt, cited by Foerster.³
3. Foerster, O. Friedl, in Lewandowsky, Max: *Handbuch der Neurologie, Ergänzungsband*, Berlin, Julius Springer, 1929, pt. 2, p. 1132.

4. Hoff, Hans, and Schilder, Paul: *Phänomen des kleinen Fingers*. Deutsche med. Wchnschr. 54: 1200 (July 20) 1928.

From the Bureau of Bacteriology, Maryland State Department of Health.

1. Dissolve 1.5 g. of tellurite agar in beef infusion broth. Adjust hydrogen ion concentration to 7.2 and 7.4, bottle in convenient amounts, sterilize in the autoclave at 15 pounds pressure for twenty minutes. Melt this base in a sterilizer when ready to use and cool to 50 C. Add 5 per cent sterile human or hog serum, 0.2 per cent of dextrose from a sterile solution (2 cc. of a 10 per cent dextrose solution to 100 cc. of base) and 0.01 per cent of potassium tellurite (1 cc. of a 1 per cent sterile solution). Pour into Petri dishes.

agar, the pneumococcus colonies are easily distinguished from those of streptococci. The colonies are not always typical, however, until the plates have been incubated for twenty-four hours.

In general, streptococci produce raised, black colonies on serum tellurite agar. Certain strains of hemolytic streptococci which produce large mucoid colonies are difficult to distinguish from the colonies of type III pneumococci. The mucoid streptococcus colonies are, however, darker than pneumococcus colonies and do not usually have an entire edge. The tellurite medium has the added advantage that proteus-like and spore-forming bacteria do not produce spreading colonies.

This method has been found to facilitate greatly the routine isolation of pneumococci from mixed cultures.

2411 North Charles Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE.

HOWARD A. CARTER, Secretary.

FEVER THERAPY BY PHYSICAL MEANS

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AND

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During the past few years, interest in the production of fever by physical means has greatly increased. More than 600 articles have been written and published on the subject. Excellent research work has been done, and conservative scientific conclusions have been drawn. The value of fever therapy as an important therapeutic agent in the treatment of certain diseases has been definitely proved.

The treatment of more than fifty diseases by means of artificial fever therapy has been attempted. The results in the majority of these diseases were not encouraging, although with a selected few the method has given promise of great usefulness. It must be emphasized, however, that fever therapy is probably of little or no value in the treatment of many diseases concerning which its use has been studied, and in some diseases it may even become dangerous.

GENERAL PRINCIPLES

Numerous studies on the effects of fever produced by physical means indicate that these effects produce certain definite changes in the body.

Effects on Circulation.—The pulse and circulatory rates are increased by fever therapy, and both the volume output of the heart and the velocity of the blood may be increased by as much as 400 per cent. There is an initial increase which is followed by a decrease in the pulse pressure. There is a marked increase in the pulse volume in the fingers of the patient in all types of artificial fever with the exception of that caused by foreign proteins. It has been suggested that the vasodilatation which occurs during fever produced by foreign protein is possibly of central origin, whereas that which occurs in artificial fever induced by external heating, with consequent prevention of loss of heat, is chiefly of peripheral origin.

The maximal increase of circulation in artificial fever occurs, in general, at temperatures between 103 and 104 F. (39.4 and 40 C.). Alterations appearing in the electrocardiogram are not uniform. The electro-

cardiograms show disappearance of the normal sinus arrhythmia, and the cardiac rhythm becomes remarkably regular. The conduction time (PR interval) is shortened about 0.02 to 0.06 second during the elevation of bodily temperature, being shortest at 105 F. The conduction rate concomitantly slows to its former velocity as the temperature falls.

Studies made by means of sphygmograms, phlebograms and electrocardiograms of patients undergoing fever treatments indicate that the total filling time of the ventricle is rapidly reduced by the time the temperature is elevated to 100.5 F. and reaches its lowest figure at 103.5 F. After this, the filling time increases slightly, so that it again becomes greater than the emptying time.

The curves illustrating filling times suggest that both the distressing symptoms and the subjective discomfort often experienced by patients during the induction of artificial fever might be accounted for by an inadequate filling of the heart because of an insufficient duration of the filling time. Compensation may be accounted for by a more adequate ventricular filling brought about by an increase in the duration of the filling time.

There is little or no change in the volume of the blood and no change in the viscosity of the blood when the intake of fluids is encouraged during the fever sessions. Artificial fever unaccompanied by sweating does not of itself bring about any considerable change in the blood volume, but when fever is accompanied by profuse perspiration, the reduction in blood plasma may be so great as to produce peripheral vascular collapse.

Absorption of fluids from the intestinal tract may be retarded during high fever, but the intravenous administration of fluids permits rapid restoration of blood volume. The visible capillaries of the nail beds are increased in number and size. The erythrocyte count generally is not changed. There is an initial decrease in the number of leukocytes, with a subsequent increase. There is a leukocytosis which starts during the fever period and rises in tidelike fashion with the addition of waves of neutrophilic cells and then gradually recedes to prefebrile levels in from twenty to twenty-four hours. This leukocytosis is varied, the total cell count ranging from 10,000 to 60,000.

Prolonging the fever, especially at high temperatures, delays leukocytosis or at least produces a smaller increase in leukocytes than does a shorter or less intense session of fever. It has been shown that continuous high fever in the rabbit prevents leukocytosis and may eventually lead to leukopenia. This action is explained by a progressive fall in the lobe index (number of nuclear lobes per hundred polymorphonuclear leukocytes), indicating that the bone marrow is pouring cells into the blood but is unable to keep pace with the emigration of these cells to the tissues.

Sessions of fever produce nuclear changes in the polymorphonuclear leukocytes, and these changes are in part toxic and in part the result of accelerated metabolic activity. There is a tendency to hypersegmentation and to the production of macropolycytes.

Bone marrow which has been previously stimulated but which is not being actively depleted by demands made by the tissues will respond to artificially induced fever by marked leukocytosis. Conversely, bone marrow which is being stimulated actively but which is also being drained by demands of the tissues will respond with only slight leukocytosis. This is illustrated by the slight response to the malarial paroxysm which

occurs late in this disease. The same bone marrow, after a period of recuperation following quinine treatment, will respond by marked leukocytosis when subjected to artificial fever.

Histologic studies of organs of animals subjected to fever sessions continuously until death disclose focal accumulations of polymorphonuclear leukocytes which often reach the proportions of abscesses. In the lymph nodes there is early and progressive destruction of the lymphocytes followed by polymorphonuclear infiltration and later by a marked proliferation of actively phagocytic clasmatocytes. At this later stage, the nodes thus involved are hypoplastic without evidence of lymphocytic regeneration.

There is slight, if any, change in the nitrogenous constituents (urea, uric acid and creatinine) of the blood. There is a consistent increase in the clearance of the creatinine content, in contrast to wide variations of the clearance capacity which occur during infection. There is little or no change in the non-nitrogenous constituents, such as sugar, phosphorus, lipids and calcium, except, occasionally, for a slight increase, which in turn depends on an increase in concentration of the blood. There occurs no significant decrease in the lipids of the plasma such as is seen in the presence of acute infections. There is usually an alteration in the acid-base equilibrium of the blood which tends to produce slight alkalosis. Marked alkalosis may be noted. It has been concluded that fever characterized by severe dehydration and hyperventilation induces pronounced alkalosis. The degree of alkalosis which approaches critical levels is dependent on the severity of the dehydration and on the extent of hyperventilation. Opinions vary as to the effect on the hemal concentration of the chlorides. Some investigators claim that there may be a marked decrease in this concentration, whereas others declare that there is no significant change. If salt or a weak saline solution is administered by mouth during treatment, the hemal concentration of chlorides diminishes very little. If no sodium chloride is administered, profuse sweating and a diminished concentration of chlorides are to be expected. It has been noted that in seven cases the development of jaundice followed prolonged fever therapy. Two significant effects common to each case were found: (1) the increase in the icteric index was accompanied by a low value for the serum chloride and a diminished excretion of urinary chlorides and (2) the jaundice could be relieved only by the administration of large amounts of sodium chloride, and not by the administration of carbohydrates. Proper attention to the chloride and water balances "is apparently the most important factor in the technic of administering prolonged fevers." The oxygen content and oxygen-combining power of venous blood are increased. Opinions also vary as to the effect of artificial fever on the agglutinins of the blood, but the agglutination titer is generally within normal limits. The action of complement-fixing antibodies is temporarily diminished, but there is no change in the opsonic index. In studies on the effects of fever, great modifications in the antibodies of normal and syphilitic patients following fever were found. Studies made by means of a calorimeter on the mechanism of heat loss from the human body showed that "the mechanism for heat loss is adequate to care for twelve times the basal heat production" and that "spontaneous fever is due almost entirely to malfunction of the mechanism for heat loss."

Other Effects.—Examination of the effects of fever therapy on the gastric contents reveals a sudden decrease in the amount of chlorides and an increase in the amount of lactic acid. The urine is increased in amount, but temporary oliguria generally occurs. The reaction of the urine is unchanged, but the urine may be slightly alkaline and its specific gravity may be increased. The basal metabolic rate is increased approximately 7 per cent for each degree of fever induced. Cold fluids taken by mouth produce fluctuation in the gastric temperature but do not appreciably affect the general temperature. The comparison of the temperatures observed in the median antebrachial vein, rectum, uterine cervix, Hunter's canal, bladder and spinal canal indicate that records of the rectal temperature provide an accurate index to the temperature of the deep tissues. After each treatment there may be a temporary loss of weight as a result of loss of fluids unless sufficient fluids are taken by mouth, but this lost weight is quickly regained and after a course of fever therapy a patient usually retains his original weight or even gains weight.

PATHOLOGIC CHANGES

Hemorrhagic encephalitis and hemorrhagic pneumonitis have been noted in some instances in which extreme hyperpyrexia was induced. Deterioration of, and hemorrhage into, the cortex of the suprarenal gland may occur after induction of such hyperpyrexia. In the large viscera of laboratory subjects killed by hyperpyrexia there were found regions of focal degeneration and cloudy swelling. It has been observed that no demonstrable changes in nerve tissues occur in laboratory animals whose temperatures were elevated to 111.5 to 111.9 F. for from thirty-three to seventy-five minutes. Rabbits which were subjected until death to febrile temperatures not exceeding 108.3 F. were seen to have peripheral nerves characterized by degenerative changes of the reversible type. Intensity of the changes was directly proportional to the degree of febrile temperature induced in each animal. In rabbits subjected to intermittent periods of induced fever (during which the average bodily temperature varied between 106.1 and 107.8 F. for a total of from eighteen to fifty hours with one week of recovery time allowed between the last exposure and the time of killing) the peripheral nerves exhibited only mild intensities in the reversible types of degenerative change. If the bodily temperature of the animals was raised to 107.6 to 108.5 F. for eight hours and thirty days intervened between the time of exposure and the time of killing, the nerves showed a marked return to the normal status. Inferential evidence presented with this study indicated that regional anoxia was a contributing factor of considerable importance in the causation of the degenerative changes in the peripheral nerves observed after artificial fever.

At necropsy after death resulting from the induction of artificial fever, as observed in the experimental laboratory and elsewhere, pathologic lesions have been found which are similar to the lesions discovered at necropsy after death caused by the administration of nitrous oxide anesthetic. These lesions would seem to indicate that death may result from anoxia.

BACTERICIDAL EFFECTS

Neisseria gonorrhoeae is generally destroyed by a temperature of from 106 to 107 F. (41.1 to 41.6 C.) in from six to twenty-seven hours. In a high percentage of cases of syphilis, dark field illumination w

not reveal the presence of *Spirochaeta pallida* after the patient has been treated with fever induced by physical means. *Mycobacterium tuberculosis*, *Streptococcus haemolyticus* or *Streptococcus mitior* when exposed to temperatures within physiologic ranges in vitro show no cultural changes. *Micrococcus catarrhalis*, *Haemophilus conjunctivitis*, *Haemophilus influenzae*, *Brucella abortus*, *Escherichia coli*, *Eberthella typhosa*, *Streptococcus haemolyticus*, *Streptococcus viridans* and *Diplococcus pneumoniae* (type I and type III) usually resist a temperature of 107 F. (41.6 C.) in vitro for twenty-four hours; an occasional strain shows some reduction in number.

DESCRIPTION OF APPARATUS

There are various devices for the production of artificial fever. The most common devices used at present are the air conditioned cabinets, luminous heat cabinets, air conditioned cabinets used in conjunction with short wave diathermy, electric blankets and zipper bags or blankets used in conjunction with short wave diathermy.

Air conditioned cabinets produce a rise in the bodily temperature by circulating hot, humid air over the body. Hyperpyrexia is produced by the heated air. The dry air temperature of these cabinets is usually maintained at between 110 and 130 F., and the humidity is maintained at as high a percentage as possible (from 80 to 95). These cabinets are heated by small radiant heaters similar to the units found in the household electric heater. The humidity may be maintained by a 1,000 to 2,000 watt immersion heater placed in a pan of water. The air is circulated by means of small fans. This type of cabinet can be used with entire satisfaction to produce artificial fever without the aid of a diathermy apparatus. Several such cabinets are on the market.

There is a luminous heat cabinet which is similar in its action to the air conditioned type except that it is heated by four or five 200 watt carbon filament bulbs situated in the top of the cabinet. It has a fan and humidifying pan with which to circulate and humidify the air. This type of cabinet can be constructed easily by any hospital carpenter for from \$150 to \$250.

Short wave diathermy machines have become very efficient in the production of artificial fever. The most satisfactory means of using short wave diathermy is to employ it in conjunction with an air conditioned cabinet. Fever is induced by means of the short wave electromagnetic cable or electrostatic plates; the bodily temperature is maintained by means of the air conditioned cabinet.

High frequency currents, short wave diathermy and, likewise, conventional diathermy can be used in conjunction with blanket packs or bags with slide fasteners. This procedure is satisfactory for administering short sessions of fever but is not satisfactory for the production of prolonged high fever. The blanket pack or the bag with slide fastener exerts an extremely confining effect on the patient, so that it is almost impossible for him to withstand many hours of fever. Various kinds of electric blankets, some of which are designed in the form of a large sleeping bag, have been constructed for use in fever therapy. They are less expensive than cabinets, but their great disadvantage is that the patients enveloped within them are closely confined. These blankets, if employed at all, should not be used when a temperature of more than 103 or 104 F. (39.4 or 40 C.) is required. None have yet

been approved by the Council on Physical Therapy of the American Medical Association.

Hydrotherapeutic Methods.—The production of fever by means of hot baths is still being used successfully by some investigators. Although prolonged hot tub baths are enervating, they elevate the patient's temperature rather rapidly and may maintain it at a fairly high level for from one to two hours. After the fever has been induced by means of the bath it can be maintained by means of blankets or, better still, by means of a simple radiant heat cabinet.

The simple tub bath is as inexpensive and uncomplicated as any method of producing fever. It seems likely that as physicians continue their search for simpler and better methods of producing artificial fever by physical means, they will more frequently elevate the temperature by means of hot baths and maintain it with a radiant heat cabinet.

In administering the hot spray bath, the nude patient is placed in a cabinet in the supine position with his head protruding from one end, as if he were lying in an air conditioned or other type of heat cabinet. He is then sprayed with a series of very fine jets of nebulized hot water, the temperature of which is controlled by means of a thermostat. This spray cabinet will produce a rapid rise in bodily temperature if the temperature of the water can be maintained at the proper degree. One supposed advantage of this method is the fact that the thermostat can be switched immediately, thus releasing a momentary spray of cold water. The brief spray of cold water will exert a refreshing effect on the patient; at the same time, if the switch to the cold water is maintained for a brief time only, there will be an increase in the bodily temperature instead of a decrease. Apparently the momentary contraction of the peripheral capillaries caused by the cold spray drives the warm peripheral blood into the splanchnic regions, thus producing an additional and a more rapid increase in the systemic temperature. The chief detriment to the use of the spray cabinet is that the operator must depend on a general water supply as the source of heat, and it is rarely possible to obtain a constant flow of sufficiently hot water.

Other Conduction Methods.—A simple method of inducing hyperpyrexia by wrapping the patient in blankets and rubber sheeting has been used. With this method, no source of heat other than the natural heat of the body is utilized; however, four or five hours is necessary in which to elevate the bodily temperature to 104 F. (40 C.), which would seem to be an unnecessarily long period of discomfort before the required high temperature is achieved. If this method is to be used, it would seem expedient to use at least a few hot water bottles in the patient's wrapping in an attempt to induce the fever more rapidly.

In using the hot water bottle and blanket method, the patient is simply wrapped in a number of thick blankets and surrounded by a number of hot water bottles. The great disadvantage of any blanket method of inducing hyperpyrexia rests in the fact, as has been indicated, that nearly all patients are rendered extremely uncomfortable by the confinement of their limbs occasioned by the necessarily tight wrapping of so many heavy coverings.

PERSONNEL

A carefully trained team consisting of technicians and a physician is essential to the safe conduct of fever therapy. The personnel of the fever therapy depart-

ment is almost as important as the personnel of the operating room. A competent physician familiar with all the reactions which can be evoked by this type of therapy should be in attendance at all times during the treatment. The treatments should be administered by registered nurse-technicians who have been trained for at least one month or six weeks in a well organized fever therapy department of a hospital or under the close supervision of some person who has had such training. It has been said "The percentage of cooperative patients is directly related to the expertness and the tact of the nurse in charge." Failure to achieve a measure of success with fever therapy in many institutions arises from the fact that the attending nurses have not been adequately trained and familiar with the physiological principles that are essential to effective treatment. For many reasons the use of fever therapy should be confined to institutions. It must be borne in mind at all times that fever therapy is not without danger. Though it is entrusted to a corps of highly trained workers, serious complications can and do occur during its administration.

TECHNIC

Selection of Patients.—Emphasis cannot be laid too strongly on the need for careful selection of patients. The patient should be subjected to a careful physical examination before treatment, and if there is any degree of hypertension, cardiac disease or severe debility he should be rejected. Functional disorders of the heart need not contraindicate fever therapy, and under satisfactory control patients with diabetes may also be accepted. Pulmonary tuberculosis may not be a contraindication per se, but the associated respiratory involvement may prevent the satisfactory elevation to, and maintenance of, high temperature. Fever therapy is not contraindicated by the presence of subacute carditis or inactive rheumatic heart disease; on the contrary, it may be of benefit in such conditions. In general, it might be said that any contraindication to major surgical procedures is likewise a contraindication to this type of therapy.

Management of Patients During Treatment.—Fever therapy is not tolerated uniformly by all patients; as is the case with other types of therapy, toleration depends on the reactions of the individual patient. The average person should be told what to expect of the treatment, should be enlightened as to the various physical changes that will occur and should be informed that the treatment is severe but not intolerable. Persons who have no idea of what to expect during the fever treatment frequently become extremely nervous, so that they cannot be controlled for the desired length of time. There is a certain group of extremely nervous, easily excitable persons who will not tolerate the treatments.

The most common untoward results observed during fever therapy are headache, restlessness, nausea, vomiting, tetany and muscle cramps. Heat prostration may occur. Restlessness requires sedation, which may be repeated every two or three hours. There is considerable variance of opinion concerning the best sedative, but in the experience of most workers codeine, pantopon, dilaudid and morphine sulfate have been satisfactory. It has been contended that carbamide sedatives are more satisfactory for basic sedation than the barbituric acid group of drugs. The latter are respiratory depressants and may also increase the danger of hemorrhage and patchy necrosis of the central nervous

system. Such hemorrhage and necrosis may be produced by anoxia which often exists during fever therapy or simply by the barbiturates when administered in toxic doses. Therefore, the combination of barbiturates and fever seems ill advised. It seems essential to keep the patient quiet but never in a state of narcosis sufficient to prevent his reacting to questioning. Nausea and vomiting may be controlled by intravenous injections of from 500 to 1,000 cc. of 5 per cent dextrose and 1 per cent sodium chloride in solution during the treatment. Tetany may be corrected readily by the intravenous injection of 10 cc. (approximately 2½ fluidrachms) of calcium gluconate. From a study of the metabolism of chloride and water it has been concluded that the maintenance at a high level of the patient's intake of fluid and sodium chloride is of the utmost importance. For the average six to ten hour period of fever treatment, a total intake of from 3,000 to 5,000 cc. (3 to 5 quarts) of fluid has been found effective. An intake of sodium chloride of at least 20 Gm. (approximately 5 drachms) will cover the chloride loss in perspiration for the average treatment. The maintenance of fluid and chlorides may be accomplished easily by having the patient drink from 3 to 6 liters of a solution of 0.3 or 0.6 per cent sodium chloride, iced, during the session of fever. The patient may also be allowed to drink sweetened tea, orange juice, lemonade and carbonated beverages. He should be instructed to ingest a meal rich in carbohydrates on the night before a fever treatment. In some cases an intravenous injection of from 500 to 1,000 cc. of a solution of 5 per cent dextrose in physiologic solution of sodium chloride should be made on the morning of treatment.

The skin of the patient should be observed frequently during treatment. The feet and legs may be protected by a covering of terry cloth placed in position at the beginning of the treatment. If a region of erythema appears on any part of the body, that region should be protected by a towel. If the erythema becomes more prominent, a cold cloth or a piece of ice may be applied. By observing such precautions and by elevating the patient's temperature gradually, one can prevent what might otherwise develop into severe burns.

When air conditioned cabinets are used, the dry air temperature should be maintained between 110 and 130 F. (43.3 and 54.4 C.) in association with high humidity and low air velocity. With this procedure, there is little necessity for covering the patient and burns of the skin are infrequent.

Episodes of delirium occur not infrequently during prolonged high fever. Delirium, unless it is violent, does not contraindicate continuance of the treatment.

There is usually an increased oxygen saturation of the venous blood during the early part of a fever session but later if there is circulatory failure there may be a severe anoxemia and anoxia. The factors producing this anoxia are increased temperature of the blood and the resulting increased demand for oxygen in the tissues and, in some instances, failure of circulation. Oxygen inhalation is an important factor during fever treatments. At one time oxygen tents were used over the heads of patients in fever cabinets in an attempt to increase the effectiveness of therapy, the assumption being that the high oxygen saturation of the blood thus obtained might be an important factor in the curative effect of the fever. With bodily temperatures of from 101.8 to 105.9 F. (38.8 to 41.1 C.), the oxygen content of the venous blood was observed to be considerably

elevated. When the bodily temperature was elevated and oxygen was also administered, the percentage oxygenation of the hemoglobin frequently was found to exceed 95; however, a clinical estimate of the procedure indicated that the combination of oxygen and fever was only slightly more effective against disease than was fever alone. It was decided, however, to consider the use of oxygen in conjunction with fever therapy only from the standpoint of additional safety to the patient. The oxygen tent was found cumbersome and difficult to use, because most patients objected seriously to being entirely enclosed. The use of nasal catheters has been suggested, as has also use of the so-called face tent.

More recently, use of one of the two types of the new Boothby-Lovelace-Bulbulian oxygen face masks has been found effective. The mask is laid lightly over the patient's nose and he is permitted to inhale oxygen at intervals during one half to three fourths of the entire treatment. The adjustment is so arranged as to permit a partial rebreathing and a partial admixture of atmospheric air. *Patients do not object to this type of mask*, because it is light, readily applied and easily lifted off at any moment to allow sponging of the face and administering of fluids by mouth. The intermittent administration of oxygen during all fever treatments is an important additional safety factor in the prevention of the dangerous after-effects of anoxia that have been so clearly described by a number of investigators.

There should be a well trained fever therapy nurse in constant attendance on the patient. At no time should she be more than a few feet away. The pulse rate, temperature and respiratory rate should be recorded every fifteen minutes for the first hour of therapy and every ten minutes thereafter. A careful record should be made of the amounts of fluid intake and also of the reactions of the patient. The temperature should be taken during the first hour by both mouth and rectum and thereafter by rectum exclusively. Electrical indicating thermometers are extremely convenient and satisfactory and their use allows the nurse-technician to give more attention to the patient. The blood pressure should be recorded every hour during the treatment. Any untoward reactions of the patient seen by the technician should be reported immediately to the physician in charge, who should be within calling distance at all times.

COMPLICATIONS

Mention already has been made of the reactions that may occur during a session of fever, such as headaches, nausea, vomiting, tetany and abdominal cramps. Nausea and vomiting also may be present during the evening after treatment, although they are usually relieved within twenty-four hours. Herpetic lesions on the lips and in the mouth, nose and pharynx may be so severe as to render eating and drinking difficult for a time. These lesions tend to disappear even though fever treatments are continued at regular intervals.

Occasionally superficial burns occur, especially on the arms and chest. However, these usually do not interfere with subsequent sessions of fever, and they can be avoided in practically all cases if the precautions previously mentioned are followed.

One of the most serious complications is circulatory collapse with a possibly fatal termination. Circulatory disturbance may occur during treatment in spite of the more careful antitherapeutic examination and even though the condition of the patient is apparently good during the treatment. In cases of circulatory collapse,

the usually accepted treatment for shock is administered. Not only a rise of the temperature above safe physical limits but other serious consequences may be avoided by discontinuing treatment whenever any of the following conditions are found: (1) a systolic blood pressure of less than 80 mm. of mercury, (2) a pulse pressure of less than 20 mm. of mercury and (3) a pulse rate of 160 beats or more which is constant for more than thirty minutes. Often in the presence of these conditions cooling the patient momentarily may result in an improvement that will last throughout the treatment. It is now known that circulatory collapse occurring during fever therapy may be caused by the loss of fluids resulting from excessive perspiration. If the systolic blood pressure recedes below 80 mm. of mercury during the treatment, intravenous injection of from 500 to 1,000 cc. of physiologic solution of sodium chloride containing 5 per cent dextrose should be started at once. This is a most important safety measure; it will often permit continuation of treatment by replacing the lost fluids and by raising the blood pressure to within safe limits.

Another complication of a serious nature, infrequently encountered, is heat stroke. The patient's temperature rises suddenly to 107 F. (41.6 C.) or above. The pulse becomes hard, but its rate is not increased in proportion to the elevation of temperature. The blood pressure increases and coma and pulmonary edema may suddenly develop. The patient should be removed from the cabinet immediately and cooled by means of a tepid sponge bath and by a fan which blows cool air directly on the body. This procedure is considered preferable to the use of ice baths, which may contract the peripheral capillaries and lessen heat radiation. If pulmonary edema and apparent cerebral edema occur, the patient should receive a solution of hypertonic dextrose (50 per cent) by intravenous injection or a venesection should be done. The temperature may rise rapidly to 110 F. or more, with fatal results, or return to normal. If it returns to normal, care should be taken that the patient's condition does not proceed to a state of shock accompanied by a subnormal temperature.

THERAPEUTIC INDICATIONS

As is the case with many new therapeutic agents, artificial fever has been recommended for the treatment of a large number of diseases. As mentioned previously, it has been used for no less than fifty different ones. Space does not permit detailed consideration of the use of artificial fever produced by physical means in the treatment of all the conditions for which it has been recommended or used, which are as follows: adiposis dolorosa, allergic dermatitis, bronchial asthma, bronchiectasis, Buerger's disease, cerebral atrophy complicated by chronic otitis media, chorea, chronic sinusitis, dermatitis herpetiformis, epidemic encephalitis, epilepsy, infections of the gallbladder, gonorrheal arthritis, gonorrheal corneal ulcer, gonorrheal endocervicitis, gonorrheal epididymitis, gonorrheal prostatitis, gonorrheal salpingitis, gonorrheal urethritis, pelvic inflammatory disease, Hodgkin's disease, infectious arthritis, interstitial keratitis, subacute iritis, meningococcic septicemia, multiple sclerosis, mycosis fungoides, optic atrophy, osteogenic sarcoma, osteomyelitis, Parkinson's syndrome, peripheral vascular disease, psoriasis, psychoses, radiculitis, Raynaud's disease, rheumatic fever, sciatic neuritis, scleroderma, syphilis, syphilitic meningitis, ocular syphilis, syphilis of the nervous system, trichinosis, tumor and undulant fever.

It must be emphasized most strongly that fever therapy is probably of little or no value in the treatment of a number of these diseases. It would be distinctly dangerous to use fever therapy in some of the diseases for which it has been recommended. Among these may be mentioned: arteriosclerosis, subacute bacterial endocarditis, hepatic infections, pyelitis, staphylococcal septicemia and tuberculosis. Recent studies have added greatly to information on the treatment of some diseases by artificial fever; such studies should be consulted before artificial fever induced by physical means is employed to treat the disease in question.

Subacute Bacterial Endocarditis (Endocarditis Lenta).—It has been demonstrated definitely that, although there are some slight temporary relief of pain and a lowering of temperature following artificial fever therapy, no permanent beneficial effects can be noted after the hyperpyrexia treatment of patients having subacute bacterial endocarditis. Because of the presence of small vegetations of bacteria and fibrin on the endocardium, the marked increase in the velocity of the blood produced by fever therapy apparently increases the danger of embolism. Either cerebral or other embolism may occur. In addition it has been demonstrated that *Streptococcus viridans* is able to resist the highest temperature that the human body can tolerate. It is believed that any further attempts to use fever therapy for subacute bacterial endocarditis should be abandoned.

Bronchial Asthma.—Despite the fact that in a fairly large number of cases of intractable bronchial asthma fever therapy has brought about favorable results, it is felt that it should not be attempted in such cases unless all other means have failed. The results are frequently only temporary, and in some instances no improvement can be obtained. In no instance should fever therapy be attempted as an office procedure. It is the opinion of one investigator that hyperpyrexia of itself will be of only temporary, if indeed any, value but that when it is used in conjunction with other forms of treatment it is a most valuable adjunct.

Chorea.—The total number of cases of chorea treated by artificial fever induced by physical means is still too small to permit formation of any final conclusions. The studies do indicate, however, that the treatment of chorea by this method should be continued in well equipped institutions. Several investigators have found that choreiform movements cease in as many as 80 per cent of cases. Other investigators have reported more than 400 attacks of chorea for the alleviation of which the patients received fever therapy. Sixteen patients who had suffered from associated rheumatic carditis were also benefited. Comparative analyses of ninety-five cases in which the patients received fever therapy and of seventy-five in which they did not disclose a definitely lowered incidence of rheumatic manifestations among those patients who received fever therapy. Fever therapy was effective in cutting short an attack of chorea. The presence of associated active carditis was not a contraindication to its use; in fact, the carditis was perhaps benefited by it. The immediate results were excellent and recovery occurred in the majority of cases. The procedure of treatment for chorea has varied with different investigators, but in general it is believed that ten or twelve sessions of from two to three hours daily, with bodily temperatures maintained at from 104 to 105 F. (40 to 40.5 C.), form

the procedure of choice. Some workers, however, have employed from four to six sessions, each of which was from five to eight hours in duration, maintaining the bodily temperatures between 104 and 105 F. (40 and 40.5 C.) and repeating these sessions every third or fourth day. Typhoid vaccine has been used with satisfactory results, the temperature being raised to 104 or 105 F. (40 or 40.5 C.) and maintained at a constant elevation for from five to six hours by means of a blanket pack. It is felt, however, that the fever therapy produced by physical means is more easily controlled and that children will accept and tolerate it more readily.

Gonorrhea.—The effects of artificial fever therapy produced by physical means on gonorrhea and its complications are conclusive. Reports by several investigators are available concerning the pyrexia treatment of gonorrhea in a large series of cases. More than 1,000 cases of gonorrhea treated by artificial fever induced by physical means have been recorded during the past five years. The percentage of remissions in the series of cases previously mentioned has been approximately 90. The rationale of the application of fever therapy to gonorrhea has been based of course on the thermolabile properties of the gonococcus.

When fever therapy was first used for gonorrhea, the patient's bodily temperatures were raised to from 106 to 107 F. (41.1 to 41.6 C.) and maintained at this level for six hours. The patient usually received from three to ten treatments, administered every third day. Later it was found that when gonorrheal infections were treated for periods equal to or slightly less than the thermal death time of the gonococcus, there was usually destruction of that organism. Many workers began to use fever sessions of long duration, the usual session being ten hours, maintaining the bodily temperatures at from 106 to 107 F. (41.1 to 41.6 C.). The duration of the treatment administered at 106.7 F. (41.5 C.) may be sufficient to equal 85 per cent of the thermal death time of the gonococcus and yet fail to result in a cure; on the other hand, treatment brief enough to equal only 10 per cent of the thermal death time occasionally results in a cure. The variation in effectiveness is probably influenced by the condition of the defense mechanism of the body. In the use of single fever sessions of ten hours' duration with bodily temperatures maintained at from 106 to 107 F. (41.1 to 41.6 C.), the results have been most satisfactory. In 94.6 per cent of ninety-nine cases there was remission after an average of 1.1 sessions, each ten hours in duration.

Since the introduction of sulfanilamide into therapy, the need for artificial fever in treating gonorrhea has become less; however, there remains a certain percentage of patients who cannot tolerate sulfanilamide or with whom sulfanilamide does not eradicate the disease. For these the combination of sulfanilamide and hyperpyrexia has proved most efficacious.

Gonorrheal Arthritis.—In most cases startlingly good results have been obtained with artificial fever in the treatment of gonorrheal arthritis. Most reports show that approximately 60 to 80 per cent of the patients become symptom free and that an additional 10 per cent are markedly improved; the other 10 per cent remain unimproved. The results are better when the treatment is instituted early in the course of the disease than when it is delayed until the disease has reached a chronic stage. The procedure used in the treatment of gonorrheal arthritis is the same as that for gonorrhea in general.

Other Gonorrheal Complications.—Gonorrheal ophthalmia has been shown to respond readily to fever induced by physical means, results revealing themselves in the form of subsidence of the inflammation, disappearance of the organism from the conjunctival tissues, acceleration of healing and a shortened stay in the hospital. Gonorrheal endocervicitis, gonorrheal prostatitis, gonorrheal salpingitis, gonorrheal pelvic inflammatory disease and gonorrheal endocarditis have been shown to respond favorably to prolonged high artificial fever. In the treatment of gonorrheal infections in the female, it has been found advantageous by some investigators to use local pelvic heating in conjunction with fever therapy. This may be done either by using vaginal applicators with which to heat the pelvis by a high frequency current or by using Elliott vaginal applicators with hot water as the thermal agent.

Infectious Arthritis.—About 30 per cent of one group of patients with infectious arthritis who were treated with artificial fever were significantly improved. The other 70 per cent exhibited little or no improvement. Fever sessions of short duration, during the course of which the bodily temperatures are elevated to from 101 to 103 F. (38.3 to 39.4 C.) by means of fever cabinets and hot baths, have been used; in conjunction with other corrective physical therapy they have appeared to be of benefit.

Meningococcic Septicemia.—Recoveries from this disease following the use of intense fever (of seven to ten hours in duration), with the temperature at 106.8 F. (41.5 C.), have been reported. Certain strains of meningococci were seen to exhibit a reduction in growth when they were maintained in culture at temperatures ranging from 40 to 42 C. (104 to 107.6 F.). Five strains were destroyed or greatly reduced in number within five hours or less. Fever therapy seems worthy of trial in selected cases of meningococcic infection.

Multiple Sclerosis.—The results of fever therapy in the treatment of multiple sclerosis for the most part have been unfavorable, although the number of cases reported is still too small to permit the formation of final conclusions.

Mycosis Fungoides.—After the induction of artificial fever by physical means, eight of ten patients having this disease were seen to obtain moderate improvement, an improvement, however, which apparently was only temporary.

Neuritis.—Low fever has been recommended as a safe and efficient means of treating neuritic and radicular pains.

Parkinson's Syndrome.—The use of artificial fever therapy for the condition causing this syndrome has not been particularly satisfactory. In seeking relief from this syndrome, it would probably be best to heed the statement "Fever therapy in the form of diathermy or malarial or bacterial injections seems to produce no permanent benefit. It may even do harm."

Rheumatic Fever.—It would seem that the treatment of rheumatic fever by artificial fever may sometimes be justified. After the use of artificial fever therapy in a small series of cases, patients often reported considerable relief of pain and swelling of the joints; there was a reduction in the leukocyte count and a decrease in the sedimentation rate of the erythrocytes.

In a comparative study of a small series of patients, some treated by means of artificial fever and some

untreated, there was a striking reduction in the percentage of polyarthritis and also in the deaths from heart disease in the fever-treated group. Further analysis of the patients who had heart disease showed that the severity of the cardiac lesion was considerably greater in the untreated group; however, the two groups were small and the observation periods were not sufficiently long to warrant any final conclusion. The procedure used in the treatment of such patients usually consists of sessions of fever therapy four or five hours in duration with bodily temperatures maintained at from 104 to 105 F. (40 to 40.5 C.).

Syphilis (Early Primary).—Preliminary clinical investigations seem to indicate that, when artificial fever therapy is combined with chemotherapy, better results can be obtained than by the use of either form of therapy alone. However, in its present stage of development, fever therapy could not possibly be made available to the average patient having a primary syphilitic lesion. When the bodily temperature has been elevated to more than 105 F. (40.5 C.) for fifty hours in ten sessions of five hours each, this procedure being combined with thirty injections of an antisiphilitic chemical agent, cutaneous manifestations of the disease, including chancres, have been reported to respond with surprising promptness, so that no living, motile spirochetes can be found in any of the primary lesions after the first fever treatment. Progressive improvement in serologic reactions has appeared in the majority of cases. The results of treatment in control groups for which either fever therapy or chemotherapy was used indicated that neither of these methods alone was as effective as the combined procedure.

Dementia Paralytica.—The use of artificial fever produced by physical means in the treatment of dementia paralytica is becoming more and more extensive; however, there is still insufficient evidence available for the investigator to conclude that such fever will be more or less satisfactory than malarial fever. Most observers who have made careful comparative studies feel that fever produced by physical means offers a slightly higher percentage of immediate clinical remissions than does therapeutic malarial fever; however, it has been claimed by certain authorities in the field of syphilology that the relapse rate for physically induced fever will be higher than that for malarial fever. Certainly it will be several years before any final conclusions can be drawn; nevertheless, the best available comparative studies indicate that 70 per cent of patients with dementia paralytica who were treated with physically induced fever were immediately benefited by the treatment and that two years and eight months later 66.6 per cent of them remained improved; whereas, of a control group treated by malarial therapy, 63.3 per cent were improved immediately and two years and eight months later 56.6 per cent remained improved. These observations seem to indicate that the response of dementia paralytica to physically induced fever is apparently as well sustained as improvement brought about by therapeutic malaria. Much larger series of cases will have to be studied before final conclusions can be drawn.

Tabes Dorsalis.—It is generally agreed that patients with tabes dorsalis may be benefited by physically induced fever. Some investigators feel that tabetic pains and gastric crises respond more rapidly and with greater certainty to physically induced fever than to therapeutic malarial fever. Again it must be stressed

that the number of cases collected is not large enough to permit formation of any final conclusions. As additional evidence is collected, however, it becomes more apparent that physically induced fever may be of great value in the treatment of syphilis, particularly the tertiary manifestations of the disease.

Other Forms of Syphilis.—A number of investigators have reported encouraging results following the use of physically induced fever in the treatment of ocular syphilis, and there have been favorable reports also on the use of fever therapy for tabetic dementia paralytica, meningovascular syphilis and asymptomatic neurosyphilis.

Tuberculosis.—The study of the effect of fever therapy on dogs which had been subjected to experimental tuberculosis disclosed a temporary improvement, and as compared with that of control dogs, life was prolonged. Investigations, however, indicate that in the presence of tuberculosis, artificial fever therapy should be employed only with great care even in experimental studies. There is grave danger of doing harm to the patient if fever therapy is used for this disease. The study of this phase of the treatment of tuberculosis should for the present remain entirely in the hands of research workers.

Undulant Fever.—Several investigators have noted that in a small series of cases of undulant fever there has been a rather striking response to fever therapy. About 80 per cent of the patients treated exhibited definite clinical remissions with prompt disappearance of symptoms; however, the number of patients so treated is still insufficient to permit formation of final conclusions concerning the effectiveness of fever therapy. The procedure has been to administer five hour sessions of fever with bodily temperatures maintained at between 105 and 106 F. (40.5 and 41.1 C.); usually from one to three such treatments are necessary.

Conclusions with Respect to Diseases Treated.—Studies made to date seem to indicate that the chief sphere of usefulness of fever induced by physical means lies in the treatment of gonorrhea, both acute and chronic, and its complications. It would appear that artificial fever may be of value in the treatment of syphilis, particularly when it is combined with chemotherapy. While there is a suggestion that artificial fever produced by physical means may be helpful in the treatment of intractable bronchial asthma and in selected cases of chronic infectious arthritis, chorea and undulant fever, the clinical data are not sufficient to permit formation of any final conclusions. Its value in about forty other diseases remains to be proved. It seems to offer promise of considerable usefulness as a therapeutic agent.

CONCLUSIONS

Continued study has emphasized the fact stressed by the Council on Physical Therapy, namely that production of fever by physical means is strictly a hospital procedure, that it is essential that a well trained personnel be in complete charge of the work, that skilled nurse-technicians who have had at least one month's supervised training administer the treatments and that a physician be in constant attendance.

Patients to be treated by fever should be selected with as much care as those who are to undergo major surgical operations. The dangers that have been mentioned, embolism, hemorrhage and sudden death, are extremely rare when the administration of fever is in the hands of a competent, well organized group. How-

ever, it is to be expected that there will be a slight mortality resulting from a treatment that is as heretofore as this one. If the treatments are given without proper control or are considered simple office procedures, there will be danger of harm to the patient or even death.

Opinions vary as to the best and safest means of producing fever. Almost any one of the methods described in this article may be used with the confidence that will produce favorable results, provided the team workers has developed a good technic for the particular method to be employed.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED

FRANKLIN C. BING, Secretary

CLAPP'S CHOPPED FOODS—SPINACH, GREEN BEANS, CARROTS, BEETS

Manufacturer.—Harold H. Clapp, Inc., Rochester, N. Y.

Description.—Canned chopped spinach, green beans, carrots and beets, respectively, slightly seasoned with salt. The vegetables are cut into small particles of relatively uniform size.

Manufacture.—These products are treated essentially according to the methods used in the preparation, canning and the processing of canned strained vegetables. Each vegetable in the Clapp's Chopped Food line, however, is not strained but passed through a chopping machine which consists of a set of circular knives rotating between grates. The size of the food particles produced is determined by the opening in the grates.

Analyses (submitted by manufacturer).—

	Spinach, %	Green Beans, %	Carrots, %	Beets, %
Moisture	93.9	91.1	92.8	91.5
Total solids	6.1	8.9	7.2	8.5
Ash	1.8	0.9	0.6	0.5
Sodium chloride (NaCl)	0.4	0.5	0.5	0.2
Fat (ether extract) ..	0.4	0.3	0.2	1.0
Protein (N × 6.25) ..	1.4	1.6	0.7	0.5
Crude fiber	0.5	1.1	0.5	0.5
Carbohydrates other than crude fiber (by difference)	2.0	5.0	4.2	5.7

Calories.—Spinach 0.17 per gram, 5 per ounce. Green beans 0.3 per gram, 8 per ounce. Carrots 0.2 per gram, 6 per ounce. Beets 0.3 per gram, 8 per ounce.

Vitamins.—No evidence has been provided the Council as to the vitamin content of these products. The method of preparation and processing is designed to retain the natural vitamin values to the highest degree consistent with adequate and safe heating processes. Contact of the product with air during processing is avoided as far as possible.

Claims of Manufacturer.—These products are intended primarily for use in feeding infants who no longer require the vegetables to be strained or puréed.

CELLU BRAND BLACKBERRY JUICE

Distributor.—Chicago Dietetic Supply House, Inc., Chicago

Description.—Canned blackberry juice packed without added sugar.

Manufacture.—Fully ripened blackberries on which no wax material has been used are carefully selected, washed, sorted, preheated and pressed through ordinary press cloth. The resulting juice is run into cans and the cans are sealed and then processed.

Analysis (submitted by distributor).—Moisture 85.4%, total solids 14.6%, ash 0.4%, fat (ether extract) 0.6%, protein (N × 6.25) 0.1%, crude fiber 0.02%, carbohydrates other than crude fiber (by difference) 13.5%, invert sugar 12.7%, sucrose 0.1%.

Calories.—0.6 per gram; 17 per ounce.

MEDICAL LICENSURE STATISTICS FOR 1938

ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

The Council on Medical Education and Hospitals of the American Medical Association presents herewith medical licensure statistics for the thirty-seventh consecutive year. The report covers the year 1938 and deals with statistics regarding (a) medical licensing boards of the United States, the District of Columbia, the territories and the possessions of the United States, (b) examining boards in medical specialties, (c) boards of examiners in the basic sciences, and (d) the National Board of Medical Examiners.

Official reports have been contributed by the medical licensing boards of all states, the District of Columbia, Alaska, the Canal Zone, Hawaii, Puerto Rico and the Virgin Islands; the homeopathic boards of Connecticut, Delaware, Louisiana and Maryland; the eclectic examining board in Arkansas; the twelve basic science boards in operation (Arizona, Arkansas, Colorado, Connecticut, the District of Columbia, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, Washington and Wisconsin), the thirteen approved examining boards in the medical specialties and the National Board of Medical Examiners. The homeopathic board of Louisiana did not license any one during the year. Likewise no physicians were licensed in the Canal Zone.

The cooperation of the officers of the boards in supplying complete reports has made possible this annual compilation. The Council and THE JOURNAL wish to express thanks and appreciation to those who have supplied these data, for without their help such presentation would not have been possible.

Reports of all examinations and those licensed by endorsement of credentials are carefully compared with the lists of graduates furnished by medical school officials, so that errors in names of candidates, the medical school or the years of graduation are promptly corrected. In the occasional instance in which the applicant, according to the records, has not graduated or there is some irregularity, the state board is notified. Credentials of physicians coming from abroad are verified by direct correspondence with official agencies abroad so far as is possible. The statements regarding the medical education and licensure therefore of all physicians are accurate.

The data were also entered in the biographic file of physicians and others maintained by the Directory Department of the American Medical Association, thus serving a dual purpose. More than thirty licensing boards obtain from the Council verification of biographic data and other claims before granting a license or permission to take the licensing examination. This service is available to all boards.

The tables referring to medical licensing board results include figures regarding the number of candidates for medical licensure in 1938, the number licensed and the number added to the profession.

LICENSES ISSUED

The first table presented in these statistics includes figures covering the number of licenses issued during the year in the various states, territories and posses-

sions. There were 9,493 licenses issued, 6,548 on the basis of examination and 2,945 by reciprocity and endorsement. In several states (table 12) the internship is a requisite for practice, but a physician is permitted to take the examination in most of these states and if successful his license is withheld until completion of his internship. Licenses are also withheld for lack of citizenship or minor technicalities. The figures,

TABLE 1—*Licenses Issued—1938*

	Licensed on Basis of		
	Examination	Reciprocity and Endorsement	Total
Alabama	29	45	74
Arizona	15	23	38
Arkansas	75	31	106
California	403	208	611
Colorado	78	36	114
Connecticut	73	72	145
Delaware	14	5	19
District of Columbia	33	66	99
Florida	133	0	133
Georgia	72	37	109
Idaho	28	0	28
Illinois	465	110	595
Indiana	109	73	182
Iowa	95	66	161
Kansas	92	30	122
Kentucky	79	58	137
Louisiana	167	32	199
Maine	38	15	53
Maryland	227	47	274
Massachusetts	207	105	312
Michigan	206	166	372
Minnesota	219	31	250
Mississippi	34	26	60
Missouri	174	69	243
Montana	11	36	47
Nebraska	85	11	96
Nevada	5	11	16
New Hampshire	15	30	45
New Jersey	281	152	433
New Mexico	2	31	33
New York	1,078	482	1,560
North Carolina	85	71	156
North Dakota	15	10	25
Ohio	351	124	475
Oklahoma	42	38	80
Oregon	33	18	71
Pennsylvania	513	81	594
Rhode Island	26	21	47
South Carolina	39	15	54
South Dakota	8	8	16
Tennessee	180	21	201
Texas	200	175	375
Utah	12	7	19
Vermont	23	21	44
Virginia	127	62	189
Washington	72	51	123
West Virginia	65	41	106
Wisconsin	114	44	158
Wyoming	7	8	15
U. S. Terr. and Possessions*	34	22	56
Totals	6,548	2,945	9,493
Totals for 1937	6,021	3,186	9,207
Totals for 1936	6,271	2,633	8,903
Totals for 1935	5,717	2,195	7,912

* Alaska, Hawaii, Puerto Rico, Virgin Islands

therefore, for those licensed after examination include many who were examined in 1937 and even a few in previous years. New York issued the largest number of licenses, 1,560, California 611, Illinois 595 and Pennsylvania 594. These states are the only ones which registered more than 500. Twenty states, the District of Columbia, Alaska, Hawaii, Puerto Rico and the Virgin Islands licensed less than 100. Candidates were licensed after examination in every state, the lowest being two in New Mexico. Alaska and the

(CONTINUED ON PAGE 1700)

Marginal Number

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
SCHOOL	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan
	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P
ARKANSAS																					
1 University of Arkansas School of Medicine...			69	0	1	0			0	1		1	0		2	0		2	0		
CALIFORNIA																					
2 College of Medical Evangelists.....				68	2	3	0			3	1	1	0	1	0		2	0			3
3 Stanford University School of Medicine.....				62	1		1	0				1	0								
4 University of California Medical School.....				58	0						1	0									2
5 University of Southern California Sch. of Med.				40	0												1	0		1	0
COLORADO																					
6 University of Colorado School of Medicine...				2	0	40	0				1	0	1	0					1	0	
CONNECTICUT																					
7 Yale University School of Medicine.....						1	0		2	0		1	0				1	0	1	0	
DISTRICT OF COLUMBIA																					
8 George Washington University School of Med.				2	0			15	0	2	0		2	0				1	0	1	0
9 Georgetown University School of Medicine.....				2	0		4	0	1	0	7	0	2	0				3	0	1	0
10 Howard University College of Medicine.....								1	0	1	0		1	0			1	0		1	0
GEORGIA																					
11 Emory University School of Medicine.....	5	0						15	5	32	0						2	0		1	0
12 University of Georgia School of Medicine.....	1	0						5	2	32	0										
ILLINOIS																					
13 Loyola University School of Medicine.....				5	0		1	1				76	0	2	0	1	0		1	0	3
14 Northwestern University Medical School.....	1	0	1	0		11	1	4	0	1	0		8	0	2	0	59	0	2	0	1
15 University of Chicago, Rush Medical College...	2	0		16	1		1	0		4	1		3	0	58	0	2	0	4	1	0
16 University of Chicago, The School of Medicine																					
of the Division of Biological Sciences.....	1	0		2	0				1	0	1	0		20	0	1	0	1	0		1
17 University of Illinois College of Medicine.....		2	0		10	0	1	0		1	0	6	1	133	0	3	0		1	0	
INDIANA																					
18 Indiana University School of Medicine.....												1	0	82	0			1	0		1
IOWA																					
19 State University of Iowa College of Medicine		1	0		6	0			2	0			1	0		78	10				
KANSAS																					
20 University of Kansas School of Medicine.....				2	0		1	0							67	0				1	0
KENTUCKY																					
21 University of Louisville School of Medicine..				5	0				5	1			2	0		76	1				1
LOUISIANA																					
22 Louisiana State University Medical Center....		1	0						1	0							65	0			
23 Tulane University of Louisiana Sch. of Med.	6	0		1	0				10	0	2	0					92	2			
MARYLAND																					
24 Johns Hopkins University School of Medicine						1	0	3	0		1	0		2	0	2	0		1	0	6
25 University of Maryland School of Medicine and						1	0		2	1							2	0	1	0	7
College of Physicians and Surgeons.....																					
MASSACHUSETTS																					
26 Boston University School of Medicine.....						1	0								1	0	1	0		3	0
27 Harvard Medical School.....	2	0		5	0		5	0		3	0	1	0		2	0	1	0		3	0
28 Tufts College Medical School.....		1	0		3	0		12	0		3	0					10	0	1	0	3
MICHIGAN																					
29 University of Michigan Medical School.....				2	0				4	1		1	0	2	1						5
30 Wayne University College of Medicine.....				2	0																0
MINNESOTA																					
31 University of Minnesota Medical School.....			1	0	2	0		1	0		1	0		1	0		4	0		2	0
MISSOURI																					
32 St. Louis University School of Medicine.....				11	1		1	1		2	1		3	0	1	0					1
33 Washington University School of Medicine.....	2	0	1	0		3	0		1	0	2	0		2	0		1	0			1
NEBRASKA																					
34 Creighton University School of Medicine.....		1	0		16	2	1	0	1	1			1	0		1	0		6	1	
35 University of Nebraska College of Medicine...		1	0		3	1			1	0		0	1		1	0					
NEW YORK																					
36 Albany Medical College.....						1	0			1	0										6
37 Columbia University School of Medicine.....			1	0	1	0			1	0		3	2		2	0			1	0	
38 Cornell University Medical College.....	2	0				2	0														0
39 Long Island University School of Medicine...			1	0		1	0		1	0											1
40 New York University School of Medicine.....			1	0		2	0			1	0										1
41 New York University School of Medicine.....				2	0		2	0		2	0			1	0			1	0	1	0
42 Syracuse University School of Medicine.....			1	0		1	0														1
43 University of Rochester School of Medicine...			1	0															1	0	2
44 University of Rochester School of Medicine...			2	0		1	0		1	0									1	0	2
NORTH CAROLINA																					
45 Duke University School of Medicine.....				2	0		1	0		2	0							1	0		
OHIO																					
46 Ohio State University College of Medicine...									3	1							1	0	1	0	
47 University of Cincinnati College of Medicine...																					1
48 Western Reserve University School of Medicine				1	0				2	0											
OKLAHOMA																					
49 University of Oklahoma School of Medicine..	1	0			1	1	2	0		1	1					3	0		1	0	
OREGON																					
50 University of Oregon Medical School.....				4	0							4	0	1	0		1	0	1	0	
PENNSYLVANIA																					
51 Hahnemann Medical Coll. and Hosp. of Phila.				1	0		0	1	2	0									1	0	3
52 Jefferson Medical College of Philadelphia.....	1	0		2	0		4	0	2	0		3	1	1	0		1	0			2
53 Temple University School of Medicine.....				1	0		1	0	2	0	1	0	5	1							1
54 University of Pennsylvania School of Medicine	1	0	2	0		3	0		2	0	1	0	4	2		1	0	1	0		
55 University of Pittsburgh School of Medicine...									3	0											1
56 Woman's Medical College of Pennsylvania.....				2	0																
SOUTH CAROLINA																					
57 Medical College of the State of South Carolina									2	0			1	0					1	0	
TENNESSEE																					
58 Meharry Medical College.....									1	0			1	0			1	0			0
59 University of Tennessee.....	1	0		1	0		1	0		6	2						1	0			1
60 Vanderbilt University.....	1	0							5	0	2	0	1	0							4

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	
Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Hawaii, Puerto Rico					Marginal Number	
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	88	86	2	2.3	15	1
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	95	91	4	4.2	17	2
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	92	71	1	1.4	7	3
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	92	62	0	0.0	4	4
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	44	43	1	2.3	5	5
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	52	52	0	0.0	12	6
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	9	9	0	0.0	8	7
3	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	65	66	2	2.9	17	8
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	101	94	7	6.9	20	9
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	34	33	1	2.9	12	10
3	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	77	72	5	6.5	12	11
0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	46	43	3	6.5	8	12
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	136	128	8	5.9	21	13
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	161	159	2	1.2	31	14
3	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	173	169	4	2.3	34	15
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	44	43	1	2.3	16	16
2	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	173	172	1	0.6	16	17
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	91	91	0	0.0	7	18
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	107	96	11	10.4	9	19
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	80	80	0	0.0	10	20
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	112	109	3	2.7	16	21
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	60	69	0	0.0	5	22
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	133	133	2	1.5	13	23
2	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	100	99	1	1.0	18	24
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	107	105	2	1.0	18	23
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	26	23	3	11.5	0	26
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	56	56	0	0.0	24	27
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	80	81	5	5.8	12	28
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	130	128	2	1.5	12	29
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	77	77	0	0.0	2	30
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	143	142	1	0.7	20	31
3	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	124	119	5	4.0	14	32
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	104	104	0	0.0	16	33
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	75	68	7	9.3	21	34
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	95	92	3	3.2	13	35
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	22	22	0	0.0	4	36
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	104	98	6	5.8	16	37
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	66	64	2	3.0	14	38
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	82	76	6	7.3	8	39
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	28	27	1	3.6	7	40
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	128	124	4	3.1	12	41
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	39	36	3	7.7	5	42
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	53	49	4	7.5	4	43
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	47	45	2	4.3	12	44
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	15	15	0	0.0	0	45
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	99	98	1	1.0	5	46
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	79	79	0	0.0	9	47
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	74	74	0	0.0	8	48
2	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	64	62	2	3.1	13	49
2	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	68	68	0	0.0	13	50
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	160	152	8	5.0	11	51
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	162	169	2	1.2	22	52
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	122	117	5	4.1	17	53
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	158	153	5	3.2	23	54
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	65	65	0	0.0	3	55
1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	31	28	3	9.7	8	56
1	0	1	0	1	0																											

TABLE 2—CANDIDATES EXAMINED

Marginal Number	SCHOOL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan
	TEXAS	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P
61	Baylor University College of Medicine				2	0				0	1											
62	University of Texas School of Medicine				1	0				1	0	1	0					1	0		2	0
	VERMONT																					
63	University of Vermont College of Medicine		1	0			6	0		1	0								1	0	1	0
	VIRGINIA																					
64	Medical College of Virginia						1	0		2	0	2	1									
65	University of Virginia Department of Medicine							1	0		2	0	1					1	0	1	0	1
	WISCONSIN																					
66	Marquette University School of Medicine				4	1	1	0		1	0	1	0	2	0							7
67	University of Wisconsin Medical School				2	0							2	0		2	0	1	0	1	0	1
	CANADA																					
68	Dalhousie University Faculty of Medicine	1	0																		1	0
69	Laval University Faculty of Medicine																					
70	McGill University Faculty of Medicine		1	0	9	1	2	0		1	0	1	0	2	0				0		2	0
71	Queen's University Faculty of Medicine						1	0										1	0	1	0	1
72	University of Alberta Faculty of Medicine														1	0						
73	University of Manitoba Faculty of Medicine									1	0	1	0		1	0						
74	University of Montreal Faculty of Medicine																		1	0	1	0
75	University of Toronto Faculty of Medicine				1	0	1	0		2	1		3	0							1	0
76	University of Western Ontario Medical School	1	0																			1
77	Foreign Medical Faculties	..			19	3	0	0	9	16		1	0	4	5	7	6	1	4	0	1	0
78	Extinct Medical Schools	..																		2	7	16
79	Unapproved Schools and Undergraduates	..	1	0	1	0	18	3	0	4	1	0	2	0					1	0	0	1
80	Totals		29	15	72	417	81	97	14	33	194	72	28	502	109	106	94	82	196	46	263	427
81	Totals—Examined—Passed		29	15	72	402	78	73	14	33	183	72	28	490	108	93	93	81	184	39	297	207
82	Totals—Examined—Failed		0	0	0	15	3	24	0	0	11	0	0	12	1	11	1	1	2	7	38	220
83	Percentage—Failed		0.0	0.0	0.0	3.6	3.7	24.7	0.0	0.0	21.1	0.0	0.0	2.4	0.0	10.4	1.1	1.2	1.1	15.7	14.3	51.0
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

P = Passed; F = Failed

(CONTINUED FROM PAGE 1697)

Virgin Islands licensed none by examination. Florida and Idaho grant licenses only on the basis of examination. Massachusetts and Rhode Island have no reciprocity privileges but endorse diplomates of the National Board of Medical Examiners. The total number licensed, 9,493, was 314 less than in 1937 but 460 more than in 1936 and 1,583 more than in 1935. On the basis of examination the figures decreased 73 and those licensed by reciprocity or endorsement decreased 241 compared with the figures for 1937. The 9,493 licenses issued do not, however, represent individuals, since several have been licensed in more than one state during the year. Nor does it represent additions to the medical profession at large, since the majority of the 2,945 licensed by reciprocity and endorsement, with the exception of those licensed on the basis of foreign credentials, and many of the National Board diplomates, have migrated from other states. Table 8 shows how many of those licensed were never before registered and therefore represent the number added to the medical profession.

TOTAL EXAMINED

In table 2 are included figures referring to those examined for medical licensure by individual states throughout the year, giving the number who passed and who failed in each state. There were 7,454 examined, of whom 6,582 passed and 872 failed, representing sixty-seven four year approved medical schools in the United States and eight of the medical schools of Canada, seventy-nine faculties of medicine and seven licensing corporations of other countries, eleven medical schools now extinct, eight unapproved institutions and several osteopathic colleges. Two undergraduates were examined. Osteopaths who were granted the

privilege to practice medicine, surgery or both by the medical boards are included in these statistics, eliminating, for instance, those osteopaths in California who were granted privileges as physicians and surgeons by the osteopathic board. There were 5,606 graduates of approved medical schools in the United States examined, of whom 29 per cent failed; 163 graduates of approved Canadian medical schools, 92 per cent of whom failed, 1,166 graduates of schools outside the United States and Canada, principally in Europe, with 38.6 per cent failures, thirteen who graduated from schools now extinct with 69.2 per cent of failures, and 504 from unapproved and osteopathic schools and two undergraduates, of whom 47.0 per cent failed. These 506 represented 163 graduates of osteopathic schools, of whom 101 passed and sixty-two, 38.0 per cent, failed; 341 graduates of unapproved schools, of whom 166 passed and 175, 51.3 per cent, failed, and two undergraduates, one of whom failed. The latter were examined in Mississippi and New Jersey. Graduates of osteopathic schools were examined by the medical boards of nine states—Colorado, Connecticut, District of Columbia, Massachusetts, New Hampshire, New Jersey, Oregon, Texas and Virginia—while graduates of unapproved schools were examined in twelve states and Hawaii—Arizona, Arkansas, Florida, Illinois, Massachusetts, New Jersey, New Mexico, New York, Ohio, Pennsylvania, Texas and Vermont. Of the 163 osteopaths, fifty-eight were examined in New Jersey, forty-one in Massachusetts, thirty-four in Texas and twenty-one in Colorado. Other states examined fewer than five. Of those graduates of other than recognized schools, Massachusetts examined 223, Illinois sixty-four, Ohio thirty-two and New Jersey seven. All other states examined fewer than five. Osteopaths in Colorado, Massachusetts, New Hampshire, New

ined in ten states. The highest percentage of failures was 27.3, representing the University of Western Ontario Medical School; of eleven examined, three failed.

Nineteen medical schools had no failures before state licensing boards, namely the Universities of California, Colorado, Yale, Indiana, Kansas, Louisiana State, Harvard, Wayne, Washington, Albany, Duke, Cincinnati,

in 1937; twelve less passed but the failures increased 141. Elsewhere are given figures representing actual licentiates and additions to the medical profession.

GRADUATES OF 1936, 1937 AND 1938 EXAMINED FOR MEDICAL LICENSURE IN 1938

In table 3 are presented figures recording graduates of 1936, 1937 and 1938 examined for medical licensure in 1938. Altogether 6,118 were examined, 5,669 of

TABLE 3.—*Graduates of 1936, 1937 and 1938 Examined for Medical Licensure in 1938*

School	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	Number of Boards Examined by
ARKANSAS					
University of Arkansas School of Medicine.....	87	85	2	2.3	15
CALIFORNIA					
College of Medical Evangelists.....	90	87	3	3.3	16
Stanford University School of Medicine.....	70	69	1	1.4	5
University of California Medical School.....	61	61	0	0.0	3
University of Southern California School of Med..	43	43	0	0.0	4
COLORADO					
University of Colorado School of Medicine.....	48	48	0	0.0	8
CONNECTICUT					
Yale University School of Medicine.....	5	5	0	0.0	5
DISTRICT OF COLUMBIA					
George Washington University School of Medicine.	64	62	2	3.1	16
Georgetown University School of Medicine.....	95	89	6	6.3	18
Howard University College of Medicine.....	29	29	0	0.0	11
GEORGIA					
Emory University School of Medicine.....	68	65	3	4.4	10
University of Georgia School of Medicine.....	41	39	2	4.9	6
ILLINOIS					
Loyola University School of Medicine.....	131	123	8	6.1	20
Northwestern University Medical School.....	144	143	1	0.7	30
University of Chicago, Rush Medical College.....	164	161	3	1.8	32
University of Chicago, The School of Medicine of the Division of Biological Sciences.....	40	39	1	2.5	14
University of Illinois College of Medicine.....	164	164	0	0.0	14
INDIANA					
Indiana University School of Medicine.....	87	87	0	0.0	5
IOWA					
State University of Iowa College of Medicine.....	103	92	11	10.7	8
KANSAS					
University of Kansas School of Medicine.....	72	72	0	0.0	5
KENTUCKY					
University of Louisville School of Medicine.....	101	99	2	2.0	15
LOUISIANA					
Louisiana State University Medical Center.....	69	69	0	0.0	5
Tulane University of Louisiana School of Medicine	127	125	2	1.6	13
MARYLAND					
Johns Hopkins University School of Medicine.....	79	78	1	1.3	11
University of Maryland School of Medicine and Col- lege of Physicians and Surgeons.....	105	104	1	1.0	13
MASSACHUSETTS					
Boston University School of Medicine.....	19	18	1	5.3	6
Harvard Medical School.....	51	51	0	0.0	21
Tufts College Medical School.....	64	63	1	1.6	9
MICHIGAN					
University of Michigan Medical School.....	120	119	1	0.8	10
Wayne University College of Medicine.....	77	77	0	0.0	2
MINNESOTA					
University of Minnesota Medical School.....	128	127	1	0.8	16
MISSOURI					
St. Louis University School of Medicine.....	118	116	2	1.7	13
Washington University School of Medicine.....	99	99	0	0.0	15
NEBRASKA					
Creighton University School of Medicine.....	72	65	7	9.7	19
University of Nebraska College of Medicine.....	85	85	0	0.0	11
NEW YORK					
Albany Medical College.....	20	20	0	0.0	2
Columbia University College of Physicians and Surgeons.....	83	81	2	2.4	11
Cornell University Medical College.....	57	57	0	0.0	12
NEW YORK (Continued)					
Long Island College of Medicine.....	79	75	4	5.1	7
New York Medical College and Flower Hospital....	24	24	0	0.0	5
New York University College of Medicine.....	119	116	3	2.5	10
Syracuse University College of Medicine.....	38	35	3	7.9	4
University of Buffalo School of Medicine.....	52	48	4	7.7	3
University of Rochester School of Medicine.....	37	36	1	2.7	6
NORTH CAROLINA					
Duke University School of Medicine.....	13	13	0	0.0	8
OHIO					
Ohio State University College of Medicine.....	96	96	0	0.0	4
University of Cincinnati College of Medicine.....	77	77	0	0.0	9
Western Reserve University School of Medicine.....	67	67	0	0.0	5
OKLAHOMA					
University of Oklahoma School of Medicine.....	63	61	2	3.2	13
OREGON					
University of Oregon Medical School.....	64	64	0	0.0	13
PENNSYLVANIA					
Hahnemann Medical College and Hospital of Phila- delphia.....	156	149	7	4.5	10
Jefferson Medical College of Philadelphia.....	146	146	0	0.0	19
Temple University School of Medicine.....	114	110	4	3.5	14
University of Pennsylvania School of Medicine....	141	137	4	2.8	21
University of Pittsburgh School of Medicine.....	61	61	0	0.0	2
Woman's Medical College of Pennsylvania.....	25	27	1	3.8	8
SOUTH CAROLINA					
Medical College of the State of South Carolina....	45	45	0	0.0	6
TENNESSEE					
Meharry Medical College.....	40	36	4	10.0	5
University of Tennessee College of Medicine.....	97	96	1	1.0	6
Vanderbilt University School of Medicine.....	56	56	0	0.0	10
TEXAS					
Baylor University College of Medicine.....	86	84	2	2.3	9
University of Texas School of Medicine.....	87	84	3	3.4	7
VERMONT					
University of Vermont College of Medicine.....	31	31	0	0.0	6
VIRGINIA					
Medical College of Virginia.....	86	86	0	0.0	11
University of Virginia Department of Medicine....	60	59	1	1.7	6
WISCONSIN					
Marquette University School of Medicine.....	67	65	2	3.0	10
University of Wisconsin Medical School.....	43	43	0	0.0	9
CANADA					
Dalhousie University Faculty of Medicine.....	13	13	0	0.0	5
Laval University Faculty of Medicine.....	0	0	0	0.0	0
McGill University Faculty of Medicine.....	45	43	2	4.4	19
Queen's University Faculty of Medicine.....	13	12	1	7.7	5
University of Alberta Faculty of Medicine.....	2	2	0	0.0	2
University of Manitoba Faculty of Medicine.....	5	5	0	0.0	2
University of Montreal Faculty of Medicine.....	2	2	0	0.0	2
University of Toronto Faculty of Medicine.....	13	12	1	7.7	7
University of Western Ontario Medical School....	6	5	1	16.7	3
Foreign Medical Faculties.....	507	322	185	36.5	18
Unapproved Schools.....	359	210	149	41.5	17
Totals.....	6,118	5,669	449	7.3	
Totals—Examined—Passed.....		5,669			
Totals—Examined—Failed.....			449		
Percentage—Failed.....				7.3	

Western Reserve, Oregon, Pittsburgh, South Carolina, Vanderbilt, Vermont and Wisconsin.

Thirteen graduates of medical schools now extinct were examined in four states with 69.2 per cent failures, a total of 1,166 graduates of medical schools outside the United States and Canada were examined in twenty-eight states, while 506 unapproved graduates and undergraduates were examined in twenty states.

In 1937, 7,325 were examined, of whom 6,594 passed and 731, 10.0 per cent, failed, as compared with 7,454 examined in 1938, of whom 6,582 passed and 872, 11.7 per cent, failed. There were 129 more examined than

whom passed and 449, 7.3 per cent, failed. Of these, 5,153 represented medical graduates of sixty-seven approved medical schools in the United States, of whom 5,043 passed and 110, 2.1 per cent, failed. Ninety-nine graduates of eight approved schools in Canada were examined, ninety-four of whom passed and five failed. There were 507 recent graduates of medical faculties outside the United States and Canada examined, of whom 322 passed and 185, 36.5 per cent, failed. There were also examined 359 graduates of medical schools not approved by the American Medical Association, of whom 210 passed and 149, 41.5 per cent, failed. Of

United States schools 2.1 per cent failed, of the Canadian graduates 5.1 per cent failed, of those educated outside the United States and Canada 36.5 per cent failed, and of graduates of unapproved schools 41.5 per cent failed. Of the United States graduates, the school having the highest percentage of failures, 10.7; was the State University of Iowa College of Medicine, whose graduates were examined in eight states. Ten per cent of the graduates of Meharry Medical College failed, while 16.7 per cent of the graduates of the University of Western Ontario Medical School failed. Twenty-eight schools in the United States had no failures among its recent graduates examined for medical licensure in 1938. Graduates of Rush Medical College were examined in thirty-two states, Northwestern graduates in thirty, Harvard and the University of Pennsylvania in twenty-one, and Loyola in twenty states. Two states licensed recent graduates of Wayne, Albany and Pittsburgh. The greatest number examined by any one state was New York, 1,014, Pennsylvania was second with 489, Illinois examined 451, California 379 and Ohio 322.

More than 100 were examined from sixteen schools, the highest being the 164 graduates each of Rush Medical College and the University of Illinois College of Medicine. Forty-five graduates of McGill University Faculty of Medicine were examined in nineteen states, while none from Laval University Faculty of Medicine were examined. Only five graduates of Yale during the years named were examined in five states and only thirteen graduates of Duke University School of Medicine, who were examined in eight states. Of these two schools, as shown in table 2, Yale had only nine graduates of all years examined, none of whom failed, and Duke fifteen, with no failures. The State University of Iowa had 107 graduates of all years examined with 10.4 per cent failures, while Meharry had forty-four examined with 11.4 per cent failures.

The figures shown in table 3 are subdivided by years in the following tabulation:

Graduates of	1936		1937		1938	
	Passed	Failed	Passed	Failed	Passed	Failed
Medical schools in the United States.....	379	15	1,358	37	3,306	58
Medical schools in Canada....	23	2	48	2	23	1
Foreign faculties of medicine..	120	82	153	81	49	22
Unapproved medical schools and osteopaths	28	46	42	67	140	36
Totals	550	145	1,601	187	3,518	117

Of the 3,364 graduates of approved medical schools in the United States examined in 1938, fifty-eight failed, while thirty-seven of the 1,395 examined in 1937 failed and fifteen of the 394 examined in 1936 failed. The greatest percentage of failures was among the unapproved graduates.

FAILURES

In table 4 are presented for each state the number of candidates examined or granted licenses by endorsement or reciprocity and the number licensed after one failure and after two or more failures, these two groups being classified by indication whether the failure or failures have been in the state in which they are receiving a license or elsewhere.

Of the total number examined or endorsed, 9,527, 357 failed, 182 after one examination in the state in

which they were licensed in 1938 and sixty-three elsewhere, while eighty-five failed more than once in the state awarding the 1938 license and twenty-seven elsewhere, leaving 9,170 licensed without ever having failed a medical licensing examination.

In the computation of this table it was noted that an osteopath was licensed in Massachusetts who was unsuccessful in passing the examination in Massachusetts on six occasions. Of the graduates of unapproved

TABLE 4.—Failures Before Medical Licensing Boards by Licentiate of 1938

	Number Examined or Registered by Reciprocity or Endorsement	Number Licensed After One Failure		Number Licensed After Two or More Failures	
		Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere
Alabama.....	74	..	2	..	..
Arizona.....	38	..	..	..	..
Arkansas.....	103	..	..	..	..
California.....	610	4	6	2	2
Colorado.....	114	..	..	..	..
Connecticut.....	145	1	2	1	..
Delaware.....	19	..	..	..	..
District of Columbia.....	99	..	2	..	1
Florida.....	153	5	1	1	1
Georgia.....	109	..	..	..	..
Idaho.....	28	..	..	..	..
Illinois.....	600	1	2	2	2
Indiana.....	181	1	1	..	..
Iowa.....	161	..	2	..	..
Kansas.....	123	..	1	..	..
Kentucky.....	139	..	1	..	..
Louisiana.....	216	2	..	..	..
Maine.....	54	..	..	..	..
Maryland.....	274	2	2	2	..
Massachusetts.....	312	12	3	21	1
Michigan.....	301	1	1	..	..
Minnesota.....	250	..	..	..	..
Mississippi.....	57	..	..	..	..
Missouri.....	243	3	..	..	..
Montana.....	47	..	2	..	..
Nebraska.....	96	..	..	..	..
Nevada.....	16	..	..	..	..
New Hampshire.....	46	..	2	..	1
New Jersey.....	433	17	12	5	5
New Mexico.....	33	..	..	..	..
New York.....	1,560	123	7	48	12
North Carolina.....	156	..	..	..	..
North Dakota.....	25	..	..	..	..
Ohio.....	466	1	2	..	..
Oklahoma.....	84	..	..	..	..
Oregon.....	71	..	..	..	..
Pennsylvania.....	593	1	3	..	..
Rhode Island.....	47	1	..	..	..
South Carolina.....	57	..	..	..	..
South Dakota.....	16	..	..	..	..
Tennessee.....	200	..	2	..	..
Texas.....	375	5	2	..	2
Utah.....	19	..	..	..	..
Vermont.....	47	..	1	..	..
Virginia.....	180	..	..	..	..
Washington.....	123	..	1	..	..
West Virginia.....	106	..	2	..	..
Wisconsin.....	158	..	..	..	..
Wyoming.....	15	..	..	..	..
Hawaii, Puerto Rico.....	56	2	1	..	..
Totals.....	9,527	182	63	85	27

schools licensed in Massachusetts five failed four previous examinations, four had five failures before successfully passing, two failed nine times, one failed twelve times and another failed at fourteen examinations. New Hampshire granted a license by endorsement to a candidate who failed examinations in other states seven times. New Jersey issued licenses to two individuals with five failures. In New York, four had four previous failures, one failed five times and another had six unsuccessful examinations, while still another had seven unsuccessful examinations. Texas endorsed a candidate with seven failures.

TABLE 5.—*Credentials Presented by Physicians for Licensure by Reciprocity and Endorsement—1938*[illegible]

* Alaska, Hawaii, Puerto Rico, Virgin Islands.

Twenty-two states licensed physicians who never failed a state board examination, while New York licensed 190, Massachusetts forty and New Jersey thirty-nine who previously failed. Licensure of candidates with failures occurred in twenty-six states, the District of Columbia, Hawaii and Puerto Rico but, with the exception of Massachusetts, New Jersey and New York, no state licensed more than fifteen.

REGISTRATION BY RECIPROCITY AND ENDORSEMENT

The number of physicians granted licenses to practice medicine and surgery without examination on presentation of satisfactory credentials are given in table 5. There were 2,902 so registered who presented licenses from other states, Canada and foreign countries, the certificate of the National Board of Medical Examiners, one of the government services, or other credentials.

Definite reciprocal relations are reported by twenty-four states. Twenty-six states, including five that have regularly established reciprocal relations, will register licentiates who present credentials which correspond to those required by their respective states at the time such licenses were issued. The medical practice acts of many give the examining board the privilege of using its discretion in determining the acceptability of a candidate. The reciprocity and endorsement policies of the various states are presented in table 6. In addition there is also indicated whether licenses are granted to diplomates of the National Board of Medical Examiners or to retired officers of the government services. Specific requirements such as professional practice, basic science certificate, oral examination and internship is recorded, as is also the fee demanded. Florida, Idaho, Massachusetts and Rhode Island do not have reciprocal or endorsement arrangements with any state. Massachusetts and Rhode Island, however, will register diplomates of the National Board of Medical Examiners by endorsement. Those desiring licenses by this method in Arizona, Arkansas, Colorado, Connecticut, District of Columbia, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, Washington and Wisconsin are required to obtain a certificate from the board of examiners in the basic sciences before being eligible for licensure. Some states have additional requirements for graduates of schools outside the United States and Canada. Other requirements or exemptions are mentioned in footnotes.

In table 5 it will be noted that New York granted the greatest number of licenses by endorsement in 1938 (482), California the second highest (208), Michigan 166, New Jersey 152, Texas 138, Ohio 124, Illinois 110 and Massachusetts 105. All other states licensed fewer than 100 by this method. The largest group representing the same type of credentials were the 673 diplomates of the National Board of Medical Examiners. More than 100 physicians holding licenses in Illinois, Maryland, Missouri, New York, Ohio and Tennessee, respectively, were licensed in the various states. Twenty-nine physicians were certified on the basis of Canadian and foreign credentials. Only 175 physicians with New York licenses secured certificates elsewhere, while 482 were registered in New York on the basis of credentials. The number of physicians registered in New York on the basis of foreign credentials was twenty-one, whereas in 1937 it was 146. During the year the New York Board of Regents ruled that all would be required to pass examinations. The Regents' decision was

appealed in a test case and the Supreme Court issued an order restraining the Regents from requiring foreign born physicians to pass an examination before practicing in New York. The Appellate Division of the Supreme Court supported the position taken by the Regents. The Regents are not endorsing any foreign licenses but requiring that all applicants take the regular medical examination.

One physician in the District of Columbia was licensed on the basis of German credentials by a special act of Congress. One was registered in Missouri on Canadian credentials. Five in New Hampshire were issued licenses by endorsement of credentials from Canada and Quebec one each and Germany three. The twenty-one in New York represented one with Russian credentials, two with Austrian and eighteen German degrees. One candidate in Vermont was certified on the basis of English credentials. Altogether, twenty-nine were licensed by five states.

Three states accepted credentials from Hawaii and Puerto Rico. One was endorsed by presentation of a Hawaiian license in California, and one in Montana and six in New York by endorsement of licenses issued in Puerto Rico. In addition, five were admitted to private practice in the Virgin Islands.

Not included in the table are forty-three osteopaths licensed by the board of medical examiners in five states, namely one in New Hampshire and thirty-seven in Texas granted the right to practice medicine and surgery, one each in Oregon and Wyoming licensed to practice osteopathy and surgery, and three granted this privilege in Wisconsin. Likewise excluded are those osteopaths granted licenses to practice medicine and surgery in California.

Of the five homeopathic boards in existence—Arkansas, Connecticut, Delaware, Louisiana and Maryland—only two issued licenses by endorsement, Connecticut and Delaware, which licensed two and one respectively. The Eclectic Board in Arkansas also registered one.

Diplomates of the National Board of Medical Examiners were registered in thirty-eight states, the District of Columbia, Alaska, Hawaii and Puerto Rico.

Maryland had the greatest number of its licentiates registered in any state, sixty-four, who were given the right to practice in New York. Alabama, Arizona, Connecticut, Delaware, Florida, Idaho, Montana, New Hampshire, North Dakota, Rhode Island, South Dakota, Utah, Washington and Wyoming had less than ten of their licentiates endorsed to other states. Two states had no physicians endorsed—Nevada and New Mexico. Arizona had only one endorsed, and Florida, New Hampshire, North Dakota, Rhode Island and Wyoming only two.

Included in the group at the side of the table listed as "U. S. Territories and Possessions" are Alaska, Hawaii, Puerto Rico and Virgin Islands.

A total of 2,902 physicians secured licenses by this method in 1938.

The physicians licensed by reciprocity and endorsement in 1938 and, in addition, forty-three osteopaths so licensed by medical examining boards are recorded by school of graduation and state or territory where licensed in table 7. All the four year medical schools in the United States (sixty-seven) and nine in Canada were represented. The largest number of graduates of any one school were from Harvard Medical School,

ninety-eight, who were licensed in twenty-nine states. Georgetown had eighty-seven licensed by this method in seventeen states, the University of Nebraska eighty-three in twenty-five states, and Northwestern seventy-seven in thirty states. Graduates of forty-two faculties of medicine in Europe and seven licensing corporations

approved medical schools in the United States, forty-six graduates of nine approved medical schools in Canada, 115 graduates of European institutions, fifty-three of medical schools now extinct, twenty graduates of unapproved medical schools and forty-three osteopaths.

TABLE 6.—Reciprocity

Compilation of data furnished by state examining boards. This information is not guaranteed, as there may have been

		Reciprocates with, or Endorses Certificates Granted by																																
Marginal Number	The Examining Board of	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	Marginal Number		
1	Alabama.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
2	Arizona.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas (regular board).....	+	..	..	..	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
4	California.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	Colorado.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Connecticut (regular board).....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
7	Delaware (regular board).....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	Dist. of Columbia.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida.....	No reciprocity or endorsement policies	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	Georgia.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10
11	Idaho.....	No reciprocity or endorsement policies	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
12	Illinois.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12
13	Indiana.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
14	Iowa.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
15	Kansas.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16	Kentucky.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
17	Louisiana (regular board).....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17
18	Maine.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18
19	Maryland (regular board).....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19
20	Massachusetts.....	No reciprocal relations	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
21	Michigan.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21
22	Minnesota.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22
23	Mississippi.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	23
24	Missouri.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24
25	Montana.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25
26	Nebraska.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26
27	Nevada.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	27
28	New Hampshire.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28
29	New Jersey.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	29
30	New Mexico.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30
31	New York.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	North Carolina.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
33	North Dakota.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	33
34	Ohio.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	34
35	Oklahoma.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
36	Oregon.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36
37	Pennsylvania.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
38	Rhode Island.....	No reciprocal relations	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	38
39	South Carolina.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	39
40	South Dakota.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40
41	Tennessee.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	41
42	Texas.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42
43	Utah.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	43
44	Vermont.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45
46	Washington.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46
47	West Virginia.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47
48	Wisconsin.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48
49	Wyoming.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50
51	Hawaii.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51
52	Puerto Rico.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52

Some states have additional requirements for graduates of schools outside the United States and Canada.

1. 1st P, first papers required; +, full citizenship required.
2. In most cases there is a small additional recording or registration fee.
3. If state of original license grants similar privileges.
4. Internship accepted in lieu of one year's practice.
5. Professional practice required.
6. No professional practice required.
7. Just preceding application.
8. No basic science reciprocity—examination must be within the state.
9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.

10. Reserve officers not eligible.
11. Applicant's diplomate certificate must be dated not less than one year prior to the filing date in California of an application; applicant must also have been a resident of some state or territory of the United States for a period of at least one year after the date of his diplomate certificate.
12. Oral examination required when original license is ten or more years old.
13. Applicant must have resided in the state used as basis of application for one year after date on said certificate.
14. Oral examination required.
15. Unless in practice in another state for five years.
16. Six months of which must be just preceding application.
17. Practical, clinical examination required.

of Great Britain, three unapproved institutions and several osteopathic schools were licensed without examination. Graduates of thirty-six schools now extinct were also represented.

Of the 2,945 candidates licensed by reciprocity and endorsement, 2,668 were graduates of sixty-seven

CANDIDATES ADDED TO THE PROFESSION
Licentiates representing additions to the profession during 1938 are recorded in table 8. The figures represent candidates examined in 1938 and licensed; also those examined

basis of the certificate of the National Board of Medical Examiners, government services, Canadian and foreign credentials. In the main they represent recent graduates. Altogether, 6,252 were added to the profession. The number removed by death annually approximates 4,000. These figures indicate that at least 2,000 were

1,204; Illinois added 464 and Pennsylvania 452, while South Dakota added only two. More than 300 were added in California and Ohio. Between 200 and 300 were added to the physician population of Maryland, Massachusetts, Michigan, New Jersey and Texas. Indiana, Louisiana, Minnesota, Missouri, Tennessee,

and Endorsement Policies

changes of which this office has not been advised. For an authentic statement write directly to the medical board.

Reelproates with, or Endorses Certificates Granted by		Requirements	
Marginal Number			Marginal Number
1	New York	1 ¹	Professional Practice
2	North Carolina	3 ¹	Citizenship ¹
3	North Dakota	1 ¹	Fees, Dollars ²
4	Ohio	1 ¹	Miscellaneous
5	Oklahoma	1 ¹	
6	Oregon	1 ¹	
7	Pennsylvania	1 ¹	
8	Rhode Island	1 ¹	
9	South Carolina	1 ¹	
10	South Dakota	1 ¹	
11	Tennessee	1 ¹	
12	Texas	1 ¹	
13	Utah	1 ¹	
14	Vermont	1 ¹	
15	Virginia	1 ¹	
16	Washington	1 ¹	
17	West Virginia	1 ¹	
18	Wisconsin	1 ¹	
19	Wyoming	1 ¹	
20	Alaska	1 ¹	
21	Puerto Rico	1 ¹	
22	At the Discretion of the Board	1 ¹	
23	National Board of Medical Examiners	1 ¹	
24	U. S. Government Services	1 ¹	
25	Basic Science Certificate	1 ¹	
26	Internship	1 ¹	
27	Professional Practice	1 ¹	
28	Citizenship ¹	1 ¹	
29	Fees, Dollars ²	1 ¹	
30	Miscellaneous	1 ¹	
31		1 ¹	
32		1 ¹	
33		1 ¹	
34		1 ¹	
35		1 ¹	
36		1 ¹	
37		1 ¹	
38		1 ¹	
39		1 ¹	
40		1 ¹	
41		1 ¹	
42		1 ¹	
43		1 ¹	
44		1 ¹	
45		1 ¹	
46		1 ¹	
47		1 ¹	
48		1 ¹	
49		1 ¹	
50		1 ¹	
51		1 ¹	
52		1 ¹	

18. Same as charged Kansas.

19. Regular and Homeopathic boards.

20. Required of graduates of foreign medical schools.

21. Regular board.

22. Fee same as applicant's state charges if more than \$50.

23. Oral examination required if applicant's state requires it.

24. If an applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.

25. Internship accepted if served in this state.

26. Internship accepted—considered equivalent to two years' practice.

27. Five years' practice.

28. Conditionally.

29. A two year internship is accepted.

30. License by National Board certificate at examination fee of \$15 unless holding a license from another state.

31. Clinical examination required.

32. Reciprocity applicants only.

33. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.

34. May be licensed after a special (written) supplemental examination.

35. Fee for license on basis of National Board certificate \$25.

36. For matriculants after Oct. 17, 1937.

37. After July 1, 1939.

38. While in active duty only.

39. Permanent license withheld until completion of citizenship.

added to the medical profession in 1938. It is assumed that the great majority of those licensed are in practice. It is interesting to note that, of 9,493 licenses issued throughout the year, 6,252 are actual additions to the medical profession. The largest number in any one state added to the profession was in New York,

Virginia and Wisconsin increased their population of physicians by between 100 and 200. Thirty-one states, the District of Columbia, Alaska, Hawaii and Puerto Rico added less than 100. Of the number of licentiates representing additions to the medical profes-

(CONTINUED ON PAGE 1710)

TABLE 7.—Candidates Licensed by Reciprocity and Endorsement—1938

[illegible]

(CONTINUED FROM PAGE 1707)

sion during 1938, 5,755 secured this privilege by examination and 497 by the endorsement of credentials. Those licensed by endorsement consist of a few licensed on foreign credentials and to a large extent diplomates of the National Board of Medical Examiners. Figures for three previous years and 1938 are shown here for comparison:

Licentiatees Representing Additions to the Medical Profession in Four Years

Year	Examination	Reciprocity and Endorsement	Total
1935.....	5,098	411	5,509
1936.....	5,546	628	6,174
1937.....	5,808	602	6,410
1938.....	5,755	497	6,252

In 1935 there were 5,098 added by means of examination and 411 by endorsement of credentials, a total of 5,509. In 1936 there were 665 more added than in 1935; in 1937, 236 more than in 1936 and 901 more

TABLE 8.—Licentiatees Representing Additions to the Medical Profession—1938

	Examination	Reciprocity and Endorsement	Total
Alabama.....	25	..	25
Arizona.....	11	..	11
Arkansas.....	73	..	73
California.....	361	0	370
Colorado.....	73	1	74
Connecticut.....	54	30	84
Delaware.....	7	..	7
District of Columbia.....	25	12	37
Florida.....	34	..	34
Georgia.....	69	4	73
Idaho.....	8	..	9
Illinois.....	456	8	464
Indiana.....	104	2	106
Iowa.....	87	3	90
Kansas.....	87	..	87
Kentucky.....	79	5	84
Louisiana.....	153	..	153
Maine.....	27	1	28
Maryland.....	218	8	226
Massachusetts.....	147	76	223
Michigan.....	193	7	200
Minnesota.....	155	8	163
Mississippi.....	32	1	33
Missouri.....	166	6	172
Montana.....	3	1	4
Nebraska.....	84	..	84
Nevada.....	3	..	3
New Hampshire.....	13	8	21
New Jersey.....	234	15	249
New Mexico.....	2	1	3
New York.....	1,027	177	1,204
North Carolina.....	83	4	87
North Dakota.....	5	2	7
Ohio.....	345	15	360
Oklahoma.....	39	..	39
Oregon.....	42	2	44
Pennsylvania.....	438	14	452
Rhode Island.....	16	13	29
South Carolina.....	39	2	41
Tennessee.....	178	5	183
Texas.....	192	35	227
Utah.....	11	..	11
Vermont.....	18	4	22
Virginia.....	124	1	125
Washington.....	56	7	63
West Virginia.....	28	..	28
Wisconsin.....	105	3	108
Wyoming.....	3	..	3
U. S. Territories and Possessions*.....	20	7	27
Totals.....	5,755	497	6,252

* Alaska, Hawaii, Puerto Rico.

than in 1935. In 1938 there were 158 fewer than in 1937 but seventy-eight more than in 1936 and 743 more than in 1935. Physicians were added in Alaska, Hawaii and Puerto Rico in 1938.

Table 9 records the licentiatees representing additions to the medical profession grouped in nine geographic divisions in 1938; namely the New England, Middle

Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain and Pacific states as well as Alaska, Hawaii and Puerto Rico. The largest number, 1,905, was added to the Middle Atlantic group, the East North

TABLE 9.—Licentiatees Representing Additions to the Medical Profession Grouped in Geographic Divisions—1938

	Examination	Reciprocity and Endorsement	Total
New England			
Maine.....	27	1	28
New Hampshire.....	13	8	21
Vermont.....	18	4	22
Massachusetts.....	147	76	223
Rhode Island.....	16	13	29
Connecticut.....	54	30	84
	275	132	407
Middle Atlantic			
New York.....	1,027	177	1,204
New Jersey.....	234	15	249
Pennsylvania.....	438	14	452
	1,699	206	1,905
East North Central			
Ohio.....	345	15	360
Indiana.....	104	2	106
Illinois.....	456	8	464
Michigan.....	193	7	200
Wisconsin.....	105	3	108
	1,203	35	1,238
West North Central			
Minnesota.....	155	8	163
Iowa.....	87	3	90
Missouri.....	166	6	172
North Dakota.....	5	2	7
South Dakota.....	2	..	2
Nebraska.....	84	..	84
Kansas.....	87	..	87
	586	19	605
South Atlantic			
Delaware.....	7	..	7
Maryland.....	218	8	226
District of Columbia.....	25	12	37
Virginia.....	124	1	125
West Virginia.....	28	..	28
North Carolina.....	83	4	87
South Carolina.....	39	2	41
Georgia.....	69	4	73
Florida.....	34	..	34
	627	31	658
East South Central			
Kentucky.....	79	5	84
Tennessee.....	178	5	183
Alabama.....	25	..	25
Mississippi.....	32	1	33
	314	11	325
West South Central			
Arkansas.....	73	..	73
Louisiana.....	153	..	153
Oklahoma.....	39	..	39
Texas.....	192	35	227
	457	35	492
Mountain			
Montana.....	3	1	4
Idaho.....	9	..	9
Wyoming.....	3	..	3
Colorado.....	73	1	74
New Mexico.....	2	1	3
Arizona.....	11	..	11
Utah.....	11	..	11
Nevada.....	3	..	3
	115	3	118
Pacific			
Washington.....	56	7	63
Oregon.....	42	2	44
California.....	261	9	270
	459	18	477
Territories and Possession			
Alaska.....	..	1	1
Hawaii.....	8	5	13
Puerto Rico.....	12	1	13
	20	7	27
Totals.....	5,755	497	6,252

Central 1,238, the South Atlantic 658, the West North Central 605, the West South Central 492, the Pacific 477, the New England group of states 407, the East South Central 325, and the Mountain division 118. Thirteen each were added in Hawaii and Puerto Rico and one in Alaska.

In table 10 those representing additions to the medical profession are arranged by schools; the same as those examined are listed in table 2, existing approved medical schools in the United States and Canada, foreign faculties of medicine, schools now extinct and unapproved schools and undergraduates.

The 6,252 physicians representing additions to the medical profession included graduates from the sixty-seven approved medical schools of the United States, eight approved schools in Canada, and others. The

119 and by reciprocity or endorsement sixteen. There were 668 graduates of foreign faculties of medicine, two from extinct medical schools and 282 unapproved graduates and undergraduates. Altogether there were 5,755 graduates of all schools examined, 497 by reciprocity or endorsement, a total of 6,252.

STATE REQUIREMENTS OF PRELIMINARY EDUCATION

Since 1918 the minimum requirement of preliminary education exacted by the Council on Medical Edu-

TABLE 10.—*Licentiates Representing Additions to the Medical Profession Classified by Schools, 1938*

School	Examination	Reciprocity and Endorsement	Total	School	Examination	Reciprocity and Endorsement	Total
ARKANSAS				NEW YORK			
University of Arkansas School of Medicine.....	80	1	81	Albany Medical College.....	20	5	25
CALIFORNIA				Columbia University College of Phys. and Surgs....	78	12	90
College of Medical Evangelists.....	83	17	100	Cornell University Medical College.....	56	17	73
Stanford University School of Medicine.....	67	1	68	Long Island College of Medicine.....	74	6	80
University of California Medical School.....	69	..	69	New York Medical College and Flower Hospital.....	27	38	65
University of Southern California School of Medicine	43	..	43	New York University College of Medicine.....	115	9	124
COLORADO				Syracuse University College of Medicine.....	36	3	39
University of Colorado School of Medicine.....	45	1	46	University of Buffalo School of Medicine.....	47	3	50
CONNECTICUT				University of Rochester School of Medicine.....	42	..	42
Yale University School of Medicine.....	7	30	37	NORTH CAROLINA			
DISTRICT OF COLUMBIA				Duke University School of Medicine.....	14	19	33
George Washington University School of Medicine...	60	4	64	OHIO			
Georgetown University School of Medicine.....	90	43	133	Ohio State University College of Medicine.....	92	..	92
Howard University College of Medicine.....	30	1	31	University of Cincinnati College of Medicine.....	67	..	67
GEORGIA				Western Reserve University School of Medicine.....	62	1	63
Emory University School of Medicine.....	53	1	54	OKLAHOMA			
University of Georgia School of Medicine.....	34	..	34	University of Oklahoma School of Medicine.....	53	..	53
ILLINOIS				OREGON			
Loyola University School of Medicine.....	107	2	109	University of Oregon Medical School.....	55	1	56
Northwestern University Medical School.....	129	4	133	PENNSYLVANIA			
University of Chicago, Rush Medical College.....	142	4	146	Hahnemann Medical College and Hospital of Phila.	123	1	124
University of Chicago, The School of Medicine of the				Jefferson Medical College of Philadelphia.....	142	3	145
Division of Biological Sciences.....	36	2	38	Temple University School of Medicine.....	103	2	105
University of Illinois College of Medicine.....	130	2	132	University of Pennsylvania School of Medicine.....	131	7	138
INDIANA				University of Pittsburgh School of Medicine.....	60	..	60
Indiana University School of Medicine.....	86	..	86	Woman's Medical College of Pennsylvania.....	24	3	27
IOWA				SOUTH CAROLINA			
State University of Iowa College of Medicine.....	90	..	90	Medical College of the State of South Carolina....	41	1	42
KANSAS				TENNESSEE			
University of Kansas School of Medicine.....	67	1	68	Meharry Medical College.....	37	..	37
KENTUCKY				University of Tennessee.....	92	..	92
University of Louisville School of Medicine.....	93	5	100	Vanderbilt University.....	53	2	55
LOUISIANA				TEXAS			
Louisiana State University Medical Center.....	57	..	57	Baylor University College of Medicine.....	80	..	80
Tulane University of Louisiana School of Medicine..	117	2	119	University of Texas School of Medicine.....	78	..	78
MARYLAND				VERMONT			
Johns Hopkins University School of Medicine.....	81	6	87	University of Vermont College of Medicine.....	25	13	38
University of Maryland School of Medicine and Col-				VIRGINIA			
lege of Physicians and Surgeons.....	98	2	100	Medical College of Virginia.....	81	1	82
MASSACHUSETTS				University of Virginia Department of Medicine....	53	..	53
Boston University School of Medicine.....	20	21	41	WISCONSIN			
Harvard Medical School.....	76	55	131	Marquette University School of Medicine.....	57	3	60
Tufts College Medical School.....	61	37	98	University of Wisconsin Medical School.....	45	..	45
MICHIGAN				CANADA			
University of Michigan Medical School.....	93	2	95	Dalhousie University Faculty of Medicine.....	13	2	15
Wayne University College of Medicine.....	79	..	79	Laval University Faculty of Medicine.....	..	..	..
MINNESOTA				McGill University Faculty of Medicine.....	49	9	58
University of Minnesota Medical School.....	121	5	126	Queen's University Faculty of Medicine.....	17	..	17
MISSOURI				University of Alberta Faculty of Medicine.....	2	..	2
St. Louis University School of Medicine.....	104	5	109	University of Manitoba Faculty of Medicine.....	6	..	6
Washington University School of Medicine.....	87	6	93	University of Montreal Faculty of Medicine.....	3	2	5
NEBRASKA				University of Toronto Faculty of Medicine.....	21	3	24
Creighton University School of Medicine.....	63	1	64	University of Western Ontario Medical School.....	6	..	6
University of Nebraska College of Medicine.....	79	2	81	Foreign Medical Faculties.....	638	30	668
				Extinct Medical Faculties.....	1	1	2
				Unapproved Schools and Undergraduates.....	245	37	282
				Totals.....	5,755	497	6,252

greatest numbers from any one school were 152 from the University of Illinois College of Medicine, 146 from Rush Medical College and 145 from Jefferson Medical College. Of the United States schools the Albany Medical College had the fewest, twenty-five, while only two were represented from the University of Alberta Faculty of Medicine. McGill University Faculty of Medicine added fifty-eight of its graduates to the physician population of the United States. From the United States schools there were 4,752 graduates added to the profession by examination and 413 by reciprocity or endorsement of credentials, a total of 5,165. From the Canadian schools 135 were added, by examination

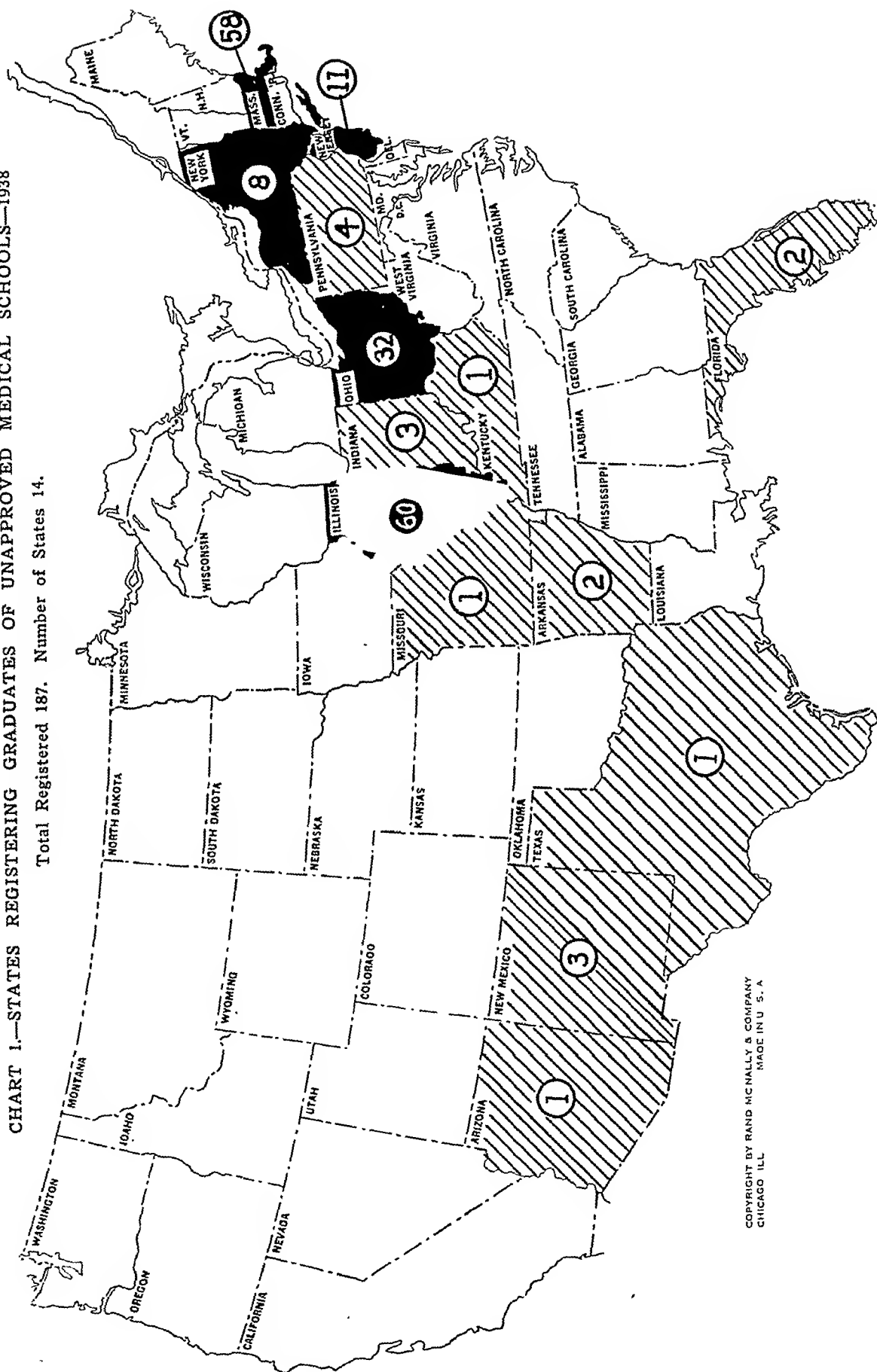
and Hospitals in its Essentials of an Acceptable Medical School has been two years of college work. Six states, however, have not yet revised or amended their statutes to conform with these prerequisites, although with one exception these states do not as a rule license other than graduates of approved schools (table 11).

REQUIRED HOSPITAL INTERNSHIPS

The medical schools and licensing boards requiring or planning to require a hospital internship for state licensure and the M.D. degree, respectively, are shown in tables 12 and 13. The effective date of the requirement is also shown in table 13.

CHART 1.—STATES REGISTERING GRADUATES OF UNAPPROVED MEDICAL SCHOOLS—1938

Total Registered 187. Number of States 14.

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The states in black registered more than 5 such candidates, those shaded 5 or less.

As revealed in table 12, twenty-one states, the District of Columbia, Alaska, and Puerto Rico require that all applicants for licensure possess a hospital internship. The first state exacting this requirement was Pennsylvania in 1914. The requirement in Alabama and

TABLE 11.—State Requirements of Preliminary Training

Two Years of College		
Alabama	Maine	Oregon
Arizona	Maryland	Pennsylvania
Arkansas	Michigan	Rhode Island
Colorado	Minnesota	South Carolina
Delaware	Mississippi	South Dakota
District of Columbia	Montana	Tennessee
Florida	Nevada	Texas
Georgia	New Hampshire	Utah
Idaho	New Jersey	Vermont
Illinois	New Mexico	Virginia
Indiana	New York	Washington
Iowa	North Carolina	West Virginia
Kansas	North Dakota	Wisconsin
Kentucky	Oklahoma	Wyoming
Louisiana		

One Year of College			
California		Connecticut	
High School Graduation or Its Equivalent			
Massachusetts	Missouri	Nebraska	Ohio

TABLE 12.—Internship Required by Medical Licensing Boards of All Candidates *

Alabama	Michigan	Rhode Island
Alaska	New Hampshire	South Dakota
Delaware	New Jersey	Utah
District of Columbia	North Dakota	Vermont
Idaho	Oklahoma	Washington
Illinois	Oregon	West Virginia
Iowa	Pennsylvania	Wisconsin
Louisiana	Puerto Rico	Wyoming

* In addition some states require the internship of graduates of medical faculties abroad and reciprocity or endorsement applicants. See tables 6 and 20.

TABLE 13.—Internship Required by Medical Schools

	Effective Date
University of California Medical School	1919
College of Medical Evangelists	1927
University of Southern California School of Medicine	1933
Stanford University School of Medicine	1919
Loyola University School of Medicine	1922
Northwestern University Medical School	1920
University of Illinois College of Medicine	1922
Louisiana State University Medical Center	1934
Wayne University College of Medicine	1924
University of Minnesota Medical School	1915
Duke University School of Medicine	1932
University of Cincinnati College of Medicine	1926
Marquette University School of Medicine	1920
Canada	
University of Manitoba Faculty of Medicine	
Dalhousie University Faculty of Medicine	
McGill University Faculty of Medicine	
University of Montreal Faculty of Medicine	

* Requires a two year internship

Louisiana became effective in 1939. In addition, other states require the internship of graduates of medical faculties abroad and reciprocity or endorsement applicants. These data are found in tables 6 and 20.

Thirteen schools in the United States and four in Canada exact the internship requisite. A few of the medical schools will accept research or other clinical work in lieu of the internship

CANDIDATES EXAMINED FROM 1934 TO 1938
INCLUSIVE

In table 14 are listed the number of candidates examined in the various states, territories and possessions in the last five years, 1934-1938 inclusive, showing those who passed and failed. In this period New York licensed 4,793 candidates, Pennsylvania 2,511, Illinois 2,240, California 1,751, Ohio 1,557,

Massachusetts 1,214, Michigan 1,143, New Jersey 1,056 and Maryland 1,036. Thirty-one states licensed less than 500 and eleven less than 100. The smallest number (nine) were examined in New Mexico. The percentage of candidates who failed in the examinations in the past five years is given in the last column. The percentage of failures in all states has increased from 8.4 in 1934 to 11.7 in 1938. In the five year period, 47.2 per cent of the applicants failed in Massachusetts. The high percentage in this state is due to the fact that by law the licensing board is required to admit to its examination the graduates of unapproved schools, many of whom repeatedly fail. Connecticut had 21.6 per cent failures in five years and Florida

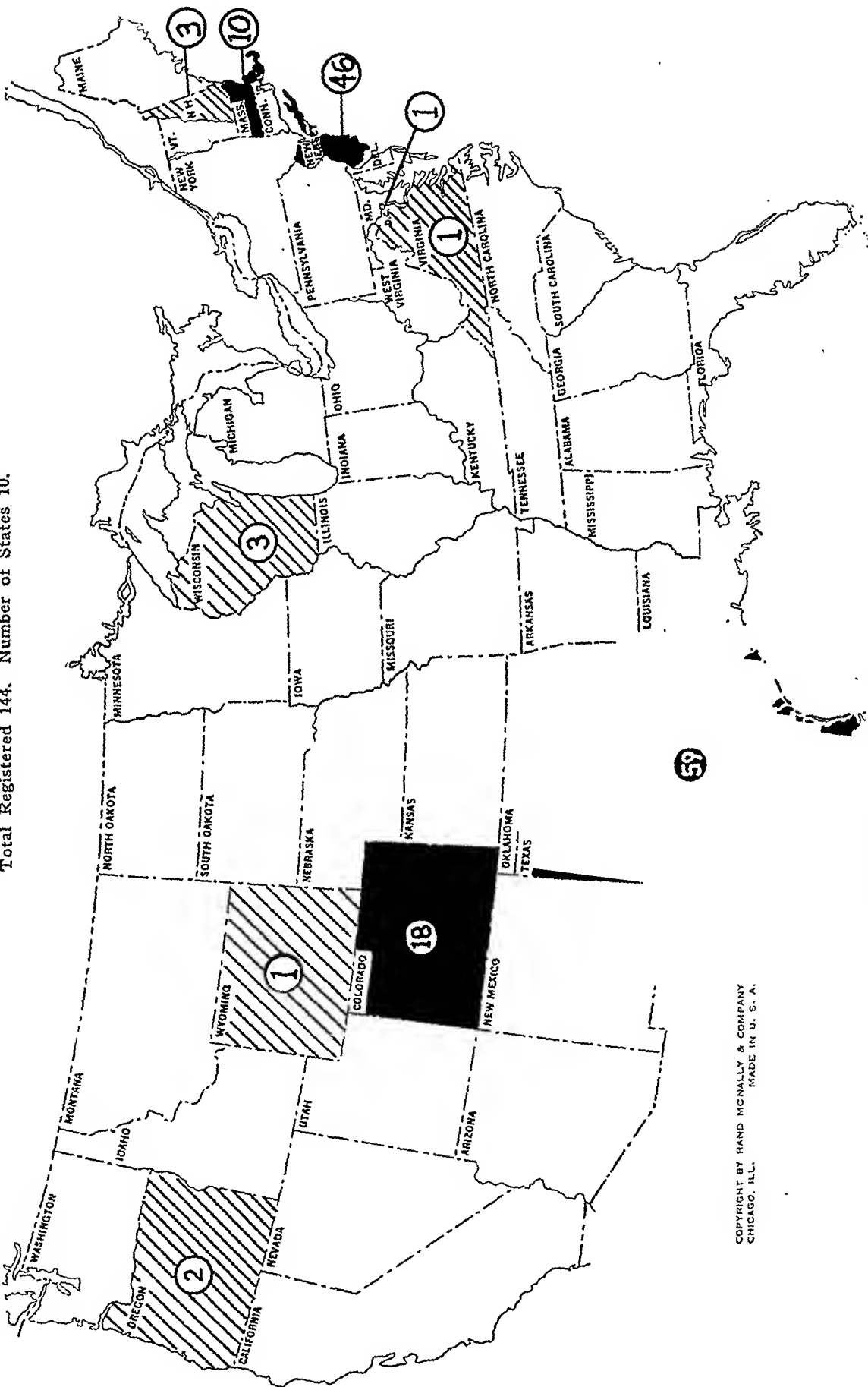
TABLE 14.—Candidates Examined—1934-1938, Inclusive

	1934	1935	1936	1937	1938	Totals for Five Years							
	Passed	Failed	Passed	Failed	Passed	Failed	Percentage Failed						
Alabama	20	0	37	0	26	1	135	5.36					
Arizona	7	2	9	2	14	3	70	15.71					
Arkansas	53	0	42	0	48	0	261	0.00					
California	303	16	328	14	369	18	349	20	402	15	1,751	8.54	
Colorado	66	2	59	1	79	1	78	3	3-8	10	27		
Connecticut	70	12	68	13	76	30	80	21	73	24	362	100	21.6
Delaware	14	7	13	5	17	0	14	2	14	0	72	14	16.3
Dist. Columbia	50	1	43	1	32	1	41	0	33	0	160	3	1.5
Florida	105	27	135	24	154	44	164	38	153	41	711	174	10.7
Georgia	80	0	88	2	89	0	83	0	72	0	412	2	0.7
Idaho	13	0	7	1	13	0	20	0	28	0	81	1	1.2
Illinois	368	13	423	10	471	6	488	5	490	12	2,240	46	2.0
Indiana	143	4	115	4	118	0	123	2	108	1	607	11	1.5
Iowa	100	0	77	1	103	0	88	0	95	11	463	12	2.5
Kansas	98	0	95	0	96	0	82	0	93	1	464	1	0.2
Kentucky	80	2	81	0	84	0	81	1	61	1	407	4	1.0
Louisiana	122	0	134	0	133	1	173	1	184	2	740	4	0.5
Maine	35	0	45	1	53	0	58	2	89	7	230	10	4.2
Maryland	204	17	194	28	202	34	209	27	227	38	1,036	144	12.2
Massachusetts	236	170	199	239	271	239	301	210	207	220	1,214	1,087	47.2
Michigan	225	2	244	1	238	0	211	1	225	1	1,143	3	0.4
Minnesota	139	0	173	0	191	1	219	0	210	2	961	3	0.3
Mississippi	28	1	30	1	22	4	22	2	31	1	133	9	6.1
Missouri	186	2	214	8	202	3	168	12	174	3	904	28	2.9
Montana	9	0	8	0	15	0	4	1	11	0	47	1	2.1
Nebraska	86	0	90	0	75	0	79	0	85	0	415	0	0.0
Nevada	5	0	3	1	0	0	5	0	5	0	18	1	5.3
New Hampshire	6	0	4	0	24	0	17	0	16	0	67	0	0.0
New Jersey	175	10	182	5	168	6	250	33	281	51	1,056	107	9.2
New Mexico	1	0	1	0	3	0	2	0	2	0	9	0	0.0
New York	834	193	879	195	932	249	1,070	291	1,078	372	4,793	1,300	21.3
North Carolina	75	0	65	0	64	0	83	0	85	0	372	0	0.0
North Dakota	12	1	14	1	14	0	13	0	13	2	68	4	7.6
Ohio	261	6	295	3	312	2	347	5	342	11	1,531	27	1.7
Oklahoma	73	0	62	0	70	0	49	0	46	0	300	0	0.0
Oregon	28	0	35	0	48	0	38	0	51	0	242	0	0.0
Pennsylvania	406	10	404	6	341	1	328	4	312	9	2,511	30	1.2
Rhode Island	34	3	38	4	22	7	38	7	26	1	173	22	11.1
South Carolina	46	0	49	0	32	0	46	1	39	1	212	2	0.9
South Dakota	10	0	20	0	15	0	17	2	8	0	70	2	2.8
Tennessee	173	0	181	1	178	1	207	1	179	3	918	6	0.7
Texas	165	2	188	4	178	19	181	19	200	26	912	70	7.1
Utah	20	0	20	1	23	0	10	0	12	0	85	1	1.2
Vermont	30	0	26	0	38	0	26	0	26	1	146	1	0.7
Virginia	132	4	199	1	110	0	150	2	127	0	638	7	1.1
Washington	47	0	44	0	58	1	57	0	72	0	276	1	0.4
West Virginia	25	0	33	0	39	0	60	1	65	1	247	2	0.8
Wisconsin	118	4	111	0	111	1	118	0	114	0	572	7	0.9
Wyoming	1	1	3	0	1	0	2	1	7	0	14	2	12.5
U. S. Terr. and Possessions	29	4	40	6	21	12	39	4	54	9	167	35	17.7
Total examined	6,140		6,485		6,914		7,325		7,454		34,265		
Passed	5,624		5,851		6,230		6,504		6,582		30,771		
Failed	516		584		694		731		872		3,494		
Percentage failed	8.4		9.1		10.0		10.0		11.7		9.9		

19.7 per cent. The third highest proportion of failures was in New York with 21.3 per cent. The comparatively high percentage in this state is occasioned by the fact that New York admits a great many graduates of foreign medical schools to its licensing examination. Florida has no reciprocal relations with any state, all candidates applying being required to take the licensing examination. Graduates of earlier years experience difficulty in passing examinations. On the other hand, Arkansas, Nebraska, New Hampshire, New Mexico, North Carolina, Oklahoma and Oregon—seven states

CHART 2.—MEDICAL LICENSING BOARDS REGISTERING OSTEOPATHS TO PRACTICE MEDICINE, SURGERY OR BOTH—1938

Total Registered 144. Number of States 10.



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The states in black registered more than 5 such candidates, those shaded 5 or less.

—had no failures Alabama, California, Colorado, the District of Columbia, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Michigan, Minnesota, Missouri, Montana, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia and Wisconsin—twenty-eight states—had less than 5 per cent of failures A total of 34,268 candidates were examined in the five years from 1934 to 1938 inclusive, of whom 30,871 passed and 3,397 failed, 9.9 per cent. These figures represent examinations given and not individuals A candidate who fails more than once in a given year is counted as only one failure, but should he fail in one of the succeeding years in another state he is counted in that year also Likewise, if a candidate fails and later passes, whether in the same or a later year, he is counted as failed and passed With a total of 3,397 failures for the five year period, it seems likely that there were approximately 30,000 individuals

TABLE 15—Registration—1904-1938

Year	All Candidates Examined			Registered Without Written Examination	Total Registered
	Examined	Passed	Percentage Failed		
1904	7,005	5,692	19.3	1,004	6,696
1905	7,178	5,658	20.8	394	6,052
1906	8,038	6,371	20.7	1,002	7,373
1907	7,278	5,730	21.3	1,427	7,157
1908	7,775	6,059	21.7	1,254	7,373
1909	7,235	5,860	19.6	1,381	7,246
1910	7,009	5,717	18.4	1,640	7,307
1911	6,964	5,382	19.8	1,243	6,853
1912	6,850	5,467	20.5	1,272	6,783
1913	6,402	5,202	18.0	1,292	6,544
1914	5,579	4,379	21.5	1,189	5,818
1915	5,334	4,507	15.3	1,399	5,906
1916	4,810	4,149	14.9	1,303	5,002
1917	4,753	4,084	14.1	1,369	5,444
1918	3,666	3,183	13.2	1,047	4,230
1919	4,700	4,074	14.2	2,500	6,610
1920	4,795	4,061	15.3	2,508	6,619
1921	4,824	4,227	12.4	2,155	6,442
1922	4,031	3,539	12.2	2,073	5,612
1923	4,726	4,027	14.8	2,403	6,430
1924	5,293	4,704	11.8	1,918	6,672
1925	5,099	5,447	9.2	1,860	7,307
1926	5,766	5,310	7.9	1,911	7,261
1927	5,382	4,990	7.2	2,174	7,169
1928	5,452	5,084	6.8	2,227	7,311
1929	5,627	5,280	6.2	2,419	7,699
1930	5,563	5,247	5.7	2,366	7,613
1931	5,608	5,260	6.2	2,212	7,472
1932	5,666	5,238	7.6	1,854	7,122
1933	5,670	5,241	7.6	1,989	7,230
1934	6,140	5,624	8.4	2,160	7,784
1935	6,435	5,801	9.1	2,195	8,046
1936	6,914	6,220	10.0	2,764	8,984
1937	7,325	6,594	10.0	3,186	9,780
1938	7,404	6,082	11.7	2,945	9,527

examined. It is to be assumed that the majority of those who fail are later reexamined and licensed in some state This figure gives a fair estimate of the number of physicians added to the profession each year. On page 1710 will be found exact totals for several years

REGISTRATION 1904-1938

A study of totals and percentages for thirty-five years (1904-1938) is presented in table 15 The number (6,582) who passed in 1938 was twelve less than in 1937 but 362 more than in 1936 and 890 more than in 1904 The number registered without examination, 2,945, was 241 less than in 1937 However, contrasting these figures with those for 1904 will show the great use being made of this system of licensure By both methods, examination and endorsement of credentials, 9,527 were registered, 253 less than in 1937. The number registered in 1937, 9,780, represented the largest number of candidates registered in thirty-five years Of those examined in 1938, 11.7 per cent failed as compared with 21.7 per cent in 1908 The failures in recent years represent to a large extent graduates of unap-

proved schools and foreign faculties. They are responsible also for the increase in the percentage of failures in 1938 as compared with the last four or five years.

While these figures represent those registered in the years given, they do not in all states represent the number licensed in a given year. Licenses are withheld in many states, as indicated in the text describing table 1.

TABLE 16—Graduates of Approved Schools and Others Registered 1922-1938

Year	Graduates of Approved Schools		Others		Totals
	Number	Per Cent	Number	Per Cent	
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,234	19.2	6,430
1924	5,685	85.2	987	14.8	6,672
1925	6,313	86.4	994	13.6	7,307
1926	6,438	88.7	823	11.3	7,261
1927	6,410	89.4	759	10.6	7,169
1928	6,584	90.1	727	9.9	7,311
1929	7,002	91.0	697	9.0	7,699
1930	7,011	92.1	602	7.9	7,613
1931	6,931	92.8	541	7.2	7,472
1932	6,675	93.7	447	6.3	7,122
1933	6,774	93.7	456	6.3	7,230
1934	7,170	92.1	614	7.9	7,784
1935	7,362	91.5	684	8.5	8,046
1936	7,922	88.2	1,062	11.8	8,984
1937	8,371	85.6	1,409	14.4	9,780
1938	8,300	87.1	1,227	12.9	9,527

There appears to be no marked increase or decrease in the total number of candidates registered from 1904 to 1933, but from 1934 to 1937 the number registered has been markedly increasing although there was a decrease in 1938 of 253 as compared with 1937. However, the number licensed without examination since 1906 has been increasing, owing to the almost universal recognition of the certificate of the National Board of Medical Examiners The decrease in the number registered in 1918 was due to the sudden withdrawal of physicians and recent graduates from civilian life Again in 1922 there was a notable reduction, this figure resulting from the small number that began the study of medicine in 1918

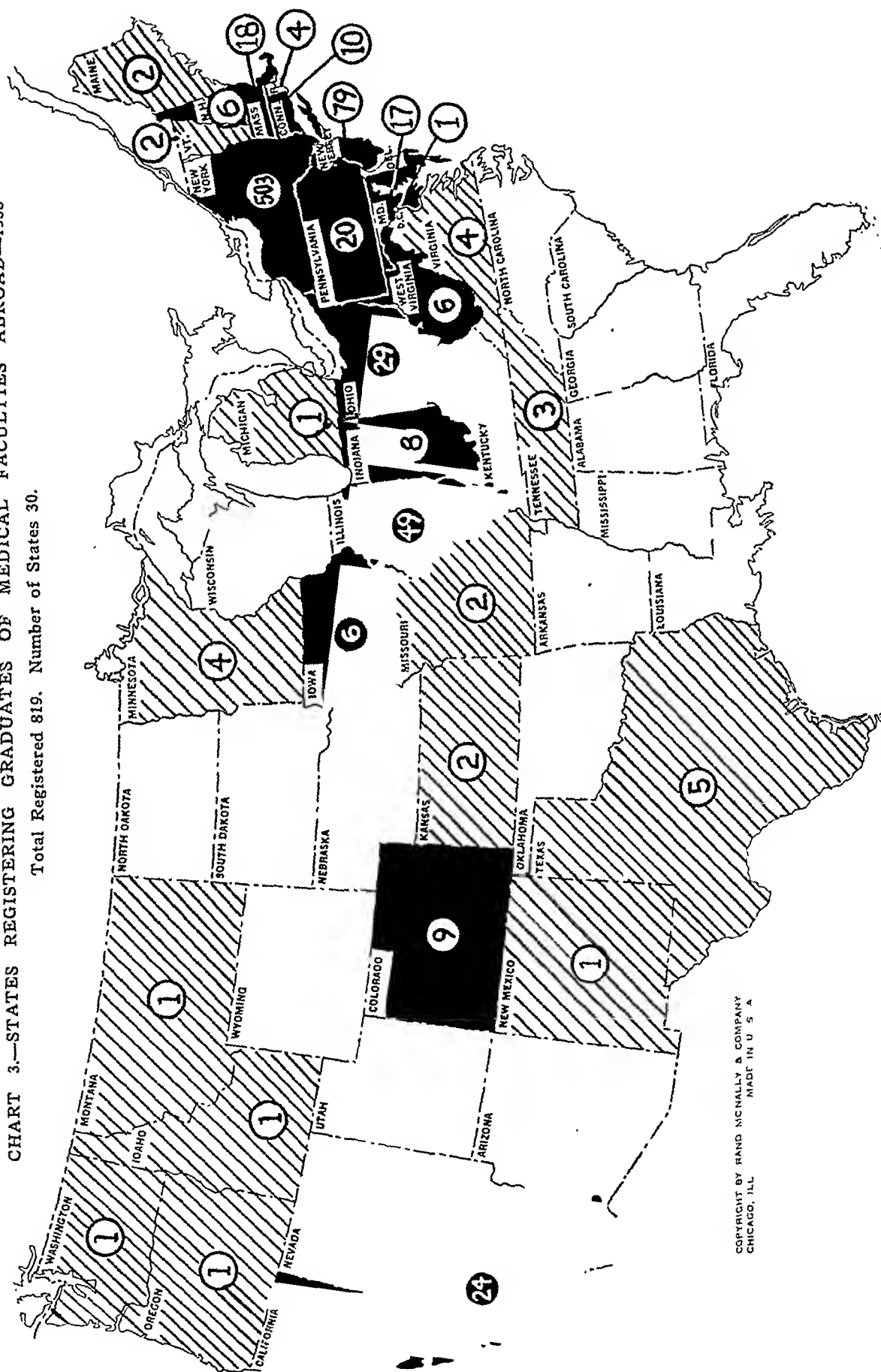
TABLE 17—Graduates of Unapproved Medical Schools Registered—1934-1938

	Examination					Reciprocity and Endorsement					Total
	1934	1935	1936	1937	1938	1934	1935	1936	1937	1938	
Arizona	0	0	0	2	1	0	0	0	0	1	3
Arkansas	1	0	0	0	1	0	0	0	0	0	2
California	1	1	0	0	0	0	2	0	0	0	4
Florida	1	1	1	2	2	0	0	0	0	0	7
Idaho	0	0	0	0	0	1	0	0	0	0	1
Illinois	33	67	54	52	60	0	0	0	0	0	206
Indiana	0	1	0	0	0	0	0	0	0	3	4
Kansas	1	0	0	0	0	0	0	0	0	0	1
Kentucky	1	1	0	0	0	0	0	2	2	1	7
Massachusetts	54	26	77	96	58	0	0	0	0	0	311
Mississippi	1	0	0	0	0	1	0	0	0	0	2
Missouri	0	0	0	0	0	0	2	0	0	1	3
Nebraska	0	0	0	0	0	0	0	0	1	0	1
New Jersey	0	0	5	1	7	4	0	1	2	4	24
New Mexico	0	0	1	0	1	0	2	1	0	2	7
New York	0	0	0	0	0	0	0	13	14	8	35
North Carolina	0	0	1	2	0	0	0	0	0	0	3
North Dakota	0	0	0	0	0	0	1	0	0	0	1
Ohio	0	10	31	23	32	1	0	0	0	0	101
Oklahoma	0	1	0	0	0	0	0	0	0	0	1
Pennsylvania	0	0	0	1	4	0	0	0	0	0	5
Rhode Island	0	1	0	0	0	0	0	0	0	0	1
South Dakota	0	1	0	0	0	0	0	0	0	0	1
Texas	0	0	0	0	1	2	0	0	3	0	6
Virginia	0	0	0	1	0	0	0	0	0	0	1
Wisconsin	0	0	0	0	0	0	1	0	0	1	2
Alaska and Hawaii	1	0	1	1	0	0	0	1	0	0	4
Totals	94	116	231	211	167	9	7	19	22	20	599

There was a decrease of twelve in the number registered by examination in 1938 and a larger decrease in the number registered by reciprocity or endorsement The graduating class of 1938 of medical schools in the United States was 183 fewer than that for 1937, which

CHART 3.—STATES REGISTERING GRADUATES OF MEDICAL FACULTIES ABROAD—1938

Total Registered 819. Number of States 30.

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The states in black registered more than 5 such candidates, those shaded 5 or less.

was 5,377 and may account for the decrease. It may also be due to the fact that several of the states are proceeding with more caution in the licensure of graduates of foreign credentials exacting additional requirements, such as an internship or further training in a medical school in the United States, in order to test their fitness for the practice of medicine in this country. It was also anticipated that the number of those registered to practice medicine and surgery would decrease,

Medical Education and Hospitals since 1907 are classified as approved. In the column "Others" are included graduates of institutions prior to 1907 of foreign faculties of medicine, class C graduates, undergraduates, osteopaths and graduates of schools that have been refused all recognition as medical schools.

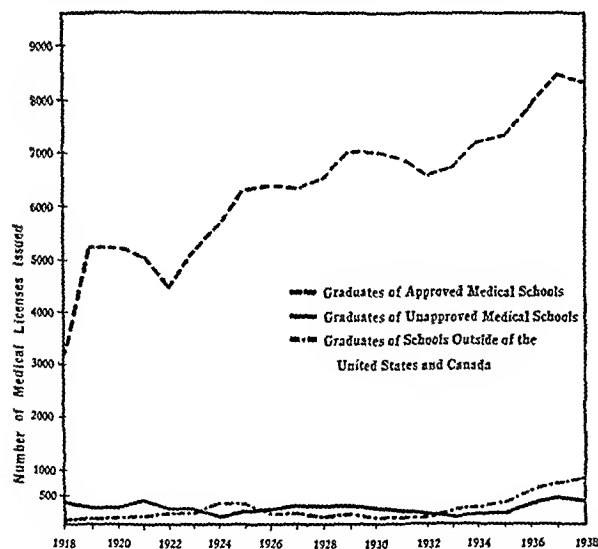
Of the 9,527 graduates registered in 1938, 6,582 were registered after examination and 2,945 by endorsement. There were 5,446 graduates of approved medical schools in the United States, 148 graduates of approved Canadian medical schools registered and 988 others. Likewise among those registered by endorsement there were 2,668 graduates of approved medical schools in the United States and forty-six graduates of approved medical schools in Canada and 231 others.

TABLE 18—*Graduates of Schools of Osteopathy Registered by Medical Examining Boards—1934-1938*

	Examination					Reciprocity and Endorsement					Total
	1934	1935	1936	1937	1938	1934	1935	1936	1937	1938	
Colorado.....	10	13	16	19	18	0	0	0	0	0	76
Connecticut.....	1	0	1	1	0	0	0	0	0	0	3
Dist. of Columbia..	0	0	0	0	1	1	0	0	0	0	2
Massachusetts.....	21	5	12	18	10	0	0	0	0	0	66
New Hampshire.....	0	0	1	4	2	0	0	0	2	1	10
New Jersey.....	0	2	0	52	46	0	0	0	0	0	100
Oregon.....	0	0	1	1	1	0	0	2	0	1	6
Texas.....	7	7	11	17	22	17	13	34	72	37	237
Virginia.....	2	4	4	2	1	0	1	0	0	0	14
Wisconsin.....	2	0	3	1	0	3	0	5	2	3	19
Wyoming.....	0	0	0	0	0	1	2	4	4	1	12
Totals.....	43	31	49	115	101	22	16	45	80	43	545

as there has been a reduction in medical school enrollments in recent years. In seventy-seven schools in the United States there were 22,888 students enrolled in 1935, 22,564 in 1936, 22,095 in 1937 and 21,587 in 1938. Classes in subsequent years in many cases will be further reduced.

The percentage of failures in 1938 was 11.7, the highest percentage since 1924, when 11.8 per cent failed. This increase is largely the result of the failure of many



Medical licensure in the United States, 1918-1938. The number of medical licenses issued includes duplicate registration.

of the graduates of unapproved schools and osteopaths granted medical privileges to pass the test on the first try. This is further outlined in subsequent tables.

SOURCE OF PHYSICIANS REGISTERED

The educational fitness of the individuals registered in seventeen years, 1922-1938, is shown in table 16. Of the 9,527 registered by all methods in 1938, 8,300, or 87.1 per cent, graduated from approved medical schools and there were 1,227, 12.9 per cent, other practitioners registered. In the computation of these figures, all schools rated as class A and B by the Council on

LICENSURE OF PHYSICIANS 1918-1938

In graphic form are here presented data regarding the licensure of physicians in twenty-one years. Three significant curves are shown; namely, graduates of approved medical schools, graduates of unapproved medical schools and graduates of foreign medical faculties. The number of approved graduates in the period shown has always been in the bracket above 3,000, while in the other groups it has until recent years been below 500. The number of unapproved graduates is gradually decreasing, although the number licensed with foreign credentials is increasing.

GRADUATES OF UNAPPROVED MEDICAL SCHOOLS REGISTERED

In table 17 will be noted the total number of graduates of those institutions which do not meet the standards for approval outlined by the House of Delegates of the American Medical Association who were registered with or without examination from 1934 to 1938.

Fourteen states registered 187 such graduates in 1938, 167 by examination and twenty without examination. The number decreased by forty-six the number registered in 1937. One each was licensed in Arizona, Kentucky, Missouri and Texas. One undergraduate was licensed in 1938 in New Jersey.

In the five year period shown, 866 graduates of unapproved schools and undergraduates were registered, 789 by examination and seventy-seven by reciprocity.

Chart 1, on page 1712, indicates by shaded lines those registering fewer than six graduates of unapproved medical schools and by a solid area those registering more than five such candidates during 1938.

MEDICAL EXAMINING BOARDS REGISTERING OSTEOPATHS TO PRACTICE MEDICINE, SURGERY OR BOTH

In table 18 are given the number of graduates of schools of osteopathy registered with or without examination by medical examining boards from 1934 to 1938 inclusive.

In 1938 ten states registered such individuals, 101 by examination and forty-three by endorsement of credentials. These osteopaths were registered in Colorado, the District of Columbia, Massachusetts, New Hampshire, New Jersey, Oregon, Texas, Virginia, Wisconsin and Wyoming and were granted the right to practice medicine, surgery or both by the board of medical examiners. These facts for 1938 are shown graphically in chart 2, on page 1714.

In the five year period 1934-1938, 545 graduates of osteopathic schools were registered in eleven states.

In Colorado osteopaths are admitted to the examination for a license to practice medicine. They have no

(CONTINUED ON PAGE 1720)

TABLE 19.—Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada—1938

Marginal Number	California	Colorado	Connecticut	Idaho	Illinois	Indiana	Iowa	Kansas	Maine	Maryland	Massachusetts	Michigan	Minnesota	Missouri	New Hampshire	New Jersey	New York	Ohio	Oregon	Pennsylvania	Rhode Island	Tennessee	Texas	Virginia	Washington	West Virginia	Hawaii, Puerto Rico
1	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
2	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
13	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
18	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
25	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
26	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
27	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
29	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
32	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
33	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
34	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
35	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
36	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
37	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
38	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
39	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
40	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
41	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
42	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
43	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
44	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
45	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
46	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
47	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
48	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
49	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
50	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
51	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
53	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
54	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
55	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
56	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
57	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
58	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
59	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
60	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
61	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
62	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
63	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
64	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
65	1	2	3	4	5	6	7	8	9	10	11	12															

44	National University of Athens.....	0 1.....	0 1.....	0 2 0 1.....	5 0 5 100.0 4 44
GREECE					
HUNGARY					
45	Magyar Királyi Erzsébet Tudományegyetem, Pécs.....	1 0 1 1.....	1 0 1 1.....	3 2 1 33.2 2 45	
46	Magyar Királyi Ferenc József Tudományegyetem, Szeged.....	1 2.....	1 2.....	3 1 2 66.7 1 46	
47	Magyar Királyi Eötvös Péter Tudományegyetem, Budapest.....	1 0 1.....	1 2.....	7 4 3 42.9 5 47	
IRELAND					
48	Licentiate of the Royal College of Physicians of Ireland and Licentiate of the Royal College of Surgeons in Ireland.....	0 1.....	0 1.....	1 0 1 100.0 1 48	
49	National University of Ireland.....	1 1.....	1 1.....	2 1 1 50.0 1 49	
50	University of Dublin.....	1 1.....	1 1.....	2 1 1 50.0 1 50	
ITALY					
51	Regia Università di Bologna.....	1 1.....	2 5.....	26 12 14 53.8 4 51	
52	Regia Università di Catania.....	1 0.....	1 0.....	2 1 1 50.0 2 52	
53	Regia Università di Firenze.....	1 0.....	1 0.....	0 5 1 16.7 3 53	
54	Regia Università di Genova.....	0 1.....	0 1.....	2 0 2 100.0 2 54	
55	Regia Università di Messina.....	0 1.....	0 1.....	2 0 2 100.0 2 55	
56	Regia Università di Milano.....	0 1.....	0 1.....	2 0 2 100.0 2 56	
57	Regia Università di Modena.....	1 1 1.....	1 1 1.....	4 1 2 50.0 2 57	
58	Regia Università di Napoli.....	1 5 2.....	1 5 2.....	4 1 2 50.0 2 58	
59	Regia Università di Padova.....	0 1.....	0 1.....	4 1 2 50.0 2 59	
60	Regia Università di Palermo.....	1 1.....	1 1.....	4 1 2 50.0 2 60	
61	Regia Università di Pavia.....	1 1 5.....	1 1 5.....	11 6 5 45.5 3 61	
62	Regia Università di Pisa.....	1 1 2.....	1 1 2.....	57 29 28 49.1 10 62	
63	Regia Università di Roma.....	1 1.....	1 2.....	4 1 2 50.0 2 63	
64	Regia Università di Siena.....	1 1.....	1 2.....	4 1 2 50.0 2 64	
JAPAN					
65	Japann Medical College, Tokyo.....	0 1.....	0 1.....	1 0 1 100.0 1 65	
LATVIA					
66	Latvijas Universitāte, Riga.....	1 0.....	1 0.....	1 0 1 100.0 1 66	
LEBANON					
67	American University of Beirut.....	2 0.....	2 0.....	2 2 0 0.0 1 67	
MEXICO					
68	Escuela Libre de Homocopatín del Estado de Puebla.....	0 1.....	0 1.....	1 0 1 100.0 1 68	
69	Escuela Médico Militar, México, D. F.....	0 1.....	0 1.....	1 0 1 100.0 1 69	
NETHERLANDS					
70	Rijks-Universiteit te Utrecht.....	1 0.....	1 0.....	1 1 0 0.0 1 70	
POLAND					
71	Uniwersytet Józefa Piłsudskiego, Warszawa.....	0 1 0.....	0 1 0.....	2 1 1 50.0 2 71	
SCOTLAND					
72	Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow.....	1 0.....	1 0.....	61 49 12 19.7 5 72	
73	University of Edinburgh.....	1 0.....	1 0.....	4 4 0 0.0 4 73	
74	University of Glasgow.....	1 0.....	1 0.....	7 7 0 0.0 3 74	
75	University of St. Andrews.....	1 0.....	1 0.....	4 3 1 25.0 2 75	
SWITZERLAND					
76	Universität Basel.....	1 0.....	1 0.....	40 30 10 25.0 5 76	
77	Universität Bern.....	1 0.....	1 0.....	58 39 19 32.8 6 77	
78	Universität Zürich.....	1 0.....	1 0.....	93 18 10 35.7 3 78	
79	Université de Genève.....	1 0.....	1 0.....	21 12 9 42.9 7 79	
80	Université de Lausanne.....	1 0.....	1 0.....	25 17 8 32.0 6 80	
TURKEY					
81	University of Istanbul.....	0 1.....	0 1.....	1 0 1 100.0 1 81	
UNION OF SOVIET REPUBLICS					
82	Kiev Medical Institute.....	0 1.....	0 1.....	1 0 1 100.0 1 82	
83	Totals.....	22 9 35 1 55 7 4 1 9 50 35 1 4 2 2 106 730 37 1 24 3 3 8 4 1 6 16 1,106	83		
84	Total—Examined—Passed.....	19 9 9 1 48 6 4 1 2 16 17 0 4 2 2 66 433 37 1 20 3 2 3 4 1 6 10	84		
85	Total—Examined—Failed.....	3 0 16 0 7 1 0 0 7 34 18 1 0 0 0 40 297 10 0 4 0 1 5 0 0 0 6	85		
86	Percentage—Failed.....	15.6 0.0 64.0 0.0 12.7 14.3 0.0 0.0 77.8 68.0 51.4 100.0 0.0 0.0 37.7 40.7 27.0 0.0 16.7 0.0 33.3 62.5 0.0 0.0 37.5	86		

P = Passed, F = Failed.

(CONTINUED FROM PAGE 1717)

separate board. The statute of Colorado is silent with respect to the scope of practice authorized by a license issued to osteopaths.

TABLE 20.—Requirements of Candidates for Medical Licensure on the Basis of Credentials Obtained in Countries Other Than the United States and Canada

	Admitted by Examination	Admitted by Endorsement of State License	Citizenship	Basic Science Certificate	Internship	Further Medical Training	Examination Fee, Dollars	Other Requirements
Alabama	+	Not accepted	+	..	-	..	10	1
Arkansas (regular board)...	+	..	+	25	..
California...	+	..	1st P	+	+	+	25	..
Colorado...	+	..	1st P	+	+	+	25	..
Connecticut (regular board)	+	+	..	+	+	+	25	..
Delaware (regular board)...	+	+	..	+	+	+	25	..
District of Columbia	+	+	..	+	+	+	25	..
Florida	+	+	..	+	+	+	25	..
Georgia...	+	+	..	+	+	+	25	..
Idaho	+	+	..	+	+	+	25	..
Illinois...	+	+	..	+	+	+	10	..
Indiana...	+	+	..	+	+	+	25	..
Iowa	+	+	..	+	+	+	25	..
Kansas...	+	+	..	+	+	+	25	..
Kentucky	+	+	..	+	+	+	25	..
Louisiana	+	+	..	+	+	+	25	..
Maine	+	+	..	+	+	+	25	..
Maryland (regular board)	+	+	..	+	+	+	25	..
Massachusetts	+	+	..	+	+	+	25	..
Mississippi	+	+	..	+	+	+	25	..
Missouri	+	+	..	+	+	+	25	..
Montana	+	+	..	+	+	+	25	..
Nebraska	+	+	..	+	+	+	25	..
Nevada	+	+	..	+	+	+	25	..
New Hampshire	+	+	..	+	+	+	25	..
New Mexico	+	+	..	+	+	+	25	..
New York	+	+	..	+	+	+	25	..
North Carolina	+	+	..	+	+	+	25	..
North Dakota	+	+	..	+	+	+	25	..
Ohio	+	+	..	+	+	+	25	..
Oklahoma	+	+	..	+	+	+	25	..
Oregon	+	+	..	+	+	+	25	..
Pennsylvania	+	+	..	+	+	+	25	..
Rhode Island	+	+	..	+	+	+	25	..
South Carolina	+	+	..	+	+	+	25	..
South Dakota	+	+	..	+	+	+	25	..
Tennessee	+	+	..	+	+	+	25	..
Texas	+	+	..	+	+	+	25	..
Utah	+	+	..	+	+	+	25	..
Vermont	+	+	..	+	+	+	25	..
Wisconsin	+	+	..	+	+	+	25	..
Wyoming	+	+	..	+	+	+	25	..

Compilation of data furnished by state examining boards. This information is not guaranteed as there may have been changes of which this office has not been advised. For an authentic statement write directly to the medical board.

* Refer to chart of "Reciprocity and Endorsement Policies" for further data.

Reports from Arizona and New Jersey were not received.

1. Certificate of National Board of Medical Examiners and licensure in country in which school of graduation is located.

2. Internship or one year in medical school in United States.

3. Certificate of National Board of Medical Examiners.

4. For graduates of last five years; if more than five years \$50.

5. Residence of one year in Delaware.

6. Provided similar privileges are accorded licentiates of District of Columbia by licensing agency of the jurisdiction from which the applicant comes.

7. Senior year in Class A medical school in United States.

8. Effective in May 1939.

9. Reciprocity applicants only.

10. Application must be filed six months prior to date of examination.

11. Licensed to practice medicine and surgery in country in which school of graduation is located.

12. Diplomates of National Board of Medical Examiners eligible for licensure only.

13. At the discretion of the board.

14. Internship and one year graduate work.

15. After July 1, 1939.

16. Applicants from schools in England and Scotland only.

In most states all foreign credentials must be visaed by the American consul.

The Connecticut statute provides that any registered osteopath may practice either medicine, surgery or both, as the case may be, after passing a satisfactory examination before the medical examining board.

The Massachusetts statute, by definition, includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an osteopathic

applicant. The medical practice act requires that any applicant for license to practice must be in possession of a degree of doctor of medicine, or its equivalent, from a legally chartered medical school that gives a full four year course of instruction of not less than thirty-two weeks in each year.

In New Hampshire osteopaths are granted the right to practice medicine and surgery by the Board of Registration in Medicine.

Osteopaths who are duly registered and licensed to practice osteopathy in the state of New Jersey, who present three years of practice of surgery in a hospital approved by the Board of Medical Examiners, may be admitted to the examination to be licensed to practice medicine and surgery.

The statutes of Texas provide for the issuing of a license to practice medicine only. So far as the statutes indicate, the osteopaths are not restricted in their field of practice.

In the District of Columbia, Oregon, Virginia, Wisconsin and Wyoming, osteopaths are granted the right to practice surgery.

TABLE 21.—Annual Registration

Arkansas (Eclectic Board only)	Minnesota
California	Nebraska
Colorado	Nevada
Connecticut	New York
Florida	North Dakota
Georgia	Oregon
Idaho	Pennsylvania
Iowa	Texas
Kansas	Utah
Louisiana	Wyoming

Four states—Alabama, Delaware, Mississippi and North Carolina—require physicians to pay annually an occupational or commercial tax. The fee for this registration is generally \$2.

ANNUAL REGISTRATION

Twenty states, as shown in table 21, require that all physicians licensed register annually, whether or not they reside in the state.

PHYSICIANS EXAMINED ON THE BASIS OF CREDENTIALS OBTAINED IN COUNTRIES OTHER THAN UNITED STATES AND CANADA

An inquiry into the number of citizens of the United States studying medicine in faculties of medicine abroad has been carried on by the Council on Medical Education and Hospitals since 1931, when it became evident that great numbers were going to Europe to pursue medical courses. During the academic year 1937-1938, 1,346 citizens of the United States were enrolled in faculties of medicine abroad and 318 completed the medical course and have it is presumed returned to the United States to practice medicine. Similar figures obtain for other years. This influx of graduates from foreign medical schools has been a problem of major importance in the last few years from the point of view of hospital training, licensure and subsequent adjustment in the field of medical practice and is being further complicated by the migration to this country of physicians from central Europe.

Data recently received from state boards of medical licensure pertaining to the requirements of candidates for medical licensure holding credentials from medical schools outside the United States and Canada are presented in table 20. Reports were received from forty-six states and the District of Columbia. Eleven states report that, because of the inability to evaluate foreign credentials, holders of such certificates are not eligible for licensure. Of the remaining thirty-five states, twenty-nine require either United States citizenship

TABLE 22.—Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada by Licensing Boards of the United States and Possessions, 1933-1938

	1933-1937		1938			1933-1937		1938	
	Number Examined	Percentage Failed	Number Examined	Percentage Failed		Number Examined	Percentage Failed	Number Examined	Percentage Failed
AUSTRALIA					IRAN (PERSIA)				
University of Adelaide.....	1	0.0	0	0.0	Government Medical School, Teheran.....	1	100.0	0	0.0
University of Sydney.....	1	0.0	0	0.0	IRELAND				
AUSTRIA					Licentiate of the Royal College of Physicians of Ireland and Licentiate of the Royal College of Surgeons in Ireland.....	3	0.0	1	100.0
Karl-Franzens-Universität, Graz.....	21	33.1	5	40.0	National University of Ireland.....	6	16.7	50.0	
Leopold-Franzens-Universität, Innsbruck.....	7	28.6	3	33.3	University of Dublin.....	11	27.3	50.0	
Universität Wien.....	200	27.5	123	28.1	ITALY				
BELGIUM					Regia Università di "Benito Mussolini" di Bari.....	1	0.0	0	0.0
Université Catholique de Louvain.....	4	50.0	0	0.0	Regia Università di Bologna.....	40	47.5	26	53.8
Université de Liège.....	5	80.0	0	0.0	Regia Università di Catania.....	0	0.0	2	50.0
Université Libre de Bruxelles.....	2	0.0	1	0.0	Regia Università di Firenze.....	6	66.7	6	16.7
Université Gent.....	1	100.0	1	100.0	Regia Università di Genova.....	10	80.0	2	100.0
CHILE					Regia Università di Messina.....	2	100.0	2	100.0
Universidad de Chile, Santiago.....	2	0.0	0	0.0	Regia Università di Milano.....	5	40.0	2	100.0
CHINA					Regia Università di Modena.....	7	85.7	4	50.0
Pennsylvania Medical School, Shanghai.....	2	0.0	3	33.3	Regia Università di Napoli.....	134	61.9	41	61.0
Woman's Christian Medical College, Shanghai.....	0	0.0	1	0.0	Regia Università di Padova.....	20	60.0	4	50.0
CHOSEN (KOREA)					Regia Università di Palermo.....	24	62.5	3	33.3
Severance Union Medical College, Keijo.....	2	100.0	0	0.0	Regia Università di Pavia.....	2	0.0	1	100.0
CUBA					Regia Università di Perugia.....	4	25.0	0	0.0
Universidad de la Habana.....	16	43.8	1	0.0	Regia Università di Pisa.....	2	50.0	11	45.5
CZECHOSLOVAKIA					Regia Università di Roma.....	188	49.5	37	49.1
	15	33.9	12	33.3	Regia Università di Siena.....	4	50.0	4	75.0
	5	80.0	0	0.0	Regia Università di Torino.....	2	0.0	0	0.0
	7	71.4	2	100.0	JAPAN				
	5	60.0	0	0.0	Japan Medical College, Tokyo.....	1	100.0	1	100.0
DOMINICAN REPUBLIC					LATVIA				
Universidad de Santo Domingo.....	1	0.0	0	0.0	Latvijas Universitāte, Riga.....	0	0.0	1	100.0
ENGLAND					LEBANON				
Fellow of the Royal College of Physicians of London.....	1	0.0	0	0.0	American University of Beirut.....	3	0.0	2	0.0
Licentiate in Medicine, Surgery and Midwifery of the Apothecaries' Society of London.....	5	60.0	0	0.0	Université de St. Joseph, Beyrouth.....	3	66.7	0	0.0
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Physicians of London.....	2	50.0	0	0.0	MEXICO				
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Sur- geons of England.....	57	5.8	9	0.0	Escuela Libre de Homeopatía del Estado de Puebla.....	1	100.0	1	100.0
University of Birmingham.....	3	0.0	0	0.0	Escuela Médico Militar, México, D. F.....	4	75.0	1	100.0
University of Bristol.....	1	0.0	1	0.0	Instituto Literario y Científico, San Luis Potosí.....	1	100.0	0	0.0
University of Cambridge.....	1	0.0	0	0.0	Universidad Nacional, México, D. F.....	13	46.2	0	0.0
University of Durham, Newcastle-upon-Tyne.....	8	25.0	0	0.0	NETHERLANDS				
University of Liverpool.....	1	0.0	0	0.0	Rijks-Universiteit te Leiden.....	3	0.0	0	0.0
University of London.....	8	37.5	0	0.0	Rijks-Universiteit te Utrecht.....	0	0.0	1	0.0
University of Oxford.....	1	0.0	0	0.0	Universiteit van Amsterdam.....	1	0.0	0	0.0
University of Sheffield.....	6	16.7	3	0.0	NORWAY				
ESTONIA					Kongelige Frederiks Universitet, Oslo.....	1	0.0	0	0.0
Üniversitè de Tartu.....	1	0.0	1	100.0	POLAND				
FRANCE					Uniwersytet Jana Kazimierza, Lwów.....	4	50.0	0	0.0
Université de Bordeaux.....	2	50.0	0	0.0	Uniwersytet Józefa Piłsudskiego, Warszawa.....	1	0.0	2	50.0
Université de Lyon.....	5	40.0	1	0.0	Uniwersytet Stefana Batorego, Wilno.....	1	0.0	0	0.0
Université de Montpellier.....	5	40.0	1	0.0	PORTUGAL				
Université de Nancy.....	0	0.0	1	100.0	Universidade de Lisboa.....	4	75.0	0	0.0
Université de Paris.....	75	33.3	38	39.5	RUMANIA				
Université de Strasbourg.....	3	0.0	1	0.0	Universitatea din Bucuresti.....	2	50.0	0	0.0
Université de Toulouse.....	5	20.0	1	0.0	Universitatea Regele Ferdinand I-lea din Cluj.....	7	57.1	0	0.0
GERMANY					SCOTLAND				
Albert-Ludwigs-Universität, Freiburg.....	42	33.1	21	23.6	Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow.....	1	0.0	0	0.0
Universität Heidelberg.....	13	53.8	21	33.1	Licentiate of the Royal College of Physicians of Edinburgh.....	1	0.0	0	0.0
Universität Jena.....	3	0.0	4	50.0	Licentiate of Edinburgh.....				
Universität Leipzig.....	9	44.4	9	44.1	Surgeons of Edinburgh.....	8	0.0	0	0.0
Universität Marburg.....	3	33.3	0	0.0	Licentiate of the Royal C of the Roy School of Medicine of the Royal Colleges, Edinburgh.....	125	21.6	61	19.7
Universität München.....	10	60.0	8	75.0	University of Aberdeen.....	1	0.0	0	0.0
Universität Paderborn.....	180	31.7	140	37.0	University of Edinburgh.....	14	14.3	0	0.0
Universität Regensburg.....	1	0.0	11	36.4	University of Glasgow.....	66	16.6	4	0.0
Universität Tübingen.....	47	19.1	11	27.3	University of St. Andrews.....	32	0.0	7	0.0
Universität Würzburg.....	6	0.0	5	60.0	SOUTH AFRICA, UNION OF				
HUNGARY					University of Cape Town.....	1	0.0	0	0.0
Magyar Királyi Erzsébet Tudományegyetem, Pécs.....	39	30.8	23	33.3	SPAIN				
Magyar Királyi Ferencz József Tudományegyetem, Szeged.....	32	40.6	25	48.0	Universidad Central de España, Madrid.....	5	20.0	0	0.0
Magyar Királyi Pázmány Petrus Tudományegyetem, Budapest.....	5	40.0	4	50.0	Universidad de Santiago.....	1	0.0	0	0.0
Magyar Királyi Tisza-István Tudományegyetem, Debrecen.....	62	27.4	56	39.3	Universidad de Sevilla.....	1	0.0	0	0.0
GREECE					SWITZERLAND				
National University of Athens.....	11	72.7	5	100.0	Universität Basel.....	63	27.0	40	25.0
GUATEMALA					Universität Bern.....	127	35.4	58	32.8
Universidad Nacional de Guatemala.....	2	50.0	0	0.0	Universität Zürich.....	66	27.3	28	35.7
HUNGARY					Université de Genève.....	66	27.3	21	42.9
Magyar Királyi Erzsébet Tudományegyetem, Pécs.....	6	50.0	3	33.3	Université de Lausanne.....	46	22.6	25	32.0
Magyar Királyi Ferencz József Tudományegyetem, Szeged.....	4	25.0	3	66.7	TURKEY				
Magyar Királyi Pázmány Petrus Tudományegyetem, Budapest.....	33	30.3	7	42.9	University of Istanbul.....	1	100.0	1	100.0
Magyar Királyi Tisza-István Tudományegyetem, Debrecen.....	2	50.0	0	0.0	UNION OF SOCIALIST SOVIET REPUBLICS				
IRELAND					First Moscow Medical Institute.....	2	50.0	0	0.0
Licentiate of the Royal College of Physicians of Ireland and Licentiate of the Royal College of Surgeons in Ireland.....	3	0.0	1	100.0	Khar'kov Medical Institute.....	4	50.0	0	0.0
National University of Ireland.....	6	16.7	50.0		River Medical Institute.....	3	66.7	1	100.0
University of Dublin.....	11	27.3	50.0		Military Medical Academy, Leningrad.....	1	100.0	0	0.0
ITALY					Psycho.....	1	100.0	0	0.0
Regia Università di "Benito Mussolini" di Bari.....	1	0.0	0	0.0	Saratov ..	4	75.0	0	0.0
Regia Università di Bologna.....	40	47.5	26	53.8	Second ..	1	0.0	0	0.0
Regia Università di Catania.....	0	0.0	2	50.0	Tomsk ..	1	0.0	0	0.0
Regia Università di Firenze.....	6	66.7	6	16.7	YUGOSLAVIA				
Regia Università di Genova.....	10	80.0	2	100.0	Beogradskog Univerziteta.....	2	50.0	0	0.0
Regia Università di Messina.....	2	100.0	2	100.0	Zagrebaskog Univerziteta.....	1	0.0	0	0.0
Regia Università di Milano.....	5	40.0	2	100.0					
Regia Università di Modena.....	7	85.7	4	50.0					
Regia Università di Napoli.....	134	61.9	41	61.0					
Regia Università di Padova.....	20	60.0	4	50.0					
Regia Università di Palermo.....	24	62.5	3	33.3					
Regia Università di Pavia.....	2	0.0	1	100.0					
Regia Università di Perugia.....	4	25.0	0	0.0					
Regia Università di Pisa.....	2	50.0	11	45.5					
Regia Università di Roma.....	188	49.5	37	49.1					
Regia Università di Siena.....	4	50.0	4	75.0					
Regia Università di Torino.....	2	0.0	0	0.0					
JAPAN									
Japan Medical College, Tokyo.....	1	100.0	1	100.0					
LATVIA									
Latvijas Universitāte, Riga.....	0	0.0	1	100.0					
LEBANON									
American University of Beirut.....	3	0.0	2	0.0					
Université de St. Joseph, Beyrouth.....	3	66.7	0	0.0					
MEXICO									
Escuela Libre de Homeopatía del Estado de Puebla.....	1	100.0	1	100.0					
Escuela Médico Militar, México, D. F.....	4	75.0	1	100.0					
Instituto Literario y Científico, San Luis Potosí.....	1	100.0	0	0.0					
Universidad Nacional, México, D. F.....	13	46.2	0	0.0					
NETHERLANDS									
Rijks-Universiteit te Leiden.....	3	0.0	0	0.0					
Rijks-Universiteit te Utrecht.....	0	0.0	1	0.0					
Universiteit van Amsterdam.....	1	0.0	0	0.0					
NORWAY									
Kongelige Frederiks Universitet, Oslo.....	1	0.0	0	0.0					
POLAND									
Uniwersytet Jana Kazimierza, Lwów.....	4	50.0	0	0.0					
Uniwersytet Józefa Piłsudskiego, Warszawa.....	1	0.0	2	50.0					
Uniwersytet Stefana Batorego, Wilno.....	1	0.0	0	0.0					
PORTUGAL									
Universidade de Lisboa.....	4	75.0	0	0.0					
RUMANIA									
Universitatea din Bucuresti.....	2	50.0	0	0.0					
Universitatea Regele Ferdinand I-lea din Cluj.....	7	57.1	0	0.0					
SCOTLAND									
Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow.....	1	0.0	0	0.0					
Licentiate of the Royal College of Physicians of Edinburgh.....	1	0.0	0	0.0					
Licentiate of Edinburgh.....									
Surgeons of Edinburgh.....	8	0.0	0	0.0					
Licentiate of the Royal C of the Roy School of Medicine of the Royal Colleges, Edinburgh.....	125	21.6	61	19.7					
University of Aberdeen.....	1	0.0	0	0.0					
University of Edinburgh.....	14	14.3	0	0.0					
University of Glasgow.....	66	16.6	4	0.0					
University of St. Andrews.....	32	0.0	7	0.0					
SOUTH AFRICA, UNION OF									
University of Cape Town.....	1	0.0	0	0.0					
SPAIN									
Universidad Central de España, Madrid.....	5	20.0	0	0.0					
Universidad de Santiago.....	1	0.0	0	0.0					
Universidad de Sevilla.....	1	0.0	0	0.0					
SWITZERLAND									
Universität Basel.....	63	27.0	40	25.0					
Universität Bern.....	127	35.4	58	32.8					
Universität Zürich.....	66	27.3	28	35.7					
Université de Genève.....	66	27.3	21	42.9					
Université de Lausanne.....	46	22.6	25	32.0					
TURKEY									
University of Istanbul.....	1	100.0	1	100.0					
UNION OF SOCIALIST SOVIET REPUBLICS									
First Moscow Medical Institute.....	2	50.0	0	0.0					
Khar'kov Medical Institute.....	4	50.0	0	0.0					
River Medical Institute.....	3	66.7	1	100.0					
Military Medical Academy, Leningrad.....	1	100.0	0	0.0					
Psycho.....	1	100.0	0	0.0					
Saratov ..	4	75.0	0	0.0					
Second ..	1	0.0	0	0.0					
Tomsk ..	1	0.0	0	0.0					
YUGOSLAVIA									
Beogradskog Univerziteta.....	2	50.0	0	0.0					
Zagrebaskog Univerziteta.....	1	0.0	0	0.0					

or first papers as a condition precedent to taking the state board examinations and fifteen of these states require full citizenship. In some states the requirement is made by rule of the medical board, in others the provision is by statute. In addition, other restrictions are imposed. Nine states require a certificate in the basic sciences. Twenty-two states require a one year internship in a United States hospital approved for intern training. In nine states there is a requirement of a senior year's work in an approved medical school in the United States. In three states the candidate must be in possession of the certificate of the National Board of Medical Examiners. Application for licensure must be on file six months prior to the date of examination in two states.

TABLE 23.—Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930-1938

Year	Number Examined	Passed	Percentage Failed
1930.....	167	92	44.9
1931.....	158	91	42.4
1932.....	182	96	47.3
1933.....	200	129	35.5
1934.....	255	170	40.2
1935.....	437	303	30.7
1936.....	558	382	35.0
1937.....	920	637	30.8
1938.....	1,166	716	38.6
Totals.....	4,103	2,616	36.3

Many of the foreign graduates are seeking or are serving internships in approved hospitals. In 1937 there were 245 employed in 105 hospitals throughout nineteen states. In 1938, 149 approved hospitals in twenty-nine states reported a total of 312. The Council has adopted the following resolution in an effort to assist hospitals in solving the perplexing problems associated with the selection of graduates from foreign schools:

Resolved, That, when suitable graduates of class A schools in the United States and Canada are not available, hospitals approved for intern training may accept graduates of European universities who have passed parts I and II of the examinations of the National Board of Medical Examiners.

Table 19 presents statistics covering physicians examined on the basis of credentials obtained in countries other than the United States and Canada by licensing boards of the United States and by Hawaii and Puerto Rico in 1938. It is not known how many are citizens of the United States. The figures in the accompanying tabulations therefore represent both American and foreign born physicians educated abroad. Seventy-nine medical faculties, excluding seven licensing corporations, of eighteen European and five other countries were represented. There were 1,166 examined, of whom 716 passed and 450, 38.6 per cent, failed. Graduates of the University of Berlin (146) were examined in fourteen states, 37.0 per cent of whom failed. Twelve states examined students of the Universities of Vienna and Munich, and ten states graduates of the Universities of Heidelberg and Rome. All other schools were represented in less than ten states. Twenty-six states, Hawaii and Puerto Rico examined physicians educated abroad. The state of New York had the greatest number, 730, of whom 433 passed and 297, 40.7 per cent, failed. New Jersey examined 106, with sixty-six successful and forty unsuccessful results; 37.7 per cent failed. Illinois was third with fifty-five examined, forty-eight passed and seven, 12.7 per cent, failures.

In addition to the figures represented in this table, twenty-six graduates of foreign medical faculties were

licensed in 1938 without examination by endorsement of their credentials. This is a considerable reduction over 1937. This is due in large part, as described in the text regarding reciprocity and endorsement candidates, to the decision of the New York Board of Regents, which state licenses the majority of such physicians, no longer to admit such applicants to licensure without examination.

Relative to the registration by the state of New York of graduates of the extramural schools in Great Britain, the New York State Education Department in January 1939 further directed that such registrations cease for all students hereafter admitted to these institutions and that the department no longer issue qualifying certificates to American students seeking admission to these schools. The department will continue to recognize, however, those already having received the qualifying certificate and already engaged in study in these schools. The schools referred to are the School of Medicine of the Royal Colleges, Edinburgh; Anderson College of Medicine, Glasgow; St. Mungo's College Medical School, Glasgow, and the Schools of Surgery, Royal College of Surgeons in Ireland, Dublin.

Chart 3, page 1716, shows in graphic form the states which during 1938 registered graduates of foreign medical faculties by examination, reciprocity and endorsement, or both. Included in the figures on the chart are those licenses granted by reciprocity and endorsement on the basis of a license obtained after examination from a medical board in this country. From a perusal of tables 2, 5 and 7 it can be ascertained how many were licensed by both these means in the various states. The states which licensed more than five graduates are indicated in black on the chart; those shaded, five or less. Fourteen states registered more than five, sixteen less than five. These thirty states altogether registered 819.

In table 22 are assembled figures showing the standing during the five year period 1933-1937 of the graduates of faculties of medicine outside the United States and Canada admitted to licensing examinations in this country. Included also is a tabulation for the year 1938. One hundred and twenty-nine foreign faculties and ten of the licensing corporations of Great Britain were represented. During the five year period, 2,430 were examined and, in 1938, 1,166. The largest number from any one school in the five year period was the University of Vienna, 200, of whom 27.5 per cent failed. The University of Rome in the five year period was second, 188, of whom 49.5 per cent failed. There were 180 from the University of Berlin with 31.7 per cent failures.

Table 23, the last in this group of statistics, records the number of graduates of faculties of medicine abroad examined in the United States in nine years, 1930 to 1938 inclusive. There were 246 more examined in 1938 than in 1937 and 999 more than in 1930. During the nine year period, 4,103 were examined, of whom 2,616 passed and 36.3 per cent failed.

The Council on Medical Education and Hospitals does not grade or classify medical schools outside the United States and Canada. No opportunity is afforded for visiting and inspecting such schools, nor are official reports received from them. The Council therefore has no evidence on which to base a rating. A list of foreign schools which has been published from time to time merely serves as a key to the American Medical Directory and indicates the names of the institutions which physicians now licensed to practice in the United States attended or from which they graduated.

EXAMINING BOARDS IN MEDICAL SPECIALTIES

The House of Delegates of the American Medical Association at its annual session in 1933 passed the following resolution:

Resolved, That the Council on Medical Education and Hospitals is hereby authorized to express its approval of such examining boards in medical specialties as conform to the standards of administration formulated by the Council; and be it further

Resolved, That the Board of Trustees of the American Medical Association be urged to use the machinery of the American Medical Association, including the publication of its directory, in furthering the work of such examining boards as may be accredited by the Council.

Standards were formulated by the Council and approved by the House of Delegates, June 11-15, 1934. Thirteen boards have to date been approved, and those certified at the time of the publication of the fifteenth edition of the American Medical Directory are identified in the directory by the key A.B. 1, 2, and so on. The key number of the boards, the year incorporated and the

Certificates Awarded by Examining Boards in Medical Specialties

Key A B	Name of Board	Year	Certificates Awarded (Active Diplomates)
1	American Board of Pediatrics	1933	1,335
2	American Board of Psychiatry and Neurology	1934	617
3	American Board of Orthopaedic Surgery	1934	578
4	American Board of Dermatology and Syphilology	1932	415
5	American Board of Radiology	1934	1,199
6	American Board of Urology	1935	553
7	American Board of Obstetrics and Gynecology	1930	792
8	American Board of Internal Medicine	1935	1,703
9	American Board of Pathology	1936	689
10	American Board of Ophthalmology	1917	1,600
11	American Board of Otolaryngology	1924	2,807
12	American Board of Surgery	1937	1,039
13	American Board of Anesthesiology	1937	47
Total			13,374

number of certificates awarded to date appear in the following tabulation. The number certified by some of the boards has been reduced by death. Recorded therefore are the active diplomates.

To date 13,374 have been certified in thirteen specialties. Each of these boards has published a booklet containing a brief statement regarding its organization personnel, purposes and qualifications for eligibility for certification, which is available on request to the officers of these boards or to the American Medical Association.

BASIC SCIENCE BOARDS

Boards for the examination in the basic sciences of all those desiring ultimately the right to practice the healing art functioned in eleven states and the District of Columbia in 1938, namely Arizona, Arkansas, Colorado, Connecticut, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, Washington and Wisconsin. Basic science requirements were established in Michigan in 1937 but do not apply to any person matriculated in any medical, osteopathic or chiropractic school or college on or before Oct. 15, 1937. South Dakota enacted a basic science law in 1939 but it does not apply to students regularly registered and enrolled as of March 15, 1939, in schools of medicine, osteopathy and chiropractic. The years in which the various acts were enacted are shown in table 1.

Statistics based on the number of candidates certified in 1938 and those who failed to secure this certification, together with the totals for other years shown for comparison, are included in the accompanying tabulations. Similar data have been published in the State Board Number of THE JOURNAL since 1928.

The subjects in which examinations are conducted in the respective states and the District of Columbia are given in table 2. The subjects included in basic science examinations are specified by the statutes. The

TABLE 1.—States Having Basic Science Laws and Year of Enactment

Arizona	1933	Minnesota	1927
Arkansas	1929	Nebraska	1927
Colorado	1937	Oklahoma	1937
Connecticut	1925	Oregon	1933
District of Columbia	1929	South Dakota	1939
Iowa	1935	Washington	1927
Michigan	1937	Wisconsin	1925

examination boards may neither add to nor subtract from such subjects. While the laws of some of these states include reciprocal agreements, the certificate is obtainable after examination in the majority of instances.

Applicants examined during 1938 in the various groups—physicians, osteopaths, chiropractors or students, and those unclassified—are included in table 3. The twelve boards functioning examined 1,325 candidates. Of this number, 1,168 were doctors of medicine, eighty-one osteopaths and thirty-two chiropractors; for forty-four it was not possible to determine what profession they represented. In applying for a basic science certificate it is not necessary in several of the states to mention the school of practice, but by checking the biographic records of the American Medical Association it has been possible to determine what profession the majority of the candidates represented. The remainder compose the unclassified group. Of all examined, 1,095 passed and 230 failed, 17.4 per cent. Of the physicians examined 12.2 per cent failed. Of the osteopaths 42 per cent, of the chiropractors 75 per cent and of those unclassified 68.2 per cent. There

TABLE 2.—Subjects of Examinations

	Examinations Required in							Hygiene and Public Health
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	
Arizona	+	+	+		+	+	+	.
Arkansas	+	+	+			+	+	.
Colorado	+	+	+			+	+	..
Connecticut	+			+	+	+	+	..
Dist. Columbia	+	+	+			+	+	.
Iowa	+	+	+		+	+	+	.
Michigan	+	+	+			+	+	+
Minnesota	+	+	+		+	+	+	+
Nebraska	+	+	+		+	+	+	..
Oklahoma	+	+	+			+	+	..
Oregon	+		+		+	+	+	.
South Dakota	+	+	+			+	+	.
Washington	+		+		+	+	+	.
Wisconsin	+			+		+	+	.

were 1,026 physicians who passed, forty-seven osteopaths, eight chiropractors and fourteen unclassified. Minnesota examined the largest number, 266, of whom 21.1 per cent failed. The next largest number, 198, were examined in Wisconsin, with 8.1 per cent failures. Osteopaths were examined in Arizona, Arkansas, Colorado, Connecticut, District of Columbia, Iowa, Minnesota, Nebraska, Oregon, Washington and Wisconsin: in fact, in every state except Oklahoma. Chiropractors were examined in Connecticut, Iowa, Minnesota,

Oregon, Washington and Wisconsin. The highest percentage of failures, 37.5, was in Iowa, which examined forty physicians, sixteen osteopaths, three chiropractors and thirteen unclassified candidates.

The number of certificates granted by examination, reciprocity and endorsement are recorded in table 4. A total of 1,095 certificates were granted after examination; 1,026 were issued to physicians, forty-seven to osteopaths, eight to chiropractors and fourteen to

TABLE 3.—Applicants Examined—1938

	Physicians		Osteopaths		Chiro-prac-tors		Un-classified		Total Examined	Passed	Failed	Percentage Failed
	P	F	P	F	P	F	P	F				
Arizona.....	41	0	4	0	0	0	0	13	58	45	13	22.4
Arkansas.....	65	3	5	0	0	0	2	0	75	72	3	4.0
Colorado.....	29	6	2	1	0	0	0	1	39	31	8	20.6
Connecticut.....	131	2	1	2	1	2	0	0	139	133	6	4.3
District of Columbia	23	7	1	1	0	0	0	0	32	24	8	25.0
Iowa.....	26	14	12	4	0	3	7	6	72	45	27	37.5
Minnesota.....	202	40	5	8	2	3	1	5	266	210	56	21.1
Nebraska.....	84	19	0	3	0	0	0	0	106	84	22	20.8
Oklahoma.....	68	10	0	0	0	0	0	0	78	68	10	12.8
Oregon.....	67	14	2	2	0	1	3	3	92	72	20	21.7
Washington.....	124	25	2	7	3	9	0	0	170	129	41	24.1
Wisconsin.....	106	2	13	6	2	6	1	2	138	132	6	4.3
Totals—Examined...	1,168		51		32		44		1,325			
Totals—Passed.....	1,026		47		8		14		1,095			
Totals—Failed.....	142		34		24		30			230		
Percentage failed....	12.2		42.0		75.0		68.2					17.4

persons who were unclassified. In addition there were 293 candidates certified without examination, by reciprocity or endorsement, consisting of 267 physicians, twenty-four osteopaths and two listed as unclassified. Iowa accepted the greatest number without examination, seventy, of whom sixty-nine were physicians and one was an osteopath. Minnesota registered sixty-three physicians and five osteopaths by this method. Wisconsin certified forty-two physicians, seven osteopaths and one unclassified, and Arkansas thirty-seven

TABLE 4.—Certificates Issued by Examination, Reciprocity and Endorsement—1938

	Examination				Reciprocity and Endorsement				Registered
	Physicians	Osteopaths	Chiropractors	Unclassified	Physicians	Osteopaths	Chiropractors	Unclassified	
Arizona.....	41	4	0	0	45	0	0	0	45
Arkansas.....	65	5	0	2	72	37	6	0	115
Colorado.....	29	2	0	0	31	15	2	0	48
Connecticut.....	131	1	1	0	133	0	0	0	133
District of Columbia	23	1	0	0	24	22	0	0	46
Iowa.....	26	12	0	7	45	69	1	0	115
Minnesota.....	202	5	2	1	210	63	5	0	278
Nebraska.....	84	0	0	0	84	8	1	0	93
Oklahoma.....	68	0	0	0	68	0	0	0	68
Oregon.....	67	2	0	3	72	11	2	0	85
Washington.....	124	2	3	0	129	0	0	0	129
Wisconsin.....	106	13	2	1	132	42	7	0	181
Totals.....	1,026	47	8	14	1,095	267	24	0	293

physicians and six osteopaths. Arizona, Connecticut and Washington licensed none without examination. Arizona, and Washington, by law, have no reciprocal agreements. No chiropractors were licensed without examination but two in the unclassified group were certified by this method.

The number of candidates examined, or certified by reciprocity or endorsement, from 1927 to 1938 inclusive will be found in table 5. In 1928, when five boards were functioning, there were 646 physicians examined,

of whom sixty, or 9.3 per cent, failed and fifty-nine other practitioners, of whom twenty-eight, or 47.5 per cent, failed. In 1938, 1,293 physicians and ninety-five other practitioners were certified. During the twelve year period a total of 9,370 physicians were examined, of whom 1,122, 12.0 per cent, failed and 931 other practitioners, of whom 507, 54.5 per cent, failed. During this period 1,532 physicians were certified without examination, while only ninety-one other practitioners were so registered.

Altogether, 10,295 certificates have been issued by basic science boards since 1927, of whom 9,780 were granted to physicians and 515 to other practitioners. From the high percentage of failures in the other practitioner group it seems apparent that the enforcement

TABLE 5.—Total Candidates—1927-1938

	Number of Boards	Physicians						Other Practitioners					
		Examinations				Endorse- ment	Total Certified	Examinations				Endorse- ment	Total Certified
		Examined	Passed	Failed	Percentage Failed			Examined	Passed	Failed	Percentage Failed		
1927	5	305	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	53.0	0	31
1930	7	685	606	79	11.5	118	724	78	30	48	61.5	4	34
1931	7	680	586	94	13.8	141	727	107	48	59	55.1	0	48
1932	7	657	590	67	10.2	106	696	78	44	34	43.6	12	56
1933	8	601	527	74	12.3	121	648	60	30	30	50.0	10	40
1934	9	815	725	90	11.0	127	852	51	20	25	49.0	11	37
1935	10	852	761	121	13.7	110	871	74	33	41	55.4	4	37
1936	10	1,032	891	141	13.7	230	1,121	66	26	40	60.6	13	39
1937	12	1,231	1,061	170	13.8	192	1,253	113	41	72	63.7	10	51
1938	12	1,168	1,026	142	12.2	267	1,293	157	69	88	66.1	26	95
Total		9,370	8,248	1,122	12.0	1,532	9,780	931	424	507	54.5	91	515

of basic science laws affects most seriously this group. The object of these boards has been to provide a means of insuring that all candidates seeking authority to care for sick and injured people shall first possess a reasonable knowledge of the sciences fundamental to the healing art. Basic science bills are being advocated in several states and bills are pending in the legislature.

NATIONAL BOARD OF MEDICAL EXAMINERS

The National Board of Medical Examiners was organized in 1915 and chartered March 17, 1922, under the laws of the District of Columbia. Its purpose was to establish in this country a qualifying examination of such character that successful candidates could be admitted to the practice of medicine by state boards of medical licensure. Its constitution provides for a membership of thirty. This includes six members representing the federal services, five members nominated by the Federation of State Medical Boards of the United States, three members nominated by the Association of American Medical Colleges, two members nominated by the Council on Medical Education and Hospitals of the American Medical Association, and fourteen members elected at large.

Statistics are herewith presented regarding the examinations of and the issuance of certificates by the National Board of Medical Examiners. Similar material has been presented in the State Board Number of THE JOURNAL for twenty-one years.

Up to Dec. 31, 1921, eleven examinations were held as shown in table 1.

Since 1922 the examination has been given in three parts, parts I and II being written examinations and part III a practical and clinical examination. The data included in the following paragraphs refer to the examination and the issuance of certificates to this group and

TABLE 1—Examinations—1916-1921

Date of Examination	Total Examined	Passed	Failed	Percentage Failed
October 1916	10	5	5	50.0
June 1917	12	9	3	25.0
October 1917	23	22	1	4.3
January 1918	20	18	2	10.0
April 1918	23	18	5	21.7
December 1918	16	15	1	6.3
June 1919	52	51	1	1.9
February 1920	48	36	12	25.0
May 1920	60	46	14	23.3
February 1921	16	11	5	31.3
June 1921	40	37	3	7.5
Totals	325	268	57	14.3

include tables enumerating the results of examinations in parts I, II and III for each calendar year, excluding duplications by counting the last examination if more than one part is taken within the year, and also of those certified or failing of certification.

Candidates are required to take all six subjects of part I at a regular examination period unless entitled to take an incomplete examination or electing to take a divided examination. An incomplete examination is

TABLE 2—Examinations in Part I in 1938 and 1922-1938

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February	163	101	34	28	21.7
May	10	15	0	1	6.3
June	965	650	239	76	10.5
September	509	219	235	55	20.1
Totals	1,633	985	508	140	14.0
1922	388	263	56	67	20.3
1923	507	349	77	81	18.6
1924	591	415	69	107	20.5
1925	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	150	91	16.8
1928	843	533	231	79	12.9
1929	1,006	675	331	90	11.8
1930	1,260	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	809	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,633	985	508	160	14.0
Totals	17,375	11,016	4,579	1,780	13.9

arranged for candidates taking part I at the end of their second medical year in schools in which the third year curriculums include courses in one or two subjects of this part. The subjects thus postponed may be taken at any examination period after the candidate has completed them in his medical school. Any candidate not entitled to take an incomplete examination in part I may, if he so elects, take a divided examination by writing any four subjects at one time and the remaining two within thirteen months, but after at least one semester of study. Incomplete examinations were not included when percentages were being computed, since they represent neither a candidate eligible for certification nor a failure.

A candidate who fails to make an average of 75 per cent but has received grades of at least 75 per cent in three or more main divisions is required to repeat those divisions, either in whole or in part, in which he received grades below 75 per cent. Grades below 60

per cent in any of the subdivisions are not acceptable if the grade for the corresponding main division is under 75 per cent. In such cases the candidate is "referred" in this subdivision and required after a three months interval to pass a reexamination. The privilege of a second reexamination is determined in each case by the board "Referred" candidates are likewise excluded from the statistics.

Four examinations in part I were held in 1938, as indicated in table 2. Altogether 1,653 examinations were given, 985 passed, 508 were given incomplete examinations and 160, or 14.0 per cent, failed.

TABLE 3—Examinations in Part II in 1938 and 1922-1938

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February	169	161	0	8	4.7
May	378	338	0	20	5.3
June	245	231	0	14	5.7
September	69	65	0	4	5.8
Totals	861	815	0	46	5.3
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.7
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.0
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	768	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
Totals	9,118	8,249	36	833	9.2

Four examinations were also given in part II, figures for which appear in table 3. During 1938, 861 were so examined, of whom 815 passed and forty-six, 5.3 per cent, failed.

Since 1922 a total of 17,375 examinations have been given in part I and 9,118 in part II. From 1922 to 1938 inclusive, 11,016 individuals were successful in passing part I and 8,249 in passing part II. The figures cover the totals of each examination given dur-

TABLE 4—Examinations in Part III—1922-1938

	Total Examinations*	Passed	Failed	Percentage Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	275	243	12	4.7
1927	298	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	543	19	3.4
1935	575	578	20	3.5
1936	576	547	29	5.0
1937	663	630	33	5.7
1938	706	682	24	3.4
Totals	6,744	6,440	304	4.5

Between 1916 and 1921 a total of 225 were examined, of whom 24 passed and 37, 14.3 per cent, failed. Total certificates awarded, 6,709.

* Excluding "referred" examinations.

ing a calendar year and include some who fail and are reexamined during the same year and also some who pass parts I and II in the same year. Therefore they represent examinations conducted rather than individuals examined. In the seventeen year period since 1922 there have been 1,780 failures in part I, 13.9 per cent, and 833 in part II, 9.2 per cent.

The results of examinations in part III for the seventeen year period 1922 to 1938 inclusive are represented in table 4. In 1938, 706 were examined, as compared with only twenty-two in 1922. Of the number examined in 1938, twenty-four, or 3.4 per cent, failed. The highest percentage of failures was in 1927, when 293 were examined and twenty-one, 7.2 per cent, failed. In seventeen years 6,744 were examined, of whom 6,440 were granted certificates and 304, 4.5 per cent, failed. Here again a candidate having failed may subsequently receive a certificate.

From 1916 to 1921, when the examination was not given in three parts, 325 were examined, of whom 268 passed and fifty-seven, 14.3 per cent, failed.

Altogether from 1916 up to and including 1938, 6,708 certificates have been granted.

The number of persons examined during any one year is given in table 5. The classification as passed or failed, in cases in which more than one examination has been taken in a given year, was based on the results of the last examination during the year in question. For

TABLE 5.—Parts I, II and III, Excluding
Duplications—1922-1938

	Total Examined*	Passed	Incom- plete	Failed	Percentage Failed
1922.....	525	381	58	86	18.4
1923.....	775	594	79	102	14.7
1924.....	978	756	69	153	16.8
1925.....	1,167	915	50	202	18.1
1926.....	1,161	930	105	126	11.9
1927.....	1,248	947	142	159	14.4
1928.....	1,430	1,101	211	118	9.7
1929.....	1,723	1,280	319	124	8.8
1930.....	2,044	1,547	322	175	10.2
1931.....	2,218	1,632	410	176	9.7
1932.....	2,342	1,850	355	137	6.9
1933.....	2,277	1,806	280	191	9.6
1934.....	2,261	1,801	330	130	6.7
1935.....	2,308	1,831	408	129	6.6
1936.....	2,517	1,989	333	175	8.1
1937.....	2,735	2,151	397	167	8.0
1938.....	2,990	2,306	493	191	7.7
Totals.....	30,759	23,817	4,381	2,561	9.7

* Excluding "referred" examinations.

example, if in 1938 a candidate passed part I but later failed part II, he is listed as having failed. Taking this into consideration, there were 2,990 who took at least one of the examinations of the National Board of Medical Examiners during 1938, as compared with 525 in 1922. A total of 30,759 were examined in one or more of the examinations in the seventeen years shown, of whom 23,817 passed, 2,561 failed, 4,381 took incomplete examinations and 9.7 per cent failed.

Examinations in part III were held during 1938, at which 682 were successful. Graduates of fifty-nine approved schools in the United States and four in Canada were examined. Thirteen graduates of medical faculties abroad were also certified. Table 6 records the number of diplomates from each school certified in 1938 in part III. At the College of Medical Evangelists students are required to pass parts I and II as a prerequisite to receiving their diploma. The comprehensive qualifying examination, or part I of the examination of the National Board, is required of all medical students entering Yale University School of Medicine in the fall of 1937. Students at Georgetown University School of Medicine are urged to take the examinations of the National Board. Students admitted to Boston University School of Medicine subsequent to 1937 are required to pass part I in order to supplement the qualifications for promotion to the third year class. All students before entering the senior class at the New

York Medical College must have taken part I of the examination of the National Board. While the certificate is not required by these schools, their graduates and, in addition, those of Harvard, Tufts and Duke University represented the majority of those certified.

Diplomates licensed on the basis of their credentials have increased from two in 1917 to 673 in 1938, 4,793

TABLE 6.—Diplomates from Individual Medical Schools—1938

	Certificates Awarded		Certificates Awarded
Univ. of Arkansas.....	1	Albany Med. Coll.....	10
Coll. of Med. Evan.....	85	Columbia Univ.....	7
Stanford Univ.....	7	Cornell Univ.....	19
Univ. of California.....	3	Long Island Coll. of Med..	8
Univ. of Southern Calif..	1	N. Y. Med. Coll.....	55
Univ. of Colorado.....	9	New York Univ.....	13
Yale Univ.....	41	Syracuse Univ.....	4
George Washington Univ..	11	Univ. of Buffalo.....	3
Georgetown Univ.....	49	Univ. of Rochester.....	1
Howard Univ.....	2	Duke Univ.....	38
Emory Univ.....	2	Univ. of Cincinnati.....	1
Univ. of Georgia.....	3	Western Reserve Univ.....	1
Loyola Univ.....	3	Univ. of Oklahoma.....	4
Northwestern Univ.....	15	Univ. of Oregon.....	1
Rush Med. Coll.....	12	Hahnemann, Phila.....	1
Div. of Biological Sc., U.	1	Jefferson Med. Coll.....	2
Chicago.....	7	Temple Univ.....	7
Univ. of Illinois.....	2	Univ. of Pennsylvania.....	5
State Univ. of Iowa.....	4	Woman's Med., Pa.....	4
Univ. of Kansas.....	2	Med. Coll. of S. C.....	2
Univ. of Louisville.....	3	Meharry Med. Coll.....	1
Tulane Univ.....	5	Univ. of Tennessee.....	1
Johns Hopkins Univ.....	10	Baylor Univ.....	1
Boston Univ.....	34	Univ. of Vermont.....	15
Harvard Univ.....	52	Med. Coll. of Virginia.....	3
Tufts Coll. Med. Sch.....	42	Marquette Univ.....	8
Univ. of Michigan.....	7	Univ. of Wisconsin.....	1
Wayne Univ.....	2	Dalhousie Univ.....	2
Univ. of Minnesota.....	9	McGill Univ.....	10
St. Louis Univ.....	5	Univ. of Manitoba.....	2
	6	Univ. of Toronto.....	1
	1	Foreign.....	13
Total.....	682		

having been so licensed since the National Board was formed. However, 6,708 have received the certificate of the board. In 1938 diplomates were registered on the basis of credentials in thirty-eight states, the District of Columbia, Alaska, Hawaii and Puerto Rico.

The certificate of the National Board of Medical Examiners is granted recognition by the licensing boards of forty-four states and Alaska, Canal Zone, Hawaii and Puerto Rico (table 7).

TABLE 7.—States Endorsing Certificates of National Board of
Medical Examiners

Alabama	Illinois	Montana	Pennsylvania
Alaska	Indiana	Nebraska	Puerto Rico
Arizona	Iowa	Nevada	Rhode Island
Arkansas	Kansas	New Hampshire	South Carolina
California	Kentucky	New Jersey	South Dakota
Canal Zone	Maine	New Mexico	Tennessee
Colorado	Maryland	New York	Utah
Connecticut	Massachusetts	North Carolina	Vermont
Delaware	Michigan	North Dakota	Virginia
Dist. of Columbia	Minnesota	Ohio	Washington
Georgia	Mississippi	Oklahoma	West Virginia
Hawaii	Missouri	Oregon	Wyoming

Some of these boards have additional requirements.

Diplomates of the National Board of Medical Examiners are admitted to the final examination given by the Conjoint Examining Board of England and Ireland and the Triple Qualification Board of Scotland. The certificate is accepted by the United States Army for admission to its Medical Corps and also by the United States Public Health Service and is recognized also in Lebanon, South Africa, Spain and Turkey.

Examinations in parts I and II are held at class A medical schools where there are five or more candidates desiring to be examined, and part III is held in twenty-two established centers throughout the United States.

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SATURDAY, APRIL 29, 1939

OBITUARIES OF PHYSICIANS PUBLISHED IN 1938

The number of obituaries of physicians published in THE JOURNAL during 1938 was 3,768, including 3,630 of the United States as compared with 3,277 in 1937, also 138 of Canadian physicians. Four died in the Philippine Islands, 3 each in Mexico and Puerto Rico, 2 each in Cuba and France, and 1 each in Africa, the Canal Zone, England, India and Korea. The obituaries of 108 women physicians were published, as compared with 113 in 1937. The number of graduates of medical schools in the United States for the fiscal year ended June 30, 1938, was 5,194. Deducting the number of physicians whose obituaries were published, there was a net addition to the profession for the year of 1,564, not including physicians coming to the United States from abroad.

Ages.—The average age at death of those classified as of the United States was 65.6, as compared with 65.4 in 1937. Thirty-two physicians died between the ages of 25 and 29, fifty-two between 30 and 34, seventy-three between 35 and 39, eighty-one between 40 and 44, 158 between 45 and 49, 250 between 50 and 54, 403 between 55 and 59, 524 between 60 and 64, 590 between 65 and 69, 535 between 70 and 74, 421 between 75 and 79, 312 between 80 and 84, 144 between 85 and 89, forty-three for 90 and eight for 95 and over. In four cases the age was not determined.

Causes of Death.—Heart disease was again the leading cause of death, as it has been for many years. Some contributory causes are also included in THE JOURNAL's tabulation as they have been in former years. For example, when a report of the cause of death gave chronic nephritis and heart disease, it was published as such in THE JOURNAL and was reported on the statistical charts under both diseases. Thus heart disease was reported as a cause of death in 1,491 cases. Endocarditis or myocarditis was specified in 396 cases,

coronary thrombosis in 337, coronary occlusion in 167 and angina pectoris in 84. Other diseases of the heart caused 507 deaths. Arteriosclerosis was the second most frequent cause, with 442. Cerebral hemorrhage was the third most frequent cause with 384 deaths; 28 additional deaths were reported as due to paralysis. Fourth on the list was pneumonia with 350 deaths, of which 111 were specified as bronchopneumonia. Of 334 deaths reported as due to cancer, the stomach and liver were reported affected in 66 cases, the prostate gland in 51, the intestine in 42, the female genital organs in 5; in 180 cases the part affected was not specified. Nephritis was reported as the cause of 204 deaths. The number of cases in which hypertension was reported was 125, embolism and thrombosis exclusive of coronary thrombosis 124, uremia 99, other diseases of the urinary system 73, diabetes 77, tuberculosis 70, other diseases of the respiratory system 5, diseases of the prostate other than cancer 54, cirrhosis of the liver 44, other diseases of the liver 11, senility 33, ulcer of the stomach and duodenum 29, other diseases of the digestive system 22, septicemia 28, peritonitis 24, influenza 23, leukemia and intestinal obstruction 22 each, appendicitis 18, pernicious anemia 17, cholecystitis 16, encephalitis and paralysis agitans 15 each, arthritis 14, biliary calculi and chronic bronchitis 13 each, hemorrhage 12, meningitis and gangrene 11 each, brain tumor 10, other tumors 4, hernia 9, abscesses 8, Hodgkin's disease, aplastic anemia and aneurysm 7 each, asthma 6, diseases of the veins and typhoid 5 each, cerebral sclerosis, empyema, osteomyelitis, shock and streptococcal infection 4 each, carbuncle, diverticulitis, malaria, obstructive jaundice, pleurisy and streptococcal infection of the throat 3 each, Addison's disease, Adams-Stokes syndrome, amyotrophic lateral sclerosis, bacillary dysentery, cerebral softening, diverticulosis, esophageal varix, granulocytopenia, dementia paralytica, heat prostration, multiple sclerosis, myelitis, sinusitis, pyloric stenosis, ruptured gallbladder, tonsillitis, undulant fever and secondary anemia 2 each. Other diseases causing one death each as reported were abscessed teeth, actinomycosis, alcoholism, amebic dysentery, asphyxiation caused by deformity of the spine, calcification of the pineal gland, cellulitis, cerebral anemia, diphtheria, disease of the adrenal glands, duodenal perforation, erysipelas, food poisoning, furunculosis, gas bacillus infection, ileitis, laryngospasm, Ludwig's angina, lymphoma, mastoiditis, mediastinitis, multiple myeloma, multiple neuritis, occlusion of the popliteal artery, otitis media, paraldehyde poisoning, paralytic ileus, parotitis, pellagra, persistent thymus, pulmonary fibrosis, purpura haemorrhagica, respiratory failure, rupture of the aorta, rupture of the heart, spinal sclerosis, splenitis, sponta-

neous pneumothorax, subarachnoid hemorrhage, tetanus, typhoid fever, toxic purpura, tularemia, varicose ulcer and vesical calculi.

Accidental Deaths.—One hundred and fifty-five physicians died as the result of accidents in 1938, compared with 151 in the previous year. Automobile accidents accounted for 81 deaths, falls 30, drowning 9, burns 7, airplane accidents 4, carbon monoxide gas 3, illuminating gas 2, shooting 2, explosions, overdose of medicine, poison, street car and train accidents 1 each. In 8 cases unexplained fractures were given as causes of death. One physician died of injuries received when he was struck by a motorcycle, one of an accidental wound from a hypodermic needle and one from the bite of an insect.

Suicides and Homicides.—Suicide was the cause of eighty-one deaths of physicians in 1938. Bullet wounds accounted for 31 of these deaths, carbon monoxide poisoning 9, overdoses of medicine 7, jumping 6, incised wounds 6, gas and hanging 5 each, poison 4, stabbing 2, burns 1. One physician jumped in front of a train. In five cases the method was not reported; in addition four deaths from the following causes could not be classified because of insufficient information: falls from window 2, carbon monoxide poisoning 1, shooting 1. There were six homicides.

Civil Positions.—Among the decedents were 206 physicians who were or had been teachers in medical schools, 466 who had served in the World War, 13 veterans of the Civil War and 70 veterans of the Spanish-American War. One hundred and eighty-one were or had been health officers, 151 members of boards of education, 72 members of boards of health and 21 members of state boards of medical examiners. There were 75 who were or had been coroners, 51 mayors, 39 members of state legislatures, 32 authors, 26 bank presidents, 15 pharmacists, 15 members of city councils, 12 editors, 10 postmasters, 10 police surgeons, 8 dentists, 7 missionaries, 5 clergymen, 4 lawyers, 2 justices of the peace, 1 United States Senator, 1 Congressman and 1 judge. There were 21 members of the United States Army Medical Corps, 12 of the United States Navy Medical Corps, 13 of the United States Public Health Service, 13 of the Veterans' Administration and 5 of the Indian Medical Service.

Association Officers.—Among those who died who were or had been officers of the American Medical Association were 2 vice presidents and 6 section officers. Twenty members or former members of the House of Delegates died during the year. There were also 25 presidents or former presidents of state medical associations and 2 secretaries.

MEDICAL EDUCATION IN THE UNITED STATES AND ABROAD

Elsewhere in this issue are presented the figures reported by the medical examining boards of the United States. Since, for a variety of reasons, an unusually large number of applicants have come from other countries, an opportunity is afforded to compare the success before examining boards of those whose professional education has been received in approved schools in the United States with corresponding figures for those educated abroad. Reports to the Council do not distinguish between citizens of this country who, having gone elsewhere to study medicine, return here to practice, and natives of other countries who apply here for a medical license.

As a comparatively small number of physicians from some countries have taken the licensing examinations, only those countries are included from which more than twenty-five candidates were examined during 1938.

Since the number of failures among graduates of approved schools was only 3.0 per cent, it is obvious

Failures of Candidates from Abroad

	Number Examined	Percentage of Failures
Austria	136	28.7
France	43	37.2
Germany	505	41.0
Italy	165	53.9
Scotland	76	17.1
Switzerland	172	32.6
	1,097	38.3

that candidates admitted to state board examinations on the basis of foreign credentials are not as well prepared for the licensing test as those who have been educated in our own schools. It may be objected that the poor record of graduates of foreign schools is due to the fact that they have not yet mastered the English language. This explanation, however, can account only partially for the discrepancy, since many of those educated abroad were born and raised in this country.

WHAT IS OSTEOPATHY?

Is it medicine or is it not? Do schools of osteopathy teach medicine or do they not? Last year 144 applicants whose training had been received in osteopathic schools were licensed by the boards of medical examiners in ten states to practice medicine, surgery or both; 101 were licensed after examination and forty-three without examination. The numbers licensed in each of these ten states are shown in chart 2, on page 1714.

In a number of states bills have been introduced which, if passed, would give to graduates of osteopathic schools the same privileges and responsibilities that are given to graduates of approved medical schools. Is such legislation compatible with public safety or in the interest of public welfare? Proponents of these measures claim that medicine is taught as completely and as thoroughly in schools of osteopathy as in schools of medicine.

Osteopathic schools have consistently refused to permit an inspection by the Council on Medical Education and Hospitals of the American Medical Association. Recently, however, a committee of the Kansas legislature visited one of these schools and found conditions which a recognized medical school would not tolerate. In the medical sciences, anatomy, biochemistry, physiology, bacteriology and pathology the faculty was utterly inadequate both in numbers and in scientific training. For teaching the various clinical branches of medicine the number of hospital patients available was about one twenty-fifth of the number to which students at the University of Kansas have access. This school of osteopathy, at least, does not even remotely approach the generally accepted standards of education for the practice of medicine.

Current Comment

PHENYLPYRUVICA OLIGOPHRENIA

A mental condition known as phenylpyruvica oligophrenia, or imbecillitas phenylpyruvica, has recently been described by investigators in Norway,¹ England² and the United States.³ Mentally defective patients suffering from phenylpyruvica oligophrenia characteristically excrete phenylpyruvic acid in the urine, being apparently unable to oxidize and decarboxylate phenylpyruvic acid in a normal manner. The formation of phenylpyruvic acid in the body is thought to result from the oxidative deamination of the essential amino acid phenylalanine. When phenylalanine is fed to persons with this metabolic abnormality, the excretion of phenylpyruvic acid in the urine is increased. The disease is therefore characterized biochemically by the inhibition of the metabolism of phenylalanine at the stage of phenylpyruvic acid. In this connection it is noteworthy that Peters and his collaborators in England have found that the oxidation and decarboxylation of pyruvic acid in certain tissues require the presence of thiamin (vitamin B₁). Thiamin apparently serves as a precursor of cocarboxylase, the latter being thiamin pyrophosphate, and it has been reported that in many tissues a dynamic equilibrium exists between free thiamin and its pyrophosphoric acid ester. Several years ago it was established that cocarboxylase is a coenzyme necessary for the decarboxylation of pyruvic acid in certain enzyme systems. The observation of Closs and Folling that white rats on a vitamin B₁ deficient diet excrete phenylpyruvic acid when large amounts of phenylalanine are ingested and that control animals receiving thiamin chloride do not excrete phenylpyruvic acid under the same conditions is relevant. These clinical and experimental observations may be expected to stimulate further work designed to elucidate the possible relationship existing between thiamin and cocarboxylase on the one hand and the metabolic disturbance phenylpyruvica oligophrenia on the other.

A MEDICAL SOCIETY AND CONTAGIOUS DISEASE

While the interest of organized medicine in the public health is a matter of long record, recognition of that interest is rare. The part played by the Chicago Medical Society in the control of contagious disease is one of the principal aspects of a richly documented manuscript by Miss Webb¹ of the University of Chicago. Many entries in the minutes of the Chicago Medical Society from its formation in the fall of 1850 attest its activity both as a society and by many of its individual members in attempting to arouse the community to concerted and effective action in the control of contagious diseases. Although a city board of health existed for most of the period preceding the fire, Miss Webb obtained no evidence that it had even met in some years. The medical society demonstrated a constant interest in and activity for the best public health measures, as, for example, sound registration of vital statistics. In fact, Chicago's mortality records were apparently most inaccurate until 1868, the improvement at that time being the direct result of a petition of the Chicago Medical Society to the city council in 1866. "Through the years," Miss Webb states, "the only really sustained fight [for adequate protection against contagious disease] came from the medical profession, whose members realized the basic needs and urged reform." In commenting further on this matter she stated that while individual physicians had for a long time taken part in civic questions they naturally became more effective as members of an organized group.

INCREASING IMPORTATION OF PAPAIN

Papain is an enzyme of the proteolytic group, changing native proteins, proteoses and peptones to amino acids. The activity of papain is greatly increased by hydrocyanic acid, by hydrogen sulfide and by glutathione. It acts in an acid medium (p_H 4 to 7) and at temperatures of from 65 to 90 C. The papain of commerce is obtained from the melon tree (*Carica papaya*), which flourishes in tropical and subtropical regions and is obtained in the form of latex, the dried milky juice of the unripe papaya fruit. Of late, papain has been finding its greatest use in preparing "tenderized" meat. Import statistics¹ show a fourfold increase in recent years; 54,000 pounds valued at \$50,000 was imported in 1932, whereas the amount in 1938 was 223,000 pounds of crude papain valued at \$329,000. Ceylon is the largest exporter of papain to the United States, in 1938 sending 173,000 pounds; 36,000 pounds came from elsewhere in the United Kingdom with Japan, Siam and New Zealand contributing smaller quantities. Long recognized as a powerful proteolytic ferment, papain, which in several respects is an abnormal enzyme, seems now to be making a definite contribution to the enhancement of the esthetic side of our national dietary. Its usefulness as a therapeutic agent, however, is not recognized.

1. Webb, Constance B. A History of Contagious Disease Care in Chicago Before the Great Fire, Dissertation to Faculty of School of Social Service Administration, University of Chicago.

1. Chemical Division, Department of Commerce, J. Indust. & En., in Chem. News Edition 17: 134 (Feb.) 1939.

1. Folling, Asbjörn. Ztschr. f. physiol. Chem. 227: 169, 1934.

2. Penrose, L. S. Lancet 1: 23 (Jan. 5) 1935.

3. Jervis, G. A. J. Biol. Chem. 126: 305 (Nov.) 1938.

ORGANIZATION SECTION

"ECONOMICAL ADMINISTRATION OF HEALTH INSURANCE BENEFITS"

Nothing more illustrative of the dominance of financial considerations over medical science in the administration of sickness insurance has appeared than this report of the International Labour Office.¹ Like most of the publications of this office, it is the result of the work of several commissions of experts. The material has been finally arranged by Walter Pryll, social medical officer of the International Labour Office and for many years active in the administration of sickness insurance institutions in Germany. This domination of financial considerations and the economy which it enforces cannot well be criticized once the system of sickness insurance comes into existence, but its very necessity involves such restrictions on the development of medical science and its application to the large section of the population covered by insurance as to constitute in itself an indictment of the entire principle of sickness insurance.

"Social insurance institutions must base themselves on the principle of economy and, as far as possible, make it govern all their organization and working" (p. 10). "The funds are therefore compelled to strike the best balance they can between the special needs of those insured with them and the limited means at their disposal" (p. 13). Such a program must restrict the application of many types of medical care, although the funds are required to use "all the means and methods that have been approved by science and tested in practice, in so far as they are easily available at a reasonable cost" (p. 16).

We are told that "it was the principle of economy that led the insurance institutions to engage in preventive work" and that "prevention is not only easier but also cheaper than cure and than the cost of compensation" (p. 16). No illustrations are offered, however, of the extent of such preventive work under insurance or of the results it has produced, and just a little later it is admitted that the funds "must not use any of their resources for the individual or collective prevention of disease if this form of activity is not expressly prescribed or permitted by law" (p. 19).

In spite of many cleverly worded explanations intended to show that this economical administration does not injure the practice of medicine, any one accustomed to the professional attitude in a country free from insurance institutions who reads the multitude of restrictions cannot fail to be impressed with the fact that the one dominating thought that must constantly be in the physician's mind is not the welfare of the patient but the welfare of the insurance funds.

Advocates of sickness insurance in the United States who visualize great clinics of specialists using highly expensive equipment might read with profit the statement that "it is sheer extravagance to have a patient very thoroughly examined by a specialist, with the aid of the most expensive apparatus available, before considering whether such a step is necessary or likely to be fruitful, so that in the end such additional knowledge as may be obtained is bought at too great an expenditure of material, time, and money" (p. 35). In no country do insured patients customarily receive any such service.

There is an entire chapter on the application of the principle of economy to diagnosis, which alternates between emphasis on the necessity of careful diagnosis to detect incipient diseases and numerous instances of the economic obstacles which insurance must maintain that would prevent any such diagnosis. The ideal is set up not only of the diagnosis of the disease but of the "psychophysical state of the patient," of his relations to society, and of the "prognosis and plan of treatment and cure." The reader who knew nothing of insurance might think that such a diagnosis was common under insurance, but the compiler of this volume wisely does not attempt to give any examples.

When it comes to the application of the principle of economy to therapeutics, we are told that "the private practitioner may apply any methods of diagnosis and treatment which he considers necessary so far as his patient is prepared to pay the cost, whereas a practitioner who is treating insured persons must follow the principle of economy . . ." (p. 64). We are assured that "the patient must not be required to put up with second-rate methods of treatment or with cheap measures of inferior quality selected merely on grounds of economy" but that "the necessary treatment is that which alone of all the appropriate, adequate and reasonably priced methods guarantees success and is applied only so far as is necessary to achieve the purpose of the insurance scheme" (p. 72). The assumption that the "necessary treatment" which "guarantees success" can be determined would seem to require that the insurance physician have a knowledge that exceeds medical science. The point is repeatedly emphasized that in many cases rest, massage, baths or other treatment not requiring drugs or appliances may be used for reasons of economy. Perhaps this explains the renaissance of the "naturheiler" and other cults and quacks in Germany under Hitler. The physician is constantly warned against the overuse of drugs. No complaint could be made against such a warning if really based on therapeutic reasons, but the constant emphasis on economy suggests that wholly different reasons actually govern. This is true of the recommendation that only drugs included in the special formularies be used and that proprietaries be avoided. But on this point also the emphasis on the economy angle is far greater than on the scientific.

That politics even more than economy may guide the actions of the legislators is indicated by the following, which is perhaps the most significant statement in the entire report:

"Nor can the legislative authorities be guided solely by economic considerations when drawing up the regulations concerning benefits. Financial limits may be imposed, beyond which they cannot go. They may have to reject many ideas that are acceptable from the point of view of economy and agree to others that are economically unsound simply because of the relative strength of the various political parties in the government at the time" (p. 19).

There is an entire chapter on the application of the principle of economy to preventive measures, but no mention is made of immunization, and it would appear that most of these measures would consist of good advice and cooperation with health departments and special institutions for controlling such diseases as tuberculosis.

One large section is devoted to a discussion of the principle of economy in national laws and regulations. Once more it is difficult to raise a direct objection to most of these regulations, but when they are examined as a whole they give the picture of a legal cage within which the physician is compelled to practice. He is constantly warned to watch the quantity prescribed, to see that containers are returned and used again, that only certain types of prescriptions that require the least time to compound are used, and so on.

One source of economy is never mentioned. There is no discussion of the costs of administration, of the palatial offices of insurance carriers—always so much better equipped than the hospitals—or of the swarm of administrators whose expenses must be met out of the certainly inadequate income derived from poorly paid workers.

More than half the book is devoted to the national laws and regulations designed to enforce the principle of economy in Czechoslovakia, France, Germany, Great Britain, Hungary, Poland and Yugoslavia. These laws and regulations, with their provisions for the supervision of insurance practitioners and

1. *Economical Administration of Health Insurance Benefits, Studies and Reports, Series M (Social Insurance) No. 15, International Labour Office, Geneva, 1938.*

control of excessive treatment and prescribing, are a complete answer to those who say that there is no restriction by lay authorities of the practice of medicine under insurance. Nearly every country provides for elaborate pricing and statistical compilation of the cost of prescriptions to establish a median or average cost for each prescription. Any physician who exceeds this cost in any considerable manner is warned and, if he does not conform, is punished. Governments and insurance carriers maintain extensive and costly systems of supervising physicians and "sick visitors" to check the work of the insurance physician

and to see that he does not spend too much in treatment. Everywhere the emphasis is on cost rather than on quality of medical care.

The effect of all this on a physician cannot but be to compel him to keep constantly in the forefront of his mind not the principles of the best medical diagnosis and treatment but the "principle of economy." He knows that his professional reputation and livelihood will be destroyed if he oversteps the economy principles much more quickly than if he violates the principles of proper diagnosis and adequate treatment.

OFFICIAL NOTES

RADIO BROADCASTS

The radio broadcasts by the American Medical Association and the National Broadcasting Company, under the title *Your Health*, continue as previously announced each Wednesday over the Blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 o'clock mountain time, 11 a. m. Pacific time).

Starting April 30, daylight saving time takes effect in Chicago. The program will therefore be broadcast at the same hour Chicago daylight saving time, which means one hour earlier central standard time, two hours earlier mountain time and three hours earlier Pacific time. In communities where daylight saving time is in effect there will be no change in the hour of the broadcast.

Owing to network conflicts the Chicago broadcast does not occur at 1 o'clock Wednesday but there is a rebroadcast from a recording over station WENR at 8 o'clock each Monday evening, on and after May 1 (8 o'clock Chicago daylight

saving time, 7 o'clock central standard time). The program broadcast each Monday is identical with the network program of the preceding Wednesday.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

- May 3. Healthier Mothers.
- May 10. The Doctor's Workshop.
- May 17. Healthier Babies.

THE ST. LOUIS SESSION

Dinner to Women Physicians

A Library Dinner will be given Monday, May 15, at 6:30 p. m. in the Tower Room at the Congress Hotel, St. Louis, at which the visiting women physicians will be the guests of the Committee on Women Physicians of the Local Committee on Arrangements, members of which will act as hostesses. Dr. Bertha Van Hoosen, Chicago, will be chairman.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 835 has passed the Senate, providing compensation for disability or death resulting from injury to employees of contractors on public buildings and public works. S. 1265 and S. 2203 have been reported to the Senate, proposing among other things to add a new title to the Social Security Act whereunder an appropriation of \$125,000,000 is authorized for the fiscal year ending June 30, 1941, and thereafter for each fiscal year such sum as may be necessary to enable the states to furnish financial assistance to needy handicapped individuals, defined to mean individuals not eligible for assistance through state plans approved under the titles of the Social Security Act providing for old-age assistance, aid to dependent children and aid to the blind, and who, by reason of physical or mental disability other than disability arising out of impairment of vision, are unable to perform substantial gainful employment. S. 1540 has passed the Senate, proposing to adjust the compensation of the members of the National Advisory Health Council not in the regular employment of the government. S. 1899 has passed the Senate, providing for the detail of a commissioned medical officer of the United States Public Health Service to serve as Assistant to the Surgeon General. H. R. 1776 has passed the Senate, providing for the assignment of medical officers of the United States Public Health Service for duty on vessels of the Coast and Geodetic Survey. H. R. 2296 has passed the House, proposing to restore certain benefits to World War veterans suffering from paralysis, paresis or blindness, or who are helpless or bedridden. H. R. 2320 has passed the House, providing domiciliary care, medical and hospital treatment and burial benefits to certain veterans of the Spanish-American War, the Philippine Insurrection and the Boxer Rebellion. H. R. 2987 has been reported to the House, with recommendation that it pass, proposing to authorize the Veterans' Administration to make payments to nonmilitary employees who donate blood for transfusions for veterans hospitalized in veterans' hospital facilities. H. R. 3537 has passed the Senate, with amendments, to extend the facilities of the

United States Public Health Service to active officers of the Foreign Service of the United States. H. R. 5379 was defeated in the House April 20 by a vote of 234 to 118, proposing to exempt Dr. Nathan Tucker's Asthma Specific from certain labeling requirements of the Federal Food, Drug and Cosmetic Act. H. R. 5762, introduced by Representative Lea, California, has passed the House, with amendment, proposing, among other things, to postpone from June 25, 1939, to Jan. 1, 1940, the effective date of certain of the provisions of the Federal Food, Drug and Cosmetic Act that have not already gone into effect, relating principally to labeling requirements for foods, drugs, devices and cosmetics and the use of coal-tar dyes in foods, drugs and cosmetics. The bill proposes also to authorize the Secretary of Agriculture to postpone, but not beyond July 1, 1940, the effective date of certain labeling requirements of the act so far as they may be applicable to labeling which was lithographed, etched, stamped, printed or otherwise manufactured prior to Feb. 1, 1939, and which would have complied with the Food and Drugs Act of 1906, as amended. The bill also proposes to amend section 502(d) of the Federal Food, Drug and Cosmetic Act so as to require the labels of drugs containing any narcotic or hypnotic substances to state only the "name and quantity or proportion" rather than the "name, quantity, and percentage" of such substances.

Bills Introduced.—H. R. 5691, introduced by Representative Sutphin, New Jersey, proposes to amend the Federal Emergency Relief Act of 1933 for continuation of the civil works program by eliminating the requirement that an injury sustained by an employee must be of traumatic origin to entitle the employee to compensation, including medical and hospital benefits. H. R. 5841, introduced by Representative Patrick, Alabama, proposes to amend the Social Security Act by adding a new title thereto under which an appropriation of \$1,000,000 will be authorized for the fiscal year ending July 1, 1940, and thereafter such sum as may be necessary, to enable the states to aid in restoration of sight to the blind by furnishing hospitalization and medical and surgical aid. H. R. 5870, introduced by Representative Angell, Oregon, proposes to authorize such federal sums as

may be necessary to pay an annuity at a rate not to exceed \$50 a month to blind persons whose annual income from sources other than annuities payable under the act is less than \$1,200. H. R. 5874, introduced by Representative McKeough, Illinois, proposes to include the name of Gustaf E. Lambert among those honored by an act recognizing the high public service rendered by Major Walter Reed and those associated with him in the discovery of the cause and means of transmission of yellow fever. H. R. 5884, introduced by Representative Vinson, Georgia, proposes to authorize the President to appoint for temporary service in the Navy 100 acting assistant surgeons, who shall have the rank and compensation of assistant surgeons.

STATE MEDICAL LEGISLATION

California

Bill Introduced.—A. 2795 proposes to prohibit the distribution of serums, vaccines, bacterial cultures and viruses produced other than in a laboratory licensed either by the Department of Health, the United States Public Health Service or the Bureau of Animal Industry of the United States Department of Agriculture. The bill proposes to repeal the law approved June 1, 1935, regulating the production and distribution of serums, vaccines, bacterial cultures and viruses.

Florida

Bills Introduced.—S. 149 and H. 74 propose to authorize the formation of corporations to operate nonprofit service plans whereby hospital care may be provided by the corporations or by hospitals with whom they have contracted to persons subscribing to said plans under contracts which entitle each subscriber to stated hospital care. H. 384 proposes to enact a massage practice act and to establish a board of massage examiners to examine and license persons desiring to practice massage. The bill proposes to define massage as "the use and practice of psychological, Mechanical and Material Health Sciences, to aid in purifying, cleansing and normalizing human tissues, for the preservation of [or] restoration of Health, according to the fundamental principles of anatomy, physiology, and applied Psychology, as may be required. Massage practice employs, among other agencies, Phyto-therapy, Dietetics, Psycho-therapy, Suggesto-therapy, Hydro-therapy, Zone-therapy, Biochemistry, external applications, Electro-therapy, Mechanotherapy, Mechanical and Electrical Appliances, Hygiene, first aid, Sanitation, Heliotherapy, Spinal Manipulation and Manual Bodily Manipulation." S. 211 proposes to require osteopaths to renew their licenses annually with the board of osteopathic examiners and to pay annual renewal fees of \$5. As a condition precedent to annual renewal of a license, the holder thereof must present satisfactory evidence of having attended in the previous year the two day educational program as conducted by the Florida osteopathic association.

Illinois

Bills Introduced.—S. 292 proposes to enact a separate osteopathic practice act and to establish an examining committee composed of five osteopaths to examine and license persons desiring to practice osteopathy. The bill proposes to define osteopathy as "a system of practice of the healing arts in all its branches with therapeutics majoring in manipulation." The bill specifically states, however, that a license to practice osteopathy shall not permit the holder thereof to practice major operative surgery but shall entitle the holder to use the necessary minor therapeutic agents in the conduct of his practice. H. 633 proposes a procedure whereby any two or more contiguous counties may be incorporated as a tuberculosis sanatorium district and may establish and maintain a tuberculosis sanatorium with branches, dispensaries and other auxiliary institutions connected with it. S. 371 proposes to grant to a hospital treating a person injured through the negligence of another a lien on all rights of action, claims, judgments or compromises accruing to the injured person by reason of his injury. The bill proposes, however, that the lien may not exceed one fourth of the sum paid or due to the injured person.

Massachusetts

Bill Introduced.—H. 2151 is a report of the Special Commission on Osteopathy, Chiropractic, Food, Drugs and Poisons, in which, among other things, the commission (1) recommends the adoption of a separate chiropractic practice act and the establishment of an independent board of chiropractic examiners to examine and license applicants for licenses to practice chiropractic and (2) submits legislation embodying those recommendations. The commission recommends that chiropractic be defined as "the science of palpating and adjusting the articulations of the human spinal column" and that licensed chiropractors shall not be permitted to practice obstetrics, or to administer or prescribe drugs or to perform surgical operations with the use of instruments.

Michigan

Bills Introduced.—S. 428 proposes that in the management of any hospital supported wholly or in part from taxes no discrimination shall be made against the practitioners of any school of medicine recognized by the laws of the state and that all such legal practitioners shall have equal privileges in treating patients in the hospital. H. 550 proposes a new workmen's compensation act, which will provide compensation for any injury or disease arising out of and in the course of employment of an employer subject to the act. The employer is required to provide for an injured employee such medical, surgical and other attendance or treatment, nurse and hospital service, medicine, crutches and apparatus for such period as the nature of the injury or the process of recovery may require. An injured workman is to be entitled to select his own physician from a list compiled by the Department of Labor on the recommendation of the medical societies of the various counties. S. 460 proposes to enact a law to regulate the manufacture, distribution and advertising of foods, drugs, devices and cosmetics.

New Jersey

Bill Introduced.—S. 205 proposes to enact a separate chiropractic practice act and to establish a board of chiropractic examiners to examine and license persons desiring to practice chiropractic. The bill proposes to define chiropractic as "the science, art and philosophy of things natural; a system of adjusting the vertebral column and of the tissues adjacent thereto by hand for the removal of nerve interference thereby to eliminate the cause of disease." Licentiatees are also to have the right to prescribe or regulate the dietary, sanitary and hygienic habits of patients.

New York

Bills Introduced.—S. 1848 and A. 2077 propose to enact a law to regulate the manufacture, distribution, advertising and branding of foods and food products. S. 1892 proposes to prohibit the practice of roentgenology except by licensed physicians, dentists and chiropodists, subject, however, to the conditions and limitations of their respective licenses. The bill proposes to define roentgenology as "that method of medical practice in which examination and demonstration of the normal and abnormal structures and parts of the human body are made by the use of roentgen rays." S. 1893 proposes to authorize the board of supervisors in any county to regulate and license the installation and operation of any machinery, equipment or apparatus to be used for the examination or demonstration of any person or thing by means of fluoroscopic exhibition or shadow imagery registered with photographic materials and the use of roentgen rays. S. 1927 proposes that the medical, dental and nursing care or treatment required for relief clients may be given in whole or in part in cash or by order or in kind, under rules and regulations made by the state board of social welfare.

Oklahoma

Bill Introduced.—H. 638 proposes to require licensed osteopaths to register annually on or before July 1 with the secretary of the state board of osteopathic examiners, to pay annual licensing fees of \$2 and to condition the renewal of licenses on the submission of proof that the licentiatees have attended at least two days of the annual educational program conducted by the Oklahoma State Osteopathic Association in the year preceding applications for renewal.

Pennsylvania

Bills Introduced.—S. 503 proposes to require all physicians, clinics and hospitals to report to the secretary of health of the commonwealth the name, age, sex and address of a person in whom is found sex abnormality, sex perversion or sex criminal tendencies. H. 1038 proposes to establish a separate chiropody practice act and to establish a board of chiropody examiners to examine and license persons desiring to practice chiropody. The bill proposes to define chiropody as "the diagnosis of foot ailments and the practice of minor surgery upon the feet limited to those structures of the foot superficial to the inner layer of fascia of the foot, the palliative and mechanical treatment of deformities and functional disturbances of the feet and the making of models of the foot and toes or any one or more of such activities." Chiropody is not to include the right to treat communicable or constitutional diseases of the bones, ligaments or muscles of the feet or any other part of the body or to perform any operation on the bones, ligaments, muscles or tendons of the feet involving the use of any cutting instrument or the right to use any anesthetic other than local. H. 1098 proposes to authorize the organization of nonprofit healing arts service corporations to provide to subscribers healing art services, which the bill defines to mean the general and usual services rendered and the care administered by doctors of medicine, doctors of osteopathy, dentists, registered nurses and registered pharmacists.

Texas

Bill Introduced.—H. 489 proposes to enact a new workmen's compensation act requiring employers to pay stated percentages of their payroll into a monopolistic state compensation fund from which will be paid compensation to workmen suffering accidental injury arising out of and in the course of their

employment or contracting any one or more of some twenty-six enumerated occupational diseases. Workmen injured or disabled are to be furnished reasonable medical aid, hospital service and medicine and other such treatment as may be necessary to effect a cure from their industrial injuries or disabilities. Apparently, however, workmen are not to be allowed to select physicians of their own choice. However, "if the physician, hospital services, medicines, as furnished by the Board [the administrative agency of the fund] shall not be acceptable to the injured workman, he shall have the right to employ or use such services of his own choice, provided that he submit to proper examination by the physician appointed by the Board, at the expense of the Board."

Wisconsin

Bill Introduced.—A. 692 proposes that the provisions of the medical practice act shall not apply "to a total number of fifty medical physicians who may have been engaged in the actual practice of medicine or surgery in Germany, Austria, Czechoslovakia, or Poland" to whom licenses are issued in the manner set forth in the bill. Briefly, the bill proposes that during the year commencing July 1, 1939, any physician residing in the state who within the last ten years may have been engaged in the continuous practice of medicine in the countries noted may have a license issued to him by the board of medical examiners if he files an affidavit concerning his moral and professional character and the extent and nature of his practice in Europe and also presents an affidavit signed by at least two licensed physicians in the state concerning their knowledge of the applicant. The bill proposes that the number of licenses issued shall not exceed fifty for the year indicated and that no more than five such licenses may be issued in any one calendar month.

WOMAN'S AUXILIARY

Arkansas

Mrs. J. B. Crawford, president, auxiliary to the state medical society, and Dr. George V. Lewis, president, Pulaski County Medical Society, spoke at the February meeting of the auxiliary to the Pulaski County Medical Society. Members of the federated clubs of Little Rock were guests.

At the January meeting of the auxiliary to the Bowie and Miller counties medical societies, Mrs. Kirk Mosley spoke on "Doctors' Wives of the Far East." A collection of Chinese articles was on exhibit.

At the February meeting of the auxiliary to the Sebastian County Medical Society Dr. F. G. Krock spoke on cancer control.

California

Mrs. Charles C. Tomlinson, president, auxiliary to the American Medical Association, spoke before the board of directors of the auxiliary to the California Medical Association in San Francisco February 17.

Dr. Walter H. Brown of Stanford University spoke on "Health Service in Scandinavia" at the January meeting of the auxiliary to the Alameda County Medical Association.

More than 300 doctors and their wives attended the social meeting of the auxiliary at the Athens Athletic Club February 15.

At the January meeting of the auxiliary to the Fresno County Medical Association it was reported that *Hygeia* had been placed in beauty parlors, barber shops, schools, public libraries and clubs. Drs. George W. Walker and A. E. Anderson spoke on "Socialized Medicine." At the February meeting, Mrs. Harold G. Trimble, state Hygeia chairman, spoke on "The Value and Purpose of *Hygeia* to the Public." Dr. Elliot Sorsky spoke on "Comparison of Health Conditions in India with Those in America."

The auxiliary to the Orange County Medical Association has voted to renew twelve subscriptions to *Hygeia* and the *Readers Digest* in Braille for blind persons in Orange County.

The auxiliary to the Riverside County Medical Association was addressed by Dr. Frances Keller Harding on "Medicine Down Under," showing a film of the Fiji Islands.

The auxiliary to the Los Angeles Medical Association met at the Orthopedic Hospital, Los Angeles, January 24. Dr. Robert L. Carroll spoke on "The Therapeutic Theatre," an educational activity provided for hospital patients. The guest speaker was Mme. Gosta Dohlman, wife of Professor Dohlman of Lund University of Sweden.

Illinois

Dr. John R. Neal, Springfield, spoke on "Current Legislative Problems" at a meeting of the auxiliary to the Chicago Medical Society February 1.

Pennsylvania

The auxiliary to the Philadelphia County Medical Society held its annual Christmas Bazaar at the County Medical Society Building December 2 for the benefit of its philanthropies. Dr. Rufus S. Reeves, president-elect of the county medical society, was the speaker at the meeting December 13.

Virginia

The auxiliary to the James City-Williamsburg Medical Society met at the home of the president, Mrs. Frederick R. Persons, January 10, when Dr. E. B. Kilby spoke on socialized medicine.

The auxiliary to the Petersburg Medical Society met at the home of the president, Mrs. Allan Barker, January 23, when Mrs. Wright Clarkson gave a book review on the "Life of Rosalie Slaughter Morton," woman surgeon. A linen shower for the Community Hospital was held February 28. The auxiliary is supporting a memorial bed at the Blue Ridge Sanatorium.

Wisconsin

The auxiliary to the Brown-Kewaunee-Door County Medical Society met December 1 in Green Bay. Mr. J. G. Crownhart, secretary of the State Medical Society of Wisconsin, spoke on "Sickness Care for Wisconsin." There were 125 women in attendance.

Mrs. Robert E. Fitzgerald, president of the auxiliary to the State Medical Society of Wisconsin, spoke at a meeting of the auxiliary to the Sheboygan Medical Society at the home of Mrs. Fred Nause Jr. January 11.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Refresher Course.—The division of maternal and child hygiene of the state department of public health sponsored a refresher course in gynecology and obstetrics in Phoenix April 13-15. Dr. Norman F. Miller, professor of obstetrics and gynecology, University of Michigan Medical School, Ann Arbor, was the instructor.

CALIFORNIA

The Lane Lectures.—Dr. Thomas M. Rivers, director, Hospital of the Rockefeller Institute for Medical Research, New York, will deliver the twenty-seventh course of Lane Lectures of Stanford University School of Medicine, San Francisco, May 22-26. The general title for the lectures will be "Viruses and Virus Diseases."

COLORADO

Portrait of Dr. Edward Jackson.—Dr. Edward Jackson, Denver, observed his eighty-third birthday March 30. As a tribute from friends, a portrait is being painted by Alfred J. Wands, which will be exhibited at a special dedication ceremony but will be hung finally in the Wills Eye Hospital, Philadelphia, where Dr. Jackson received his early training. Born in West Goshen, Pa., Dr. Jackson graduated at the University of Pennsylvania School of Medicine in 1878. He practiced in West Chester and Philadelphia, becoming professor of diseases of the eye at the Philadelphia Polyclinic in 1888. He was surgeon to the Wills Eye Hospital from 1890 to 1894 and from 1896 to 1898. He practiced in Denver from 1894 to 1896 and has practiced there since 1898. He was professor of ophthalmology at the University of Colorado School of Medicine from 1905 to 1921; president of the American Board for Ophthalmic Examinations, 1916-1917; president of the Colorado Commission for the Blind, 1925, and editor of the *American Journal of Ophthalmology* from 1918 to 1928.

ILLINOIS

Pneumonia Control Program.—The state department of public health in cooperation with the U. S. Public Health Service recently launched a program to control pneumonia. Aside from the educational aspects of the plan, efforts are being made to standardize and approve existing laboratories. Antipneumococcus serum for the treatment of type-specific pneumonia has been made available to physicians regardless of the financial status of the patient. Therapeutic antipneumococcus horse serum for types I, II, V, VII, IV and VIII are available in certain areas throughout the state; as the program expands other areas will be added to include the whole state. The only requirements necessary for the physician to obtain serum are: That the bacteriologic diagnostic work for his cases of pneumonia be performed in laboratories which meet the minimum requirements of the state department of public health for typing of pneumonia, and that a treatable type of pneumococcal infection is found; that the duration of the disease has not been longer than ninety-six hours; that the proper report on the use of the serum be filled in, and that all unused vials of serum be returned immediately. The original grant from the federal government was \$50,000, of which \$38,000 was for serum. When this sum was expended, the state legislature made an emergency appropriation of \$75,000 for serum.

Chicago

Society News.—The Chicago Gynecological Society was addressed April 21 by Drs. Paul H. Wosika and Chauncey C. Maher on "The Coexistence of Prolapse of the Uterus, Urologic Pathology and Hypertensive Vascular Disease" and Hilliard E. Miller and Edward Perry Thomas, New Orleans, "Strictures of the Cervix."—A symposium on skull fractures will be presented before the North Shore Branch of the Chicago Medical Society May 9 by Drs. Eric Oldberg, Adrien Verbruggen and Harold C. Voris.

KANSAS

State Medical Meeting at Topeka.—The eightieth annual session of the Kansas Medical Society will be held at the Masonic Temple May 1-4 under the presidency of Dr. Noble E. Melencamp, Dodge City. The Shawnee County Medical Society is acting as host. Out of state speakers will include:

Dr. Claude D. Head Jr., Washington, D. C., Supportive Measures in the Treatment of Pneumonia.
Dr. John A. Borghoff, Omaha, Contact Dermatoses.
Dr. Waltham Walters, Rochester, Minn., Conservative Surgery of the Kidney.
Dr. James M. Martin, Dallas, Texas, Radiation Therapy in Malignant Diseases.
Dr. Julius Jensen, St. Louis, Treatment of Congestive Heart Failure.
Dr. Arnold S. Jackson, Madison, Wis., The Injection Treatment of Hernia.
Dr. Avery D. Prangen, Rochester, Minn., The Early Diagnosis and Management of the Cross-Eyed Child.
Dr. William S. Horn, Fort Worth, Texas, Chronic Undulant Fever as a Cause of Neurasthenia.
Dr. Jay A. Myers, Minneapolis, Early Diagnosis of Pulmonary Tuberculosis.
Dr. Joseph L. Baer, Chicago, Obstetrical Hemorrhages.
Dr. Myrie G. Peterman, Milwaukee, Epilepsy in Childhood.
Dr. Roy R. Grinker, Chicago, Newer Knowledge of the Central Vegetative Nervous System.
Dr. Louis J. Birsner, St. Louis, The Applied Surgical Anatomy of the Sinuses.

There will be round table luncheons in which the guest speakers will take part. Dr. Melencamp will deliver his presidential address Tuesday afternoon, following the address of welcome by Dr. William C. Mcnninger, Topeka, president, Shawnee County Medical Society. There will be a stag banquet Monday following the golf and trap shooting tournaments. A luncheon for county society secretaries will be held Wednesday at the Kansas Hotel and all alumni banquets have been planned for Tuesday evening. The annual banquet and dance will be held Wednesday evening when Mr. Robert L. Lund, St. Louis, the guest speaker, will discuss "The Doctor's Stake in Free Enterprise."

KENTUCKY

Lectures on Pediatrics.—A series of lectures on pediatrics will be offered at the Children's Free Hospital, Louisville, beginning April 26 and continuing on Wednesdays until July. The lectures will cover all the principal diseases of children and one hour a day will be given to presentation of interesting cases in the hospital. Dr. Philip F. Barbour is in charge of the course.

Society News.—The Henry County Medical Society was recently reorganized with the following officers: Drs. Walter W. Leslie, New Castle, president; Maurice Bell Jr., Eminence, vice president, and Owen M. Carroll, New Castle, secretary. —Physicians of Carroll, Gallatin and Trimble counties recently organized a tri-county medical society at a meeting in Carrollton with Dr. J. Samuel Brown, Ghent, as president, and Dr. Harold Carl Boylen, Carrollton, as secretary. —Dr. Richard Alexander Bate, Louisville, addressed the Boyd County Medical Association, Ashland, April 4 on "Newer Phases of Practical Endocrinology."

MARYLAND

Dean Lewis Resigns as Professor of Surgery.—Dr. Dean D. Lewis, professor of surgery at Johns Hopkins University School of Medicine, Baltimore, has resigned on account of ill health, it is reported, and will become professor emeritus. Dr. Lewis was born in Kewanee, Ill., in 1874 and graduated at Rush Medical College, Chicago, in 1899. He joined the staff of his alma mater the following year as assistant in anatomy and subsequently served as instructor in surgery, associate professor of surgery and from 1920 to 1924 as professor. He also served in this last capacity at the University of Illinois College of Medicine from January to July 1925, when he went to Johns Hopkins. Dr. Lewis's membership in medical societies includes the American Surgical Association, the American Association of Anatomists, the American Physiological Society, the American Society of Clinical Surgery, the Interurban Surgical Society and the Southern and Western surgical societies. He is an honorary member of the Wisconsin State Medical Society and a member of several foreign surgical societies. During the World War he served as lieutenant colonel and was awarded the Distinguished Service Medal. He is also a member of the Medical Council of the Veterans' Administration. He has been editor-in-chief of the *Archives of Surgery* since its establishment in 1920 and is also editor of a system of surgery. Dr. Lewis has been a member of the House of Delegates of the American Medical

Association, representing the Section on Surgery in 1915, 1916 and 1917. He was also secretary of the Section on Surgery, 1912-1913, and chairman, 1919-1920. In 1933 he was President of the American Medical Association and in 1931 a member of its Council on Medical Education and Hospitals.

MICHIGAN

Symposium on Medical Economics.—The Wayne County Medical Society, Detroit, devoted its meeting at the Detroit Art Institute April 10 to a discussion of medical economics. The speakers were:

Lent D. Upson, Ph.D., *The Economic Causes of Social Unrest.*

Dr. Henry A. Luce, *Comments on the Wagner Bill.*

Mr. William J. Burns, Lansing, *Voluntary Medical Service Insurance.*

Mr. John R. Mannix, *Group Hospital Insurance.*

Society News.—Dr. Richard M. Davison, Chicago, discussed "Surgical Treatment of Pulmonary Tuberculosis, with Special Reference to a Relatively New Procedure—Extrapleural Pneumothorax" before the Kalamazoo Academy of Medicine March 21.—Dr. Lawrence Reynolds, Detroit, discussed "Cystic Disease of the Lungs" before the Jackson County Medical Society March 21.—Dr. Harold M. Teel, Brookline, Mass., addressed the Calhoun County Medical Society, Battle Creek, March 7 on "Use and Abuse of Pituitrin in the Conduction of Labor."

MINNESOTA

The Bell Lecture on Tuberculosis.—Dr. Henry C. Sweany, Chicago, presented the John W. Bell Lecture on tuberculosis before the Hennepin County Medical Society April 3; his subject was "The Tuberculosis Problem Viewed in the Light of Recent Pathologic Studies." The lecture is sponsored by the Hennepin County Tuberculosis Association.

MISSOURI

The Terry Lecture.—Dr. Lewis Hill Weed, professor of anatomy, Johns Hopkins University School of Medicine, Baltimore, will give the first lecture under the Robert J. Terry Lectureship Foundation, Wednesday, May 17, at 4:30 p. m., in the auditorium of the Washington University School of Medicine, Scott and Euclid avenues, St. Louis. His subject will be "Anatomy in the Medical Curriculum." The lecture is open to the public without charge.

NEBRASKA

Society News.—Dr. Peter T. Bohan, Kansas City, Mo., addressed the Omaha-Douglas County Medical Society, Omaha, March 14 on coronary disease.—Drs. Paul M. Bancroft and Archibald R. McIntyre, Omaha, addressed the Lancaster County Medical Society, Lincoln, recently on "Relationship of the Pineal Gland to Sexual Precocity" and "Experimental Work with Vitamins" respectively.

NEW YORK

Society News.—Dr. Perrin H. Long, Baltimore, addressed the Medical Society of the County of Westchester, White Plains, April 18, on "Clinical Use of Sulfanilamide, Sulfapyridine and Allied Compounds."—Dr. John C. McClintock, Albany, addressed the Dutchess County Medical Society, Poughkeepsie, April 12 on "Some Thyroid Problems."—Drs. Paul V. Newland and Adrian S. Taylor, Clifton Springs, addressed the Ontario County Medical Society, Clifton Springs, April 11 on "Diabetic Coma" and "Common Diseases and Injuries of the Hip" respectively.—Dr. William H. Hobbs, Binghamton, addressed the Broome County Medical Society, Binghamton, April 11 on transurethral resection in the treatment of vesical neck interference.—Dr. Louis C. Kress, Buffalo, addressed the Onondaga County Medical Society, Syracuse, April 4 on "The Part of the General Practitioner in the Control of Cancer" and the proposed state plan for cancer control.—Robert Sealock, Ph.D., Rochester, addressed the Jefferson County Medical Society March 9 on "Vitamins from a Functional Viewpoint."

New York City

Society News.—Dr. Morris Fishbein, Chicago, Editor of *THE JOURNAL*, will address the Medical Society of the County of Kings, Brooklyn, May 23 on "Current Aspects of Medical Legislation."

Plans for the Twelfth Graduate Fortnight.—The New York Academy of Medicine announces that its twelfth Graduate Fortnight will be held from October 23 to November 3. The subject this year will be "The Endocrine Glands and Their Disorders." A complete program and registration blank

may be secured by addressing Dr. Mahlon Ashford, The New York Academy of Medicine, 2 East One Hundred and Third Street, New York.

Obstetrics and Infantile Paralysis.—Drs. Samuel Kleinberg and Morris T. Horwitz are conducting at the Hospital for Joint Diseases an investigation of the obstetric difficulties in patients who have had infantile paralysis. The study is being conducted under a grant from the National Foundation for Infantile Paralysis. Physicians who may know of any such cases are asked to communicate with Dr. Kleinberg or Dr. Horwitz, care of the Research Department, Hospital for Joint Diseases, One Hundred Twenty-Third Street and Madison Avenue, New York.

Convalescent Measles Serum Available.—The New York Department of Health directs attention to its service for providing convalescent measles serum to hospitals and physicians. The serum is prepared in the Manhattan Convalescent Serum Laboratory in the health department's William Hallock Park Laboratory from blood obtained from persons recovered from measles. It is proved sterile and Wassermann negative before it is released, its distribution has been licensed and is under the supervision of the U. S. Public Health Service. Because the laboratory is a nonprofit organization, the serum is furnished to hospitals and physicians at cost of production. Further information may be obtained from Dr. William Thalheimer, director of the laboratory, Fifteenth Street and East River.

Health Precautions at World's Fair.—To safeguard the health of visitors at the New York World's Fair, the municipal department of health has established a branch of its activities on the exposition grounds to enforce the special rules of sanitation that have already been set up. A staff of twenty-four physicians, assisted by thirty nurses, will be in attendance at all times. There are seven first aid stations, each to provide a waiting room, surgery, nurses' and physicians' rooms, and wards for men and women. Serious cases will be temporarily hospitalized and transfer made later to outside hospitals by ambulance. The Fair Corporation operates five air-conditioned ambulances and a truck with portable x-ray equipment. The truck is also fitted up as a developing room, making possible immediate roentgenographic diagnosis. A section of pneumatology has been established at the fair, covering a wide range program in this field of the prevention of asphyxial death. Steps have been taken to enforce all regulations pertaining to the examination of food handlers and food establishments and to the disposal of garbage. Under the terms of these regulations, all glasses, cutlery and crockery used in food purveyance anywhere in the fair are required to be properly washed in a solution of soap, soda or other suitable cleansing powder and treated before each use with a final rinse of hot water at 175 F. for a period of one minute, the temperature to be registered by a thermometer. These installations must be equipped with a locking and timing device to guarantee the time required. Food handlers will be examined once a month and a card issued which must be produced on request by health inspectors. Every effort has been made to eliminate all breeding places of mosquitoes and other insects on the fair site.

NORTH CAROLINA

Society News.—Speakers at a meeting of the Catawba Valley Medical Society, Lenoir, March 14, were Drs. Frederick M. Dula, Lenoir, on "Intestinal Obstruction"; Yates S. Palmer, Valdese, "Diagnosis and Treatment of Anal Fissure" and Alfred A. Kent Jr., Granite Falls, "Epidemic of Acute Benign Lymphocytic Meningitis."—Dr. William B. Porter, Richmond, Va., addressed the Wake County Medical Society, Raleigh, March 9 on "Nutritional Deficiencies and Their Relation to the Clinical Course of Heart Disease."—Dr. Maurice Barnes Woodhall, Durham, addressed the Guilford County Medical Society, Greensboro, April 7 on "Intervertebral Disk Displacement: A Common and Remediable Cause for Sciatica and Back Pain."—Dr. Irving Graef, New York, addressed the Buncombe County Medical Society, Asheville, April 3 on "Advances in the Pathology of Renal Disease."

NORTH DAKOTA

State Medical Meeting at Fargo.—The annual meeting of the North Dakota State Medical Association will be held in Fargo at the city auditorium May 8-10. The guest speakers listed on a tentative program include:

Dr. Elmer M. Jones, St. Paul, *Diagnosis and Management of the Surgical Gallbladder.*

Dr. Henry E. Nicholson, Minneapolis, *Problems of Latent and Wassermann-Fast Syphilis; Dermatology for the General Practitioner.*

- Dr. Louis A. Buie, Rochester, Minn., Office and Hospital Management of Ano-Rectal Diseases.
 Dr. Frank J. Hirschboeck, Duluth, Minn., Cardiac Emergencies; Diagnosis and Treatment of Gastrointestinal Hemorrhage.
 Dr. Solon Marx White, Minneapolis, Hypertension.
 Dr. Frederick C. Rodda, Minneapolis, An Approach to Some Common Behavior Problems.

Among the North Dakota physicians who will present papers are:

- Dr. Leonard W. Larson, Bismarck, Medical Legislation.
 Dr. Archibald D. McCannel, Minot, Diagnosis and Treatment of Eye, Ear, Nose and Throat Conditions Which Are of Particular Interest to the General Practitioner.
 Dr. Harry J. Fortin, Fargo, Emergency Orthopedic Problems.
 Dr. George A. Dodds, San Haven, Indication and Technic of Artificial Pneumothorax, Thoracoplasty and Extrapleural Pneumothorax in the Treatment of Pulmonary Tuberculosis.

OHIO

Another Society of Anesthetists.—The Ohio Society of Anesthetists will hold its organization meeting at the Hotel Waldorf, Toledo, May 4, in joint session with the American Society of Anesthetists. The meeting will open with clinics by the Toledo Society of Anesthetists, following which a constitution will be adopted by the state society and the election and installation of officers will take place. The speakers will include:

- Dr. Maurice P. Cooper, Toledo, The Anesthetic Fire and Explosion Hazard.
 Dr. Frederic Schreiber, Detroit, Cerebral Anoxia and Anesthesia.
 Dr. John S. Lundy, Rochester, Minn., Intravenous Anesthesia.
 Dr. Brant B. Sankey, East Cleveland, Combined Inhalation and Spinal Anesthesia.
 Dr. Hubert R. Hathaway and M. Digby, Madison, Wis., A Free Air-Way Below the Larynx.

A business session of the American Society of Anesthetists will be held in the evening.

PENNSYLVANIA

Society News.—Dr. Richard A. Kern, Philadelphia, addressed the Lebanon County Medical Society, Lebanon, April 11 on clinical allergy.—Dr. Ralph M. Tyson, Philadelphia, was the speaker at a meeting of the Washington County Medical Society, Washington, April 12 on "Care of the Newborn Child."—At a meeting of the Cambria County Medical Society, Johnstown, April 13 Dr. Stanley P. Reimann, Philadelphia, gave an address on cancer.—Dr. Joseph H. Barach, Pittsburgh, addressed the Fayette County Medical Society, Uniontown, April 6, on "Simplified Treatment of Diabetes."

Philadelphia

University News.—Dr. Arthur D. Kurtz, who died January 21, left a bequest of \$4,000 to Temple University to endow a scholarship in memory of his son, who died while a student at Temple University High School.

Personal.—Dr. Leopold S. Vaccaro has resigned as medical director of the state workmen's insurance fund, department of labor and industry, to return to private practice.—Friends and co-workers of Dr. John Claxton Gittings gave a dinner in honor of his sixty-fifth birthday March 13 at the Barclay Hotel. Dr. Albert Gracie Mitchell, Cincinnati, was toastmaster and presented to the University of Pennsylvania a portrait of Dr. Gittings, contributed by his friends. Dr. Gittings is William H. Bennett professor of pediatrics at the university, from which he graduated in 1895.—Dr. George W. Miller, Norristown, has been appointed professor of general anatomy in the Temple University School of Dentistry to succeed the late Dr. Addinell Hewson. Dr. Miller was formerly associate in anatomy at Jefferson Medical College and was at one time on the staff of the department of applied anatomy at Temple University School of Medicine.—At the recent Founder's day of Temple University, when awards were presented to alumni for conspicuous service, Dr. James Marsh Alesbury received the medical award.

SOUTH CAROLINA

Colonel Moncrief Appointed Superintendent of Sanatorium.—Col. William H. Moncrief, director of the Army and Navy General Hospital, Hot Springs National Park, Ark., has been appointed superintendent of the South Carolina Tuberculosis Sanatorium, State Park, to succeed Dr. Ernest Cooper, who is retiring after many years' service. Colonel Moncrief will assume the position about May 1, when he is eligible for retirement from the army, according to a newspaper account. A graduate of Southern Medical College, Atlanta, in 1897, Colonel Moncrief served in the Spanish-American War and

after a period of private practice in Atlanta entered the army in 1902. He served overseas in the World War and since 1920 has commanded Fitzsimons, Sternberg, William Beaumont and Walter Reed general hospitals of the army previous to his service at the general hospital in Hot Springs National Park. Dr. Cooper was made the first superintendent of the sanatorium in 1915, when it had sixteen beds in an open pavilion. It now has a capacity of 500 patients. Dr. Cooper was born in North Carolina and graduated from Johns Hopkins University School of Medicine, Baltimore, in 1910.

TEXAS

State Medical Meeting at San Antonio.—The seventy-third annual session of the State Medical Association of Texas will be held at the Gunter Hotel, San Antonio, May 9-11, under the presidency of Dr. Ernst W. Bertner, Houston. Out of state speakers will include:

- Dr. Irvin Abell, Louisville, President of the American Medical Association, Medicine in the Changing Social Order.
 Dr. John Zahorsky, St. Louis, Psychology in Pediatrics.
 Dr. Huhley R. Owen, Philadelphia, What Are the Duties and Responsibilities of the General Practitioner in the Treatment of Fractures? Unrecognized Fractures.
 Dr. Eugene P. Pendergrass, Philadelphia, Irradiation Therapy of Infections.
 Dr. Wiley R. Buffington, New Orleans, Medical Ophthalmology and the General Practitioner.
 Dr. James N. Baker, Montgomery, Ala., A Plea for Greater Unity Between the Medical and Public Health Professions.
 Dr. Charles F. Craig, San Antonio, Modern Treatment of Malaria Infections.
 Dr. Chester S. Keefer, Boston, Diagnosis of the Causes of Obscure Fever.
 Dr. Russell L. Haden, Cleveland, Use of Iron and Liver in the Treatment of Anemia.
 Dr. Hugh H. Young, Baltimore, The Prostate: Medical and Surgical Aspects.
 Dr. Henricus J. Stander, New York, General Considerations of the Toxemias of Pregnancy.

With the Bexar County Medical Society as host, an elaborate program of entertainment has been planned including golf, skeet and trap shoot, alumni banquets and luncheons. Other societies meeting during this time include the Texas Railway and Traumatic Surgical Association, Texas Neurological Society, Texas Association of Medical Anesthetists, Texas Society of Gastro-Enterologists and Proctologists and Texas Dermatological Society. The woman's auxiliary to the State Medical Association of Texas will hold its twenty-first annual session.

WASHINGTON

New Committees of State Society.—The board of trustees of the Washington State Medical Association at a meeting in January created two new committees, one on public relations and one on postgraduate medical education. Dr. Clark C. Goss, Seattle, is chairman of the committee on public relations and the members are Drs. Henry S. Atwood, Yakima; Jo B. Blair, Vancouver; John C. Lyman, Walla Walla; Sydney M. MacLean, Tacoma; Edwin A. Nixon, Seattle, and Otto M. Rott, Spokane. Dr. Homer D. Dudley, Seattle, is chairman of the committee on postgraduate medical education and members are Drs. Donald G. Evans, Richard J. O'Shea and Charles E. Watts, all of Seattle.

GENERAL

Meeting of Chest Physicians.—The American College of Chest Physicians will hold its annual meeting at the Chase Hotel, St. Louis, May 13-14, under the presidency of Dr. Champneys H. Holmes, Atlanta, Ga.

Nu Sigma Nu Luncheon.—The annual Nu Sigma Nu Fraternity alumni luncheon will be held at the Statler Hotel in St. Louis, Wednesday, May 17, during the period of the annual session of the American Medical Association. Additional information may be had from Dr. Drew Luten, 3720 Washington Boulevard, St. Louis.

Dr. Spies Awarded Phillips Medal.—Dr. Tom D. Spies, associate professor of medicine, University of Cincinnati College of Medicine, Cincinnati, was awarded the John Phillips Memorial Medal by the American College of Physicians at its annual meeting in New Orleans March 29. Dr. Spies was given the medal for "outstanding contributions to the science of nutrition and particularly for his studies on the nature and character of pellagra." Dr. Spies graduated at Harvard Medical School in 1928.

Advisory Committee to the Red Cross.—Dr. Livingston Farrand, Brewster, N. Y., has been made chairman of a medical advisory committee to the American Red Cross, it was announced March 15. Other members of the committee are

Drs Thomas Parran, surgeon general, U S Public Health Service, Washington, D C, Waller S Leathers, dean, Vanderbilt University School of Medicine, Nashville, Tenn., David P Barr, professor of medicine, Washington University School of Medicine, St Louis, Martha M Eliot, assistant chief of the Children's Bureau, Washington, D C, Ross T McIntire, surgeon general, U S Navy, Charles R Reynolds, surgeon general, U S Army, and Edwards A Park, pediatrician of Johns Hopkins Hospital, Baltimore

Research in Ophthalmology.—The Association for Research in Ophthalmology, Inc, will hold its tenth annual meeting in St Louis May 16. The following program will be presented:

- Dr Theodore E Sanders, St Louis, Experimental Ocular Hyper sensitivity
- Drs Theodore L Terry, Boston, Julius F Chisholm Jr, Savannah, Ga, and Albert L Schonberg, Cleveland, Studies on Surface Epithelium Invasion of the Anterior Segment of the Eye
- Dr Myrland A Wood, Iowa City, A Study of Methemoglobin-Producing Organisms in Ocular Inflammations
- George K Smelser, Ph D, New York, Relation of Muller's Orbital Muscle to the Pathology of Retrobulbar Tissues Obtained in Experimentally Produced Exophthalmos
- Dr Carl L Burky, Robert Redvers Thompson, Ph D, and Helen D Zepp, A B, Baltimore, Ocular Reactions of Horses and Rabbits Infected with Strains of Brucella Recovered from Horses with Periodic Ophthalmia
- Dr James H Allen, Iowa City, Staphylococcus Conjunctivitis—Experimental Reproduction with Staphylococci
- Louis Julianelle, Ph D, St Louis, An Immunological Study of Trachoma
- Dr Arthur A Knapp, New York, Vitamin D Complex in Myopia, Etiology, Pathology and Treatment

Dr. Stevenson Succeeds Dr. Hincks.—Dr George S Stevenson, New York, director of the division of community clinics of the National Committee for Mental Hygiene, has been appointed medical director to succeed Dr Clarence M Hincks. Dr Hincks has been dividing his time since 1931 between the national committee and the National Committee on Mental Hygiene of Canada and now returns to the latter organization. Dr Stevenson graduated from Johns Hopkins University School of Medicine, Baltimore, in 1919. After graduation he taught psychiatry at Cornell University Medical College, New York, and the University of Minnesota Medical School, Minneapolis, until he joined the National Committee for Mental Hygiene in 1926 as field consultant for the division on community clinics. He became director of the division in 1927. He is active in various organizations for mental hygiene and has been secretary and president of the American Orthopsychiatric Association.

Medical Women's Association Meeting.—The twenty-fourth annual convention of the American Medical Women's Association will be held at the Hotel Jefferson, St Louis, May 12-14. A banquet honoring past presidents of the association will open the session, at which Drs Harriet S Cory and Helen L B Gage, St Louis, will speak on "What Next for Social Hygiene?" and "The Influence of the Autonomic System upon Certain Diseases of the Upper Respiratory Tract," respectively. Other speakers on the program will include:

- Dr Aphrodite M J Hofsonmer, Webster Groves, Mo., Hard of Hearing in the Public Schools
- Dr Lois C Wyatt, Kirkwood, Mo., Meningitis Complicating a Case of Chickenpox
- Dr Ellen S Loeffel, Webster Groves, Mo., Recent Developments in the Endocrine Therapy of Menstrual Disorders
- Dr Mary Alice Townsend DeMotte, Phillipsburg, Kan., Status of Medical Practice in Western Kansas
- Dr Lillian R Smith, Lansing, Mich., Maternity and Child Welfare

At the inaugural banquet Saturday evening Dr Margaret G Smith, St Louis, will discuss "The St Louis Encephalitis" and Dr Nelle S Noble, Des Moines, will present the inaugural address on "Women in Medicine."

The Twenty-Fifth Annual Golf Tournament.—Fifty trophies and prizes will be awarded in the nine events of the twenty-fifth annual tournament of the American Medical Golfing Association at the banquet at Norwood Hills Country Club, St Louis, May 15. To reach the country club drive out Florissant Road to Lucas and Hunt Road, then north to the country club. This is a thirty-six hole competition, beginning at 7:30 a m and 2:30 p m. Only active fellows of the American Medical Golfing Association may compete for prizes. Members should bring their membership cards to the tournament to facilitate registration. The dinner, the green fees for both courses, tournament fee, refreshments, entertainment and prizes are all covered by the \$6 fee. New fellows of the golfing association pay an additional enrollment fee of \$3. All members of the golfing association are cordially invited to attend this silver anniversary of the American Medical Golfing Association. Additional information will be provided by Bill Burns, executive secretary, 2020 Olds Tower, Lansing, Mich.

Association of the History of Medicine.—The fifteenth annual meeting of the American Association of the History of Medicine will be held at the Hotel Chalfonte, Atlantic City, N. J., April 30-May 1, under the presidency of Dr Walter R Steiner, Hartford. The speakers will include:

- Morris C Leikind, Washington, D C, An Episode in the History of Smallpox Vaccination in New Hampshire
- Walton B McDaniel, Ph D, Philadelphia, The Place of the Amateur in the Writing of Medical History
- Dr Howard Dittick, Cleveland, Nursing Cans
- Dr Franklin H Church, Salem, N J, Syphilis of the Center of the Face
- John W Draper, Ph D, Morgantown, W Va, The Old Age of King Lear
- Dr Syvas T Nitus, Detroit, The Hippocratic Oath in Reference to Lithotomy: A New Interpretation, with Historical Notes on Castration
- Dr Iago Galdston, New York, Ideological Basis of Discoveries
- Dr David Riesman, Philadelphia, Clinical Teaching in America with Some Remarks on Early Medical Schools
- Dr Jabez H Elliott, Toronto, John Gilchrist, 1792-1859, A New England Physician in Upper Canada
- Dr George Rosen, Brooklyn, Occupational Diseases of English Seamen During the Seventeenth and Eighteenth Centuries
- Albert Deutsch, New York, Provision for the Sick Poor in Colonial Times
- Dr Robert S Drews, Detroit, The History of the Care of the Sick Poor in Detroit

Dr Steiner will deliver his presidential address Monday evening on "Some of Louis' Distinguished American Pupils" and Dr William G Leaman Jr, Philadelphia, will discuss "Medical History in Clinical Teaching."

Society for Investigative Dermatology.—The second annual meeting of the Society for Investigative Dermatology will be held at the De Soto Hotel, St Louis, May 16. Dr Joseph V Klauder, Philadelphia, will deliver the presidential address, on "Clinical and Experimental Study of Interstitial Keratitis." Other speakers will include:

- Dr Cornelius P Rhoads, New York, The Physiological Disturbance Associated with Premalignant Changes of the Oral Cavity
- Iryn H Blank, Ph D, Boston, μ Measurements on the Surface of Normal Skin
- Dr Matthew Walzer, Brooklyn, Contact Reaction in Atopic Children
- Dr Horton C Hinshaw and W H Feldman, D V M, Rochester, Minn., A Histopathologic Study of the Intracutaneous Tuberculin Reaction in the Human Being
- Dr Carl W Laymon, Minneapolis, Histamine in the Treatment of Urticaria and Atopic Dermatitis
- Dr Joseph Harkavy, New York, Tobacco Skin Reactions and Their Clinical Significance
- Dr Leon Goldman, Cincinnati, Effect of Fever Artificially Induced on the Skin Sensitivity of Guinea Pigs to Turpentine
- Dr Stephen Rothman, Julius M Coon, Ph D, and Mrs Harriet Steinn, Chicago, Studies on Acetylcholine in Patients with Skin Diseases
- Drs George P Vryonis and Hugh J Morgan, Nashville, The Number of Treponema Pallidum in the Superficial Lesions of Human Syphilis
- Dr Joseph M Thuringer, Oklahoma City, Mitotic Index of Palmar and Plantar Epidermis in Response to Stimulation
- Drs Charles W Barnett and George V Kulchar, San Francisco, Experimental Studies on the Salivary Transmission of Syphilis
- Dr P. Arthur Delaney, Chicago, Modern Technical Methods in Cutaneous Histopathology
- Zola K Cooper, Ph D, St Louis, Mitotic Rhythm in Human Epidermis
- Dr Lester W Kimberly, Iowa City, Blood Plasma Bromide Levels in Bromoderma
- Dr Camille Kereszturi, New York, Primary Tuberculosis of the Skin

Eye, Ear, Nose and Throat Session.—The forty-fifth annual meeting of the American Laryngological, Rhinological and Otolological Society will be held at the Drake Hotel, Chicago, May 9-11, under the presidency of Dr Harold I Lillie, Rochester, Minn. A symposium on care of the patient following operations for sepsis of otitic origin will open the scientific session with Drs William E Grove, Milwaukee, Jacob Marion Sutherland, Detroit, and Thomas C Galloway, Evanston, Ill., as the speakers. One session will be devoted to the care of mastoid wounds.

- Dr Marvin F Jones, New York, Following the Complete Mastoid Operation: Sinus Thrombosis and Operations on the Petrous Pyramid
- Dr James Morrissey Smith, New York, Following the Radical Mastoid Operation of the Modified and Standard Types
- Dr Harold G Tobey, Boston, Following Operations on Abscess of the Brain

Speakers in a symposium on final results in operations for chronic suppurative paranasal sinusitis will include:

- Dr Bert E Hempstead, Rochester, Minn., End Results in Intranasal Operations for Maxillary Sinusitis
- Dr Ebenezer Ross Faulkner, New York, End Results of Intranasal Operations on the Ethmoid Frontal and Sphenoid Sinuses
- Dr Samuel Slinger, Chicago, End Results in External Operations on the Maxillary Sinus
- Dr Millard F Arbuckle, St Louis, End Results in External Operations on the Frontal Ethmoid and Sphenoid Sinuses

A symposium on voice defects will include the following:

- Dr James S Greene, New York, Vocal and Verbal Syndromes: Their Rhinological and Laryngological Significance
- Dr Irving Wilson Voorhees, New York, Voice Defects as Related to Hearing Defects
- Dr Chevalier L Jackson, Philadelphia, The Voice After Direct Laryngoscopic Operations, Laryngoscopy and Laryngectomy
- Dr Lyman G Richards, Boston, will also address the meeting on "Cuts and Captions: Five Editorial Years in Retrospect."

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 1, 1939.

A Complete War Time Plan of Hospital Organization

In the great war the principal hospitals of the country were extensively used for the treatment of wounded soldiers. If another European war occurs they will be put to a quite different use. The bombing from the air of crowded cities has made the position of these hospitals dangerous. They will be used as casualty clearing stations for the immediate treatment of numerous civilian casualties which are expected, and the seriously wounded who cannot be discharged will be removed to base hospitals in safer localities. Plans for this purpose have now been worked out in the greatest detail. Thus London has been divided into ten sectors. These contain the great teaching and large municipal hospitals which have the personnel and equipment for dealing with casualties on a large scale. Other hospitals and institutions have adequate accommodation and can be cleared of their normal patients and upgraded to the status of casualty hospitals in time of emergency. From these the injured would be transferred as soon as possible to affiliated casualty base hospitals in outer areas.

FIRST AID POSTS AND MOBILE UNITS

First aid posts are to be established wherever possible and supplemented by mobile units consisting of vehicles carrying equipment and medical personnel. Each unit is to consist of an automobile 8 feet 6 inches long, 5 feet wide and 6 feet high, fitted with cupboards packed with medical and surgical material. A physician and a nurse will travel in this and auxiliary personnel will follow in a car. One physician at least is to attend at every first aid post. An annual fee is to be paid in peace time to physicians in charge of first aid posts in consideration of their supervising the collective training of the auxiliary personnel assigned to the post. In London the land ambulance service will be supplemented by a river service on the Thames from its estuary up to Teddington.

Surgery in Diabetes

In a discussion at the Royal Society of Medicine Dr. H. P. Himsworth said that surgery in diabetes depended on whether the patient could be sent to the operating room with his diabetes balanced. If not, the surgical technic might have to be modified. Knowledge of the blood sugar level was of little value, for it was not correlated with the clinical state. All the necessary information could be obtained from a series of specimens of the urine. The most important chemical sign was ketonuria, for it showed that the diabetes was grossly out of control and the patient not fit for operation. When time was available the preparation of the patient with uncontrolled diabetes differed from the routine balancing in only one respect: he must receive an adequate amount of food from the onset—at least 1,800 calories and from 180 to 200 Gm. of carbohydrate. The dose of insulin should be raised until ketonuria was completely abolished and glycosuria reduced to a minimum. Protamine zinc insulin should not be used unless a long time was available for observation.

For minor operations under local anesthesia with evipal or with tribromethanol in amylene hydrate no special measures were necessary, but a major operation under a volatile anesthetic required special preparation. The meal and insulin next before the operation should be omitted, but two or three hours before 50 Gm. of sugar in lemonade should be given and, as the patient was put on the trolley, 35 units of insulin subcuta-

neously. If he was on protamine zinc insulin and the operation was fixed for the morning, the same preparation should be given without breakfast or protamine zinc insulin. If the operation was in the afternoon he should receive the usual dose of protamine zinc insulin and luncheon should be omitted, but three hours before operation 30 Gm. of sugar should be given and 10 units of insulin as he went to the operating room. Ether produced vomiting, which by interfering with the intake of food might complicate treatment, and chloroform was condemned by authorities. Postoperative dehydration must be avoided and diabetic ketosis averted, the former by administration of dextrose saline solution and water, the latter by administration of insulin. After the operation a patient who could take food by mouth was given sweet lemonade. Every specimen of urine was tested, if there were no ketones, by Benedict's solution; if the precipitate was red the patient should have 20 units of insulin; if yellow, 50; if green, 10. But if there was no precipitate, no insulin. If ketonuria was present, more carbohydrate should be given and 25 units of insulin for each 50 Gm. of sugar. If the patient could not take sugar by mouth during the first twelve hours he should have insulin according to the color schedule. Ketosis should be combated by intravenous dextrose and saline solution, one pint an hour for two or three hours, and, for every 50 Gm. of dextrose, from 30 to 50 units of insulin should be given according to the severity of the ketosis. If after twelve hours dextrose could still not be given by mouth, more dextrose and saline solution should be injected intravenously with 25 units of insulin.

The state of ketonuria determined whether an emergency operation could be undertaken at once. It was usually possible to wait six hours. If much ketosis was still present, 10 per cent dextrose solution could be infused during the operation and afterward until the ketosis disappeared. If during preparation severe glycosuria developed and ketonuria appeared, sepsis was probably present and operation must not be delayed.

James Risien Russell

The death at the age of 75 of James Risien Russell has removed a great neurologist and great teacher. He graduated at Edinburgh in 1886 and took the gold medal at his M.D. examination. He came to London for postgraduate study at St. Thomas's Hospital and after further study at Berlin and Paris became resident medical officer at the National Hospital, Queen Square, the home of British Neurology, then at its zenith. On its staff was a galaxy consisting of Hughlings Jackson, Ferrier, Gowers, Horsley, Beevor and Bastian. Russell was in turn appointed registrar, pathologist, assistant physician and physician. By a succession of original papers published from 1890 to 1900 and his skill as a clinician and teacher, he achieved a standing beside these great British neurologists. These papers included experimental studies on the functions of the cerebellum, its afferent and efferent pathways, the constitution of the brachial and lumbosacral plexuses and the effects of various lesions of the central nervous system on the knee jerk. With James Taylor he made a critical study of the suspension treatment of tabes dorsalis. In 1900 he published with Batten and Collier a classic paper on the disease they termed "subacute combined degeneration of the spinal cord." He pointed out that cerebellar ataxia is a feature of voluntary as opposed to reflex movements. His command of language and clinical acumen attracted crowds to his clinics. It was said of him by the students that he knew all that the other neurologists knew and had something of his own in addition. He was a president of the Neurological Section of the Royal Society of Medicine, corresponding member of the Société de neurologie of Paris and honorary member of the Canadian Medical Association. He contributed many papers to the medical journals and neurologic chapters to Allbutt's System of Medicine, the Encyclopaedia Medica, Quain's Dictionary of Medicine and Gibson's Textbook of Medicine.

PARIS

(From Our Regular Correspondent)

March 25, 1939.

Clinical Versus Biologic Cure of the Avitaminoses

At the February 28 meeting of the Académie de médecine of Paris, Drs. Georges Mouriquand and Jacques Rollet called attention to the necessity of making a distinction between relief of symptoms due to an A or C avitaminosis and cure of the underlying tissue changes which result from such avitaminoses. By the latter is meant the loss of sensibility to a recurrence of the particular avitaminosis. Guinea pigs which have been subjected to a C avitaminosis diet present typical scorbutic lesions as early as the fifteenth day, which increase in severity from that period onward. If the animals are given a strong dose of ascorbic acid toward the twentieth day, all the clinical evidences of the avitaminosis recede rapidly in a few days. From ten to thirty days after apparent cure, no typical scorbutic lesions can be found at necropsy. If the surviving apparently cured animals are again placed on a C avitaminosis diet and other guinea pigs, to be used as controls, are given the same diet, the apparently cured animals show scorbutic lesions between the third and sixth days, whereas the controls present only the typical lesions from the fifteenth day onward. Only after a long period of treatment with ascorbic acid do the animals which show early evidence of recurrence appear to be cured again. This period varies from sixty to eighty days. This persistence of the lesions of C avitaminosis and sensitization in the animals subjected to a second C avitaminosis diet after apparent cure coincides with the persistence of a certain fibrillary condition of the medulla of the bones, and this disappears only when complete neutralization is obtained. Similar results were obtained in rats subjected to A avitaminosis. After use of an A avitaminosis diet, there appears a typical xerophthalmia, which recedes rapidly after carotene is given. If, however, the A avitaminosis diet is given again, the xerophthalmia reappears in ten or fifteen days, whereas in the control animals, which have been given the A avitaminosis diet for the first time, the xerophthalmia appears at about the thirtieth day.

These experimental observations indicate that the apparent clinical cure of patients suffering from A or C avitaminosis is not a real cure. Complete cure depends on the disappearance of sensibility on the part of the tissues. This necessitates a prolonged cure in order to prevent recurrence of symptoms and bring about a state of biologic "neutrality."

Serotherapy of Appendicitis and Perforative Peritonitis

Prof. M. Weinberg of the Pasteur Institute read a paper at the Nov. 29, 1938, meeting of the Académie de médecine in which he warmly recommended the use of an antigangrene and anticolibacillus serum in all cases of acute appendicitis, especially if complicated by peritonitis. This treatment has encountered strong opposition on the part of some of the leading surgeons in Paris because it might encourage the practitioner to await the outcome of the injection of the serum and consequently result in an increased mortality as compared with that of immediate operation in all cases of acute appendicitis. At the February 21, 1939, meeting of the same society, Professor Weinberg answered the criticisms of those who were opposed to such preoperative serotherapy. He stated that he wished to be understood as being in favor of operation in all cases at some period. For patients who were far away from hospitals, for example on islands, in the colonies or on ships at sea, serotherapy was distinctly indicated. In addition, many surgeons preferred to postpone operation, if possible, until an acute attack had subsided. Their patients would be distinctly benefited by preoperative serotherapy directed toward combat-

ing the bacteria most commonly found in appendicitis and appendicular peritonitis. In ten cases studied bacteriologically, the defensive powers of the patient were distinctly increased as a result of serotherapy. Even in cases of immediate operation, serotherapy is indicated in the interval preceding the operation.

In the discussion, Prof. H. Vincent stated that *Bacillus perfringens* was rarely found in cases of appendicitis and even when present did not appear to have any marked pathogenic properties as compared with *Bacillus coli*. If certain surgeons, as Dr. Weinberg claimed, had observed a lower mortality rate following the use of a polyvalent antigangrene and an anticolibacillus serum, the reason for this improvement was not the action of these specific serums. It must be remembered that ordinary horse serum contains a variable quantity of antibodies which act on a large number of bacteria, especially *B. perfringens*, *B. coli* and *Streptococcus faecalis* (enterococcus). But Dr. Vincent supported the contention of Dr. Weinberg that serums which had a specific action on these three groups of bacteria should be used because there were cases in which horse serum alone did not contain sufficient antibodies to combat the toxins of *B. perfringens*, *B. coli* and *Streptococcus faecalis*.

Fiftieth Anniversary of Pasteur Institute of Paris

The Academy of Science started a subscription in 1888 to erect suitable buildings to house the work of Pasteur and his associates. The Pasteur Institute was opened Nov. 14, 1888, and plans had been made to celebrate its fiftieth anniversary last fall. Owing, however, to the disturbed condition of international affairs, the celebration was postponed to March 15 of this year. In the presence of President Lebrun and of Minister of Public Health Rucart, papers were read by Prof. Louis Martin, director of the Pasteur Institute, by Prof. Gaston Ramon of the branch institute at Garches in one of the Paris suburbs, and by the grandson of Louis Pasteur, Prof. Pasteur Vallery-Radot.

Following the reading of these three papers, a gold medal was awarded Dr. Harry Plotz of New York, at present head of one of the laboratories of the Pasteur Institute, for his research work on the virus of various infectious diseases. A gold medal was also awarded Dr. A. Saenz, now of Uruguay, for his work on the bacteriology of tuberculosis. Prof. Louis Martin in his paper reviewed the life of Pasteur, in calling attention to the opposition which he encountered to his pioneer work in bacteriology. The first course in March 1889 was given at the institute by one of Pasteur's assistants, Professor Roux, whose research on diphtheria made his name almost as well known in the scientific world as that of Pasteur. During recent years the activities of the institute have been especially directed toward the study of the viruses of diseases affecting both animals and man.

Professor Ramon first reviewed the work of Roux and Yersin, who discovered the toxin of diphtheria in 1888 and then found a serum which would neutralize this toxin. In the effort to prevent diphtheria, a series of investigations was begun in 1923 by Professor Ramon at the branch Pasteur Institute in one of the suburbs of Paris. The results of fifteen years of application of this method of vaccination against diphtheria by the use of the toxoid was described in the January 21 Paris letter (*THE JOURNAL*, February 25, p. 758). In addition to vaccination against diphtheria, the branch Pasteur Institute under the direction of Professor Ramon has investigated the question of vaccination against tetanus. Both of these toxoids are now employed extensively in the French army.

Prof. Pasteur Vallery-Radot described the organization of branches of the Pasteur Institute in nearly all the French colonies. The first of these was erected in Tunis in 1893 and a little later one was opened in Algiers. Since then, branches

in Morocco, Madagascar, Indo-China and French West Africa have been organized. Important contributions to our knowledge of various tropical diseases have been published, so that the result of the work of these branch institutes has been a marked reduction in the incidence and mortality of tropical diseases in the French colonies.

BERLIN

(From Our Regular Correspondent)

March 13, 1939.

Infectious Diseases During 1938

Twenty-two infectious diseases are compulsorily reportable under the new law. The promptitude with which most cases are reported to the health officers has made possible the early release of rather complete statistics for the year 1938.

Diphtheria again occupied first place among infectious diseases, as it has done for many years; 149,424 cases were reported. Despite the intensive antidiphtheria campaign the disease has yet to lose its epidemic character. Since children are chiefly affected, diphtheria also ranks as the most prevalent of any disease of childhood. Second to diphtheria was scarlatina, with 114,423 cases. Unlike diphtheria, scarlatina had decreased by several thousand cases as compared with 1937. Fewer new cases of tuberculosis of the lungs were reported than in the previous year (60,420 cases in 1938, 63,570 in 1937). The authors of the report emphasized, however, that a general decline in tuberculosis should not be assumed.

In contrast to the foregoing three principal infectious diseases the others appear numerically insignificant, yet if the seriousness of these less common diseases is considered their importance becomes manifest. Lupus remained virtually unchanged, 1,039 cases against 1,042 in the year 1937. On the contrary, several hundred more cases of encephalitis were reported than in 1937, bringing the total to 1,826. New cases of other infectious diseases were reported as follows: meningitis 287, poliomyelitis 5,757, typhoid 2,945, paratyphoid 3,210, dysentery 5,265, puerperal fever 2,991, febrile abortion 2,862, bite wounds inflicted by rabid animals 112, anthrax eighty-four, psittacosis thirty-seven, trichinosis twenty, malaria 365 (malaria has been compulsorily reportable since January 1), leprosy one case, in the port of Hamburg. The 1938 report mentions no cases of cholera, typhus, yellow fever, plague, variola, relapsing fever or glanders. All the foregoing have to do only with new cases. No statistics from Austria and the Sudetenland are included.

The mortality from the various disorders reflects their relative severity. In 1938 tuberculosis of the lungs caused the greatest number of deaths, 30,623. This figure is equal to numerically more than half the number of newly reported cases of the same disease. One could scarcely adduce better statistical evidence of the peril of tuberculosis than these proportional figures. In 1937, 33,236 persons died of pulmonary tuberculosis. (The tuberculosis deaths occurring in 1938 do not, of course, represent cases newly reported in that year but cases from the aggregate of tuberculous persons.) Conversely, despite the high morbidity of diphtheria there were only 5,286 deaths from that disease. This figure is even smaller than that for the year 1937, although more cases were reported in 1938. This decline in fatalities was probably due to improved treatment and diminished severity of diphtheria. Even smaller was the scarlatina mortality, 759 deaths in 114,243 cases. Among 1,826 cases of lethargic encephalitis there were 842 deaths, most of the victims being children; among 287 cases of meningitis there were 160 deaths; among 5,757 cases of typhoid, 338 deaths. Other fatalities included paratyphoid 126 deaths, dysentery 161 deaths, puerperal fever 548 deaths, febrile abortion 344 deaths, bite wounds twelve deaths, psittacosis six

deaths. In general, with the exception of encephalitis, poliomyelitis, typhoid, paratyphoid and anthrax a recession in the number of fatal cases of infectious disease took place during 1938.

The "House of Health"

The national chamber of physicians in collaboration with various other officials has established a hospital on the shores of the Starnberger See near Munich, which is considered a model for all German hospitals of the future. This institution has been equipped along the lines of "new German medicine" as practiced at the Rudolf Hess Hospital, Dresden. The layout includes common dining halls, a promenade adjoining the baths, bordered by outdoor bathing pools in the kneippist tradition, lounging halls for summer and winter treatment and a spacious gymnasium. The building is surrounded by a huge park in which are facilities for individual physical exercise and for games, including a sort of common recreation area for men and women. The *raison d'être* of all these innovations is, as officially stated, a physical and mental rehabilitation of the patients, to supplement the usual hospital care. The new system will above all be directed to prevention of "diseases of civilization." The following considerations motivated foundation of the new institution: Hospital routines have heretofore been based too exclusively on the care of the patient. This has tended to make a patient "soft" and easily susceptible to psychic disturbances. Accordingly, the new establishment attempts a comprehensive program of rehabilitation which looks beyond the mere curative goal and which is designed to awaken and strengthen against the future the natural forces of resistance both physical and mental. Hence for this institution "for the cure and prevention of sickness" the name "house of health" (*gesundungshaus*) has been selected as more appropriate than the usual term "hospital" (*krankenhaus*).

ITALY

(From Our Regular Correspondent)

Feb. 28, 1939.

National Congress of Pediatricians

The Società Italiana di Pediatria recently held its sixteenth national congress at the University of Genoa.

The first topic was "Meningitis with Clear Cerebrospinal Fluid in Children." Tuberculous meningitis was excluded. Professor Taccone said that meningitis with clear cerebrospinal fluid may be primary or secondary and of bacterial or non-bacterial origin. Meningitis from a neurotropic virus and of physical, chemical or unknown origin is primary nonbacterial meningitis. The forms which develop in the course of bacterial infections from the direct or indirect action of bacteria are secondary bacterial forms, whereas those which complicate nonbacterial infections (such as so-called sympathetic meningitis and those from exogenic intoxication, anaphylaxis and the like) are secondary nonbacterial forms. Primary serous meningitis with clear cerebrospinal fluid is benign. Clinical meningeal symptoms with more or less transient and extensive paralysis are frequently caused by poliomyelitis. Meningitis from epidemic encephalitis is rare. In latent tuberculous meningitis, meningeal symptoms do not develop. The cerebrospinal fluid shows neither chemical nor cytologic changes, but it contains tubercle bacilli. In the course of benign lymphocytic acute meningitis the cerebrospinal fluid is altered. The speaker disapproved of the tendency to diagnose benign lymphocytic meningitis in the case of meningeal reactions with cerebrospinal fluid changes from which the patient recovers. The condition may be a reaction to various diseases, especially in relation to seasonal influences. The existence of a virus for benign lymphocytic meningitis has not been proved, and the autonomy of the form is as yet hypothetical. In meningitis with clear cerebrospinal fluid there are albuminosis and lymphocytosis of the cerebrospinal fluid.

Professor De Simone, the second speaker, said that secondary meningitis, bacterial or nonbacterial, may develop in the course of or at the end of certain diseases. Probably this form represents special humoral reactions of the patient or a diminished virulence of bacteria in the given infection. There are several forms of meningococcic meningitis. In the fulminant form the cerebrospinal fluid may be slightly altered because of the rapidly fatal evolution. Some forms of meningitis, including benign lymphocytic meningitis, may be due to an attenuated meningococcic infection. Other forms of secondary bacterial meningitis are those from icterohemorrhagic spirochetosis and from syphilis. The latter may develop with secondary syphilis or after administration of insufficient treatment. The speaker discussed also meningitis from trauma, sun stroke, heat stroke, simple lumbar puncture, introduction of foreign substances into the spinal canal and local anaphylactic reactions. Frequently the symptoms are not proportional to the changes in the cerebrospinal fluid.

NUTRITIONAL DISEASES IN INFANTS

The second topic was "Acute Nutritional Diseases in Infants." Professor Barberi discussed the etiology and pathogenesis of diseases of the digestive tract in infants. Infection is an important factor. Constitution plays a part because of the individual needs and assimilation by infants of certain constituents of food. Exudative diatheses are predisposing factors in the development of gastrointestinal disturbances. The climatic and meteorologic changes of summer also have a role. The administration of colloids or of acidified milk, a diet without any milk, diminution of the intake of milk and administration of greens, fruits and vitamins are of value in preventing acute nutritional disturbances in infants. Milk used in the treatment of nutritional diseases in nurslings must contain a reduced amount of fat, modified casein and a sufficient amount of carbohydrates to compensate for the deficiency of fats and to control intestinal putrefaction.

Professor Moggi pointed out the importance of breast feeding in the prevention of nutritional diseases in nurslings and the advisability of establishing a nursery room in industrial centers in order that working mothers may feed their infants. Placing infants in the homes of nurses does not give satisfactory results. It is advisable to establish periodic consultations with nurses who conduct nurslings' homes and to have legal control of them. The education of mothers about the health of infants is important, especially in the care of nutritional diseases. The courses on puericulture for mothers given every year by the Opera Nazionale per la Maternità e Infanzia and the courses in specialized pediatrics for municipal physicians given by the ministry of internal affairs have given satisfactory results.

A special session of the congress was devoted to the care of illegitimate children. The next congress will meet in Rome.

Annual Congress on Urology

The Società italiana di Urologia recently held its seventeenth national congress in Rome.

Dr. Oberholzer of Rome spoke on the first topic, "Hormones in the Treatment of Hypertrophy of the Prostate." Theoretically two different male hormones are formed by the testicular interstitial cells. Some authors say that the testicle contains cells which produce estrogen, which exists in the normal urine of man. These substances have an effect on the size and structure of the prostate. Those from Sertoli's cells prevent hypertrophy, whereas those from the interstitial cells stimulate it. Estrogen may induce fibro-adenomatous degeneration of the posterior lobes of the prostate. Variations in the volume and structure of the prostate begin when the equilibrium between these substances, especially between androgen and estrogen, is destroyed. In the literature are reports of more than 1,000 cases of endocrine treatment of hyper-

trophy of the prostate. The speaker reported results in a group of 150 patients, of whom 112 were treated with androgen. The remaining patients had either estrogen or a combined treatment of androgen and estrogen. The speaker believes that glandular disturbances are the most plausible cause of prostatic hypertrophy. The treatment with androgen gives satisfactory results in many cases. The general condition of the patient and the renal functions improve, and the vesical residue diminishes or disappears completely. The treatment is valuable after intra-urethral resection to prevent recurrence. It is harmless, has no contraindications and does not interfere with the results of prostatectomy if indicated. Prostatectomy is followed by rapid recovery in patients who have had the endocrine treatment and complications are rare. Such treatment may stop the evolution of prostatic hypertrophy but does not diminish the size of the adenoma.

TRANSPLANTATION OF URETERS

The second topic, "Transplantation of Ureters," was divided into two subtopics. Professor Chiandano discussed "Ureteral Anastomoses and Ureteral Transplantations." He reviewed the operations used in performing uretero-ureteral anastomoses and in transplanting the ureters to the bladder and intestine. The end to end circular suture (Schopf's technic) is the simplest method for ureteral anastomoses. Transplantation of a ureter to the other one has not met with general approval. Cystoneostomy, or transplanting to the bladder the distal end of the ureter, does not give satisfactory results. Anastomosing a ureteral end which is provided with flaps aims to prevent stenosis at the contacting area. The technic is ingenious and stenosis does not follow. However, the best results are obtained from invagination by traction of the bladder with special instruments introduced into the bladder. Implantation of the ureter to the intestine has many advocates. The operation imitates normal conditions more closely than other operations do.

Professor Chiatellino discussed the results of experimental transplantation of the ureters in structures of the urinary tract or in the intestine. He reviewed the literature and concluded that the immediate results of ureteral transplantation have been improved by the advances in technic. Many technical refinements have been resorted to, but the results of the operation depend not only on the technic but on other factors. In further work on the subject it is advisable to take into account the part taken by physiopathologic factors in the evolution of transplanted ureters. After the presentations by the speakers and after the discussions, several other articles were read and discussed.

Marriages

MARION B. O'KELLEY, Leesburg, Fla., to Miss Barbara Davis Hoffman of Washington, D. C., Nov. 4, 1938.

ROBERT BRUCE LOGUE, Atlanta, to Miss Carolyn Frances Clements of Buena Vista in November 1938.

EDWARD CAFFRON KLEIN JR., Newark, N. J., to Miss Regina Shanley of South Orange, February 11.

RAYMOND F. SHEETS, Carthage, Ill., to Mrs. Elva McCallister in Keokuk, Iowa, February 20.

RUSSELL I. WILLIAMS, Creston, Iowa to Miss Carleen Steckelberg of Lincoln, Neb., February 25.

HAROLD WILLIAM SCHOON, Sibley, Iowa, to Miss Viola Ross of Doon in Spirit Lake, February 11.

HERMAN FRANK OPPELMAN to Miss Gwendolyn Ann Lewis, both of Richmond, Va., January 7.

DEAN WRIGHT SMITH to Miss Dorothy C. Clark, both of Jackson, Mich., February 18.

VIRGIL O. LA FLEUR, Lorain, Ohio, to Miss Gertrude Russell of Chicago, Nov. 10, 1938.

ROSS M. ZELLER to Miss Shirley Burroughs, both of Greenville, Ohio, in January.

Deaths

Henry Schmitz * Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1897; American College of Medicine and Surgery, Chicago, 1906; professor and head of the department of obstetrics and gynecology, Loyola University School of Medicine; past president of the Chicago Gynecological Society; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Central Association of Obstetricians and Gynecologists, Radiological Society of North America, American College of Radiology and the American Radium Society; fellow of the American College of Surgeons; in 1930 received the gold medal of the Radiological Society of North America for achievement in the science of radiology in its application to diseases of women; in 1938 delivered the Janeway Lecture at the annual meeting of the American Radium Society, at which time he was presented with the Janeway Medal; head of the radiation therapy department and attending gynecologist, Mercy Hospital; attending gynecologist to the Cook County Hospital; consulting gynecologist to the Misericordia and Holy Cross hospitals since 1925; director of Cancer Research Institute of Chicago since 1928; secretary, board of trustees, Lewis Memorial Maternity Hospital since 1931; author of "Manual of Diseases of Women," 1912; "Handbook of Gynecology," 1915; "The Physics and Biological Principles of Radiation Therapy," 1922; contributed a chapter on "Radiology" in Davis's Gynecology and Obstetrics, 1934; aged 67; died, April 17, of lobar pneumonia.

Allen Deming Lazenby * Baltimore; University of Maryland School of Medicine and College of Physicians and Surgeons, 1916; one of the original members of the Council on Industrial Health of the American Medical Association; was a captain in the M. C., U. S. Army, in 1917 and retired from active duty in 1919 for disability incident to the service; served during the World War; fellow of the American College of Surgeons and the Association of Industrial Physicians and Surgeons; chairman of the Industrial Health Committee of the Medical and Chirurgical Faculty of Maryland; a member of the Medical Committee of the New York World's Fair; a director of the Baltimore Chapter of the American Red Cross; vice president and medical director of the Maryland Casualty Company; aged 45; died, April 18, of cardiovascular renal disease.

Robert Alexander Peterson * Riverside, Calif.; State University of Iowa College of Medicine, Iowa City, 1918; an Associate Fellow of the American Medical Association; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; formerly a medical missionary under the Board of Missions of the Methodist Episcopal Church, stationed at Chengtu, Szechwan, China, where he was professor of otolaryngology and associate in ophthalmology, West China Union University; director of Chengtu Eye, Ear, Nose and Throat Hospital and consulting otolaryngologist to the Hospital for Men and Hospital for Women and Children; aged 46; died, January 27.

Angenette Parry * Huntington, N. Y.; Woman's Medical College of the New York Infirmary for Women and Children, 1891; past president of the Medical Women's National Association; member of the executive board of the American Women's Hospitals; was decorated by the Greek government in recognition of service rendered sick and destitute refugees at the American Women's Hospitals, Kokinia, Piraeus, Greece; fellow of the American College of Surgeons; aged 81; volunteer worker in the social service department, Massachusetts General Hospital, Boston, where she died, March 1, of cerebral hemorrhage.

James Morsell Gassaway * Senior Surgeon, U. S. Public Health Service, Cairo, Ill.; Columbian College Medical Department, Washington, D. C., 1872; Jefferson Medical College of Philadelphia, 1882; in 1876 was commissioned assistant surgeon in what was then known as the United States Marine Hospital Service; rose through the various positions to that of senior surgeon, which appointment he received in 1912; retired in 1917; past president of the Alexander County Medical Society; aged 91; died, March 5, of chronic myocarditis and cerebral arteriosclerosis.

Thomas Leo Houlton, Omaha; Creighton University School of Medicine, Omaha, 1920; assistant professor of neurology at his alma mater; member of the American Psychiatric Association; on the staffs of the Douglas County Hospital, St. Joseph's Hospital and St. Catherine's Hospital; aged 44; was found dead in his garage, February 1, of accidental carbon monoxide poisoning due to the exhaust from an automobile.

Charles Butterfield Rogers, Columbus, Ohio; Miami Medical College, Cincinnati, 1897; member of the American Psychiatric Association; formerly medical director of the Orchard Springs Sanatorium, Dayton; at one time chief, bureau of examination and classification, Ohio State Welfare Department; aged 65; died, January 27, in the White Cross Hospital of heart disease.

Alfred Frederick William Sferra * Bound Brook, N. J.; St. Louis University School of Medicine, 1929; past president and secretary of the Somerset County Medical Society; formerly county coroner; on the staffs of St. Peter's Hospital, New Brunswick, Somerset Hospital, Somerville, and Muhlenberg Hospital, Plainfield; aged 45; died, January 1, of coronary thrombosis.

Walden Evermont Muns, Birmingham, Ala.; University and Bellevue Hospital Medical College, New York, 1914; formerly assistant professor of clinical medicine, New York Post-Graduate Medical School, Columbia University, New York; aged 54; died, January 31, in the Veterans Administration Facility, Tuscaloosa, of arteriosclerosis, hypertension, nephritis and urcemia.

Ernst Freund, Los Angeles; Medizinische Fakultät der Universität Wien, Austria, 1926; associate professor of orthopedics, College of Medical Evangelists; member of the American Academy of Orthopedic Surgeons; fellow of the American College of Surgeons; on the staffs of the Cedars of Lebanon Hospital and White Memorial Hospital; aged 36; died, Dec. 12, 1938.

Arthur Lemuel Kennedy, Denver; Harvard University Medical School, Boston, 1901; member of the Colorado State Medical Society; assistant professor of clinical medicine and therapeutics, University of Colorado School of Medicine, 1905-1907, and assistant professor of medicine, 1907-1910; aged 72; died, January 4, in La Jolla, Calif., of bronchopneumonia.

Harris Dana Newkirk * Anaheim, Calif.; University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1903; fellow of American College of Surgeons; served during the World War; on the staffs of the Orange County Hospital and St. Joseph Hospital, Orange, and Fullerton (Calif.) Hospital; aged 60; died, Dec. 31, 1938.

James Otho Parramore, Crown Point, Ind.; Medical College of Virginia, Richmond, 1914; member of the Indiana State Medical Association; served during the World War; fellow of the American College of Physicians; medical director and superintendent of the Lake County Tuberculosis Sanatorium; aged 49; died, January 24, of brain tumor.

Lawrence Lloyd Purifoy * El Dorado, Ark.; Memphis (Tenn.) Hospital Medical College, 1903; Tulane University of Louisiana School of Medicine, New Orleans, 1913; fellow of the American College of Surgeons; chief of surgical staff, Henry C. Rosamond Hospital; aged 56; died, January 7, of injuries received in an automobile accident.

Washington Price Timmerman, Batesburg, S. C.; Medical College of the State of South Carolina, Charleston, 1891; member and past president of the South Carolina Medical Association; at one time mayor and member of the board of trustees of the schools of Batesburg; aged 69; died, Dec. 24, 1938, in a hospital at Columbia.

Alexander Scanlin Ross * Camden, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1900; fellow of the American College of Surgeons; surgeon to the Cooper Hospital and the Zurbrugg Memorial Hospital, Riverside; aged 62; died, January 11, of myocardial insufficiency and lobar pneumonia.

Stanley E. Bryant, Dowagiac, Mich.; Michigan College of Medicine and Surgery, Detroit, 1905; member of the Michigan State Medical Society; county coroner; at various times city health officer and member of the city board of health; aged 66; on the staff of the Lee Memorial Hospital, where he died, Dec. 28, 1938.

Archibald A. McLaurin, Pierre, S. D.; Rush Medical College, Chicago, 1911; member of the South Dakota State Medical Association and the Radiological Society of North America; on the staff of the Pierre Indian School Hospital; aged 62; died, January 5, of myxosarcoma testis with metastases.

William E. A. Forde, Nashville, Tenn.; McHarry Medical College, Nashville, Tenn., 1914; professor of otolaryngology at his alma mater; on the attending staff of the George W. Hubbard Hospital, where he was in charge of the otolaryngology service; aged 54; was shot and killed by a student in January.

William Alger Shaw * Reno, Nev.; Jefferson Medical College of Philadelphia, 1911; member of the American Academy of Pediatrics; served during the World War; on the staffs

of St. Mary's and Washoe General hospitals; aged 50; was found dead, January 20, of a self-inflicted bullet wound.

Daniel Louis Scanlan * Volga, S. D.; Minneapolis College of Physicians and Surgeons, 1899; past president of the South Dakota State Medical Association; medical superintendent of the Volga Hospital; fellow of the American College of Surgeons; aged 66; died in March of cerebral hemorrhage.

Russell Wesley Raynor * Pikeville, Ky.; University of Maryland School of Medicine, Baltimore, 1908; formerly acting assistant surgeon in the U. S. Public Health Service; on the staffs of the Beaver Valley Hospital, Martin, and the Methodist Hospital; aged 52; died, January 20, of pneumonia.

Peter Leo McKallagat, Lawrence, Mass.; Columbia University College of Physicians and Surgeons, 1906; member of the Massachusetts Medical Society; formerly city physician, and member of the board of health; aged 55; died, January 19, in Miami Beach, Fla., of coronary occlusion.

John Monroe McSparin, Carriers Mills, Ill.; Loyola University School of Medicine, Chicago, 1916; served during the World War; for many years member of the board of education; aged 49; died, January 7, of chronic myocarditis, nephritis, hypertension and pulmonary tuberculosis.

George C. Nix, Opp, Ala.; University of Texas School of Medicine, Galveston, 1904; member of the Medical Association of the State of Alabama; at one time member of the board of education; formerly county health officer and postmaster; aged 60; died in January of pneumonia.

Theophilus E. Hinshaw, Winfield, Kan.; Missouri Medical College, St. Louis, 1882; member of the Kansas Medical Society; on the staff of the State Training School; trustee of the Southwestern College for many years; aged 80; died, Dec. 23, 1938, in St. Mary's Hospital.

Claude Murphy Scarborough * Chicago Heights, Ill.; Northwestern University Medical School, Chicago, 1926; aged 39; on the staffs of St. James Hospital, Chicago Heights and Ingalls Memorial Hospital, Harvey, where he died, January 18, of coronary thrombosis.

Jacob E. K. Morris * Olean, N. Y.; University of Buffalo School of Medicine, 1879; fellow of the American College of Surgeons; aged 82; on the staff of the Olean General Hospital; died, January 23, of chronic nephritis, hypostatic pneumonia and streptococcal sore throat.

Edward Adams Romig, Newberg, Ore.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1877; veteran of the Spanish-American War; aged 86; died, January 26, in the Veterans Administration Facility, Portland, of cerebral hemorrhage.

William Harvey McLean * Lexington, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1920; fellow of the American College of Surgeons; on the staff of the Good Samaritan Hospital; aged 45; died, January 13, of arteriosclerotic heart disease.

Michael Joseph Purcell * Chicago; Chicago College of Medicine and Surgery, 1912; fellow of the American College of Surgeons; on the staffs of St. Joseph's Hospital and the John E. Murphy Hospital; aged 60; died, January 2, of arteriosclerotic heart disease.

Alvin Lebrun Nourse, Anniston, Ala.; Beach Medical Institute, Indianapolis, 1885; Gate City Medical College, Dallas, 1907; member of the Medical Association of the State of Alabama; died, January 12, of pneumonia following fracture of the hip received in a fall.

James Blaine Muncy * Pennington Gap, Va.; Medical College of Virginia, Richmond, 1918; past president and secretary of the Lee County Medical Society; served during the World War; aged 45; died suddenly, January 20, of a self-inflicted wound.

Claude Bernard Calbreath, Hastings, Neb.; Keokuk (Iowa) Medical College, 1898; member of the Nebraska State Medical Association; served during the World War; aged 60; died, January 9, at the Mary Lanning Hospital of carcinoma of the esophagus.

Robert A. Hudson, Islandton, S. C.; Medical College of the State of South Carolina, Charleston, 1909; member of the South Carolina Medical Association; postmaster; aged 52; died, January 21, in the Charles Es-Dorn Hospital, Walterboro, of coronary thrombosis.

George Gill Mulherin, Brownsville, Tenn. (licensed in Tennessee in 1904); member of the Tennessee State Medical Association; aged 60; on the staff of the Haywood County Memorial Hospital, where he died, January 9, of influenza and pneumonia.

Heinrich F. W. Petersen, Dundee, Ill.; College of Physicians and Surgeons of Chicago, 1888; member of the Illinois State Medical Society; aged 84; died, January 30, in a hospital at Elgin of cerebral arteriosclerosis, myocarditis and bronchopneumonia.

Thaddeus Kosciusko Jones, Henrietta, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1898; served during the World War; for many years mayor; county health officer; aged 62; died, January 24, of myocarditis and toxic goiter.

Charles Epley Patterson, Fayette, Ohio; Starling Medical College, Columbus, 1896; member of the Ohio State Medical Association; at various times member of the village council, and mayor; aged 65; died, January 3, of coronary thrombosis.

Henry Kruse, Chicago; Loyola University School of Medicine, Chicago, 1916; member of the Illinois State Medical Society; aged 53; died suddenly, January 7, in the Roseland Community Hospital of cerebral hemorrhage and hypertension.

George Thomas Magraw, Avondale, Pa.; Jefferson Medical College of Philadelphia, 1897; member of the Medical Society of the State of Pennsylvania; served during the World War; aged 71; died, January 9, of cardiovascular renal disease.

William Porter Logue, Williamsport, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1895; member of the Medical Society of the State of Pennsylvania; aged 75; died, January 5, of chronic myocardial fibrosis.

Matthew Joseph Shields, Scranton, Pa.; University of the City of New York Medical Department, 1888; founder of the American Red Cross first aid work; served during the World War; aged 76; died, January 23, of chronic myocarditis.

Theodore Anthony Kreuser, Hines, Ill.; Rush Medical College, Chicago, 1897; member of the Illinois State Medical Society; aged 73; died, January 8, at the Veterans Administration Facility of arteriosclerosis and cardiac hypertrophy.

Andrew Pleasant Bush, Columbia, Tenn.; Jenner Medical College, Chicago, 1913; Kansas City (Mo.) College of Medicine and Surgery, 1920; aged 57; died, January 9, in the Baptist Hospital, Memphis, of myocardial insufficiency.

Freda May Piles Clark, Chambers, Neb.; Hahnemann Medical College and Hospital, Chicago, 1899; aged 65; died, January 27, in the Nicholas Senn Hospital, Omaha, of gastric ulcer, carcinoma and postoperative pneumonia.

Marcus Claude Roberts * Hutchinson, Kan.; Northwestern University Medical School, Chicago, 1906; on the staffs of the Grace Hospital and St. Elizabeth Mercy Hospital; aged 60; died, January 6, of coronary thrombosis.

John Adam Parker, Kansas City, Mo.; Hahnemann Medical College of the Kansas City University, Kansas City, Mo., 1902; Kansas City Hahnemann Medical College, 1906; aged 64; died, January 1, of heart disease.

Louis King, Chicago; St. Louis College of Physicians and Surgeons, 1900; member of the Illinois State Medical Society; aged 63; died, January 9, of hemopericardium, ruptured cardiac infarct and coronary sclerosis.

Raymond Erastus Gaston * Cincinnati; Miami Medical College, Cincinnati, 1905; served during the World War; on the staffs of the Christ and St. Francis hospitals; aged 62; died, January 3, of myocarditis.

Henry P. Kohberger, Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1902; aged 59; on the staff of St. Joseph's Hospital, where he died, January 3, of coronary thrombosis.

Richard Z. Query, Charlotte, N. C.; University College of Medicine, Richmond, 1907; aged 58; died, January 7, in the Presbyterian Hospital of cerebral hemorrhage and hypertensive cardiovascular disease.

Michael Ritter Miley, Beecher, Ill.; Rush Medical College, Chicago, 1896; member of the school board for many years; formerly mayor; aged 80; died in January of arteriosclerosis and heart disease.

Ernest Foucher, Montreal, Que., Canada; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1911; aged 52; died, January 11, of pneumonia.

Justus Sinexon, Philadelphia; Jefferson Medical College of Philadelphia, 1883; formerly on the staff of the Charity, Jefferson and Presbyterian hospitals; aged 77; died, Dec. 27, 1938, of lobar pneumonia.

Frank Morris * Lima, Ohio; Starling Medical College, Columbus, 1892; on the staffs of St. Rita's and Memorial hospitals; aged 70; died, January 25, of myocarditis, coronary disease and uremia.

Robert E. Fivey, Chicago; Albany (N. Y.) Medical College, 1887; medical director of the Globe Insurance Company; aged 73; died, March 11, in the Evangelical Deaconess Hospital.

William Edgar Robertson, Milton, Ont., Canada; University of Toronto Faculty of Medicine, 1900; formerly a medical missionary; aged 59; died, January 15, of heart disease.

William K. Nisbet Ⓢ Earlington, Ky.; University of Louisville (Ky.) Medical Department, 1888; served during the World War; aged 71; died, January 13, of carcinoma of the stomach.

George Ringel, Kansas City, Mo.; University Medical College of Kansas City, Mo., 1901; aged 58; died, January 3, in the Menorah Hospital, of coronary occlusion and arteriosclerosis.

James F. Lewis, Dupont, Ind.; Medical College of Ohio, Cincinnati, 1875; aged 82; died, January 4, of hypostatic pneumonia, hypertrophy of the prostate and epithelioma of the face.

Michael D. Kiely, Archer, Iowa; University of Edinburgh Faculty of Medicine, Scotland, 1885; formerly mayor; aged 78; died, January 9, in Sioux City of coronary disease.

Mark Edward Johnson, Corning, Iowa; Jefferson Medical College of Philadelphia, 1895; member of the Iowa State Medical Society; aged 77; died, January 9, of coronary occlusion.

Robert C. Hutcheson, Elk Falls, Kan.; Kansas City Medical College, 1885; member of the Kansas Medical Society; aged 80; died, January 5, of carcinoma of the stomach and liver.

Margaret Packer Forcee Kuyk Ⓢ Richmond, Va.; Woman's Medical College of Pennsylvania, Philadelphia, 1891; aged 78; died, January 16, of cardiovascular renal disease.

Richard Homer Fitch, Sturgis, S. D.; Washington University School of Medicine, St. Louis, 1937; aged 35; died, January 7, in Sioux City, Iowa, of coronary occlusion.

Charles Andrew Kenner, Omaha; Rush Medical College, Chicago, 1883; aged 77; died, January 23, of bronchopneumonia following an injury received in a fall down the stairs.

Otto James Schwer, St. Louis; Barnes Medical College, St. Louis, 1907; member of the Missouri State Medical Association; aged 68; died, January 9, of diabetes mellitus.

Helen Kirshbaum, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1893; aged 66; died, January 22, in the Mount Sinai Hospital of coronary thrombosis.

Charles Clinton Parker Jr., Ⓢ Boston; Tufts College Medical School, Boston, 1918; served during the World War; aged 45; died in January of illuminating gas poisoning.

Stuart M. Mann, Moyock, N. C.; College of Physicians and Surgeons, Baltimore, 1895; aged 64; died, January 25, in a hospital at Norfolk, Va., of coronary occlusion.

Henry Williams Hall, Winston-Salem, N. C.; Meharry Medical College, Nashville, Tenn., 1918; aged 43; died, January 7, of an incised wound of the throat, self inflicted.

Charles E. Pugh Ⓢ Chicago; Rush Medical College, Chicago, 1891; aged 73; died, January 18, in the Berwyn (Ill.) Hospital of a skull fracture received in a fall.

Seaborn Wesley Owens, Asbland, Ala. (licensed in Alabama in 1887); aged 85; died, January 4, in St. Luke's Hospital at Jacksonville, Fla., of cerebral hemorrhage.

Burtis W. McLean Ⓢ Jenks, Okla.; College of Physicians and Surgeons, Baltimore, 1906; aged 63; died, January 23, of injuries received in an automobile accident.

Charles Mellies, St. Louis; Homeopathic Medical College of Missouri, St. Louis, 1884; aged 79; died, January 31, of arteriosclerosis and coronary thrombosis.

Irvine Leland Nowlan, South Amherst, Mass.; Dartmouth Medical School, Hanover, N. H., 1894; aged 68; died, January 14, in Northampton of arteriosclerosis.

Lee Anderson Richmond, Hamilton, Ont., Canada; University of Toronto Faculty of Medicine, Toronto, 1909; aged 54; died, January 16, of heart disease.

George F. Roby, Minneapolis; Hahnemann Medical College of Philadelphia, 1881; aged 79; died, January 4, in St. Barnabas Hospital of arteriosclerosis.

Walter Preston Perkins, Girvin, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1888; aged 84; died, January 26, of pneumonia.

Paul John Love, Greensboro, N. C.; Eclectic Medical College, Cincinnati, 1922; aged 41; died, January 5, of chronic myocarditis and coronary occlusion.

Willis H. Haviland, Butte, Mont.; New York Homeopathic Medical College and Hospital, New York, 1888; aged 74; died, January 15, of chronic endocarditis.

John M. C. McAllister, Rochelle, Ga.; University of Georgia Medical Department, Augusta, 1902; aged 59; died, January 25, of coronary occlusion.

Benjamin F. Moreland, Shults, Okla.; University of Arkansas School of Medicine, Little Rock, 1912; aged 69; died, January 16, of Hodgkin's disease.

Samuel Marcus Oppenheim, Denver; Denver and Gross College of Medicine, 1904; aged 55; was found dead, January 4, of an overdose of narcotics.

Barney Ellsworth Crosby, Palo Alto, Calif.; University of Oregon Medical School, Portland, 1893; aged 77; died, January 2, of Parkinson's disease.

Louis Hamilton Seth Ⓢ Wittman, Md.; University of Maryland School of Medicine, Baltimore, 1908; aged 55; died, Dec. 25, 1938, of heart disease.

Monroe Hinson Tunnell Ⓢ Bryn Mawr, Pa.; Jefferson Medical College of Philadelphia, 1912; aged 52; died, Dec. 12, 1938, of chronic heart disease.

Thomas John Allen, Tacoma, Wash.; American Medical Missionary College, 1899; aged 69; died, January 1, of coronary occlusion and arteriosclerosis.

Samuel Purdy Ⓢ San Francisco; California Eclectic Medical College, 1900; aged 72; died, Dec. 9, 1938, of heart disease.

George R. Mitchell, Madison, Wis.; Detroit Homeopathic Medical College, 1872; Civil War veteran; aged 90; died, Dec. 31, 1938, of general debility.

Fred Ferdinand Fair, Chicago; Northwestern University Medical School, Chicago, 1905; aged 55; died, Dec. 30, 1938, of cardiovascular renal disease.

Abram Ashley Wilson Ⓢ Davis, Ill.; Northwestern University Medical School, Chicago, 1894; aged 68; died, Dec. 11, 1938, of coronary occlusion.

Gordon Edgar Mordoff, Wilmette, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1907; aged 56; was shot and killed, January 11.

Harry Lyman Grazier, Aliquippa, Pa.; University of Pittsburgh School of Medicine, 1912; aged 54; died, Dec. 23, 1938, of myocarditis and influenza.

Andrew Gilbert Belsheim, Guler, Wash.; State University of Iowa College of Medicine, Iowa City, 1901; aged 64; died, Dec. 21, 1938, of pleurisy.

Harmon L. Pippin, Bristol, Va.; University College of Medicine, Richmond, 1902; aged 60; was killed, January 8, when struck by a train.

Daniel W. Mears, Scranton, Pa.; Jefferson Medical College of Philadelphia, 1885; on the staff of the State Hospital; aged 79; died, Nov. 12, 1938.

Joseph N. Daniels, Milwaukee; Hahnemann Medical College and Hospital, Chicago, 1886; aged 88; died, Dec. 5, 1938, of cerebral hemorrhage.

Eugene G. Lester, Madisonville, Ky.; Meharry Medical College, Nashville, Tenn., 1915; aged 58; died, Dec. 26, 1938, of cardiorenal disease.

Henry Burr Cogswell, New York; Bellevue Hospital Medical College, New York, 1886; aged 77; died, January 5, of coronary thrombosis.

Jerome C. McNees, Ardmore, Okla.; Missouri Medical College, St. Louis, 1885; aged 76; died, Dec. 14, 1938, of carcinoma of the liver.

Henry Joseph Bell, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1892; aged 76; died, Nov. 16, 1938, of angina pectoris.

Frederick Poppe, Pulcifer, Wis. (licensed in Wisconsin in 1899); for many years postmaster; aged 88; died, Dec. 30, 1938, of senility.

James R. Steele, Danville, Ky.; St. Louis College of Physicians and Surgeons, 1893; aged 70; died, Dec. 13, 1938, of heart disease.

Winston Decatur Coates, San Jose, Calif.; California Medical College, San Francisco, 1896; aged 80; died, January 4, of pneumonia.

Willis Henry Faulkner, Garrison, Texas; Maryland Medical College, Baltimore, 1905; aged 67; died in January of pneumonia.

James M. Elliott, Ogden, Utah; Missouri Medical College, St. Louis, 1886; aged 83; died, Dec. 27, 1938, of chronic myocarditis.

Bureau of Investigation

MISBRANDED "PATENT MEDICINES"

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE—The abstracts that follow are given in the briefest possible form. (1) the name of the product, (2) the name of the manufacturer, shipper or consigner, (3) the composition; (4) the type of nostrum, (5) the reason for the charge of misbranding and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration]

Akalyn—Medical Products Co., and Akalyn Co., New Orleans Composition Essentially acetophenetidin (3.2 grains per tablet), sodium salicylate (2 grains per tablet), magnesium oxide, starch, talc and red coloring Misbranded because quantity or proportion of acetophenetidin present was not declared, as required by law, misbranded, further, because fraudulently represented as a remedy for all forms of pain arising from headaches, neuralgia, rheumatism, menstrual troubles, etc.—[N J 27553, January 1938]

Anbesol—Anbesol Co., Newark, N J Composition Essentially alcohol, glycerin, water, benzocaine, menthol, camphor and small amounts of free and combined iodine and a substance resembling carbonic acid Fraudulently represented as producing immediate local anesthesia, killing germs, and promptly relieving pain, abscesses, inflammation, fever, sores, etc.—[N J 27898, April 1938]

Anti-Pain Liniment—Strong, Cobb & Co., Inc., Cleveland Composition Essentially oils of wintergreen eucalyptus and turpentine, in a petrolatum base Fraudulently represented as a remedy for neuralgic pains, rheumatism, sore throat, etc.—[N J 27717, April 1938]

Athlo Ointment and Athlo Tablets—Athlophoros Co., Pomfret Center, Conn Composition Ointment essentially menthol, thymol, camphor, wintergreen, and oils of mustard and turpentine, in an ointment base, tablets, essentially alone, strychnine and compounds of iron, arsenic, mercury and iodine Ointment fraudulently represented as a remedy for inflammations, croup, etc., the tablets as effective in treating indigestion, liver disorders, general debility, gout, stomach trouble and chronic diseases—[N J 27923, April 1938]

Bull's (W H) Quick Pile Relief—W H Bull Medicine Co., Inc., St Louis Composition Essentially pine tar and small amounts of carbolic and tannic acids in a petrolatum base Not antiseptic, as represented Fraudulent therapeutic claims—[N J 27546, January 1938]

Cas-Tro-Ma—Dixie Medicine Co., McMinnville, Tenn Composition Essentially water, glycerin, sodium salicylate, and extracts of laxative plant drugs For stomach troubles, skin headache, cramps, colic, etc Fraudulent therapeutic claims—[N J 27887, April 1938]

Cereal Lactic—Cereal Lactic Co., Woodward, Iowa Examination of different specimens showed they contained viable lactic acid producing bacteria ranging from 370,000 to 2,000,000 per gram of dry material, thus falling far below the professed standard under which the product was sold. Fraudulently represented as an effective treatment of stomach and intestinal disorders, high blood pressure, nervous symptoms, arthritis, neuritis, eczema, etc.—[N J 27548, January 1938]

Clydesdale Ointment—George W Bicknell Co., Pittsburgh Composition Essentially petrolatum, with a small amount of volatile oils including turpentine and a safrol containing oil Fraudulently represented as a cure for hemorrhoids, skin trouble, rheumatism, corns, sore throat, etc.—[N J 27921, April 1938]

Corona Wool Fat Compound—Corona Mfg Co., Kenton, Ohio Composition Essentially hydrous wool fat containing a small amount of common salt, and perfumed with oil of wintergreen Fraudulently represented as a remedy for sores, boils, wounds, etc.—[N J 27720, April 1938]

Count's Kill Germ—Count's Chemical Co., Nashville, Tenn Composition Essentially mineral oil, with small amounts of pine needle oil and water Not an antiseptic or germicide, as represented For rheumatism, asthma, indigestion, bad blood, erysipelas, "piles," etc. Fraudulent therapeutic claims—[N J 27727, April 1938]

Dodds (Dr) Purgolax Tablets—Southwestern Chemical Co., Jonesboro, Ark Composition Essentially phenolphthalein, calomel and laxative plant drugs, such as aloë, coated with chalk, sugar and a pink coloring material Fraudulently represented as a remedy for auto-intoxication, constipation, and certain forms of biliousness—[N J 27568, January 1938]

Duray—Duray Laboratories, Inc., Seattle Composition Essentially borax, with small amounts of boric and carbonic acids, menthol and a blue pigment Fraudulently represented as a remedy for female disorders, an aid to the menopause, and a germicide—[N J 27558, January 1938]

Effervescent Seltzer—Honoroff Laboratories, Inc., Chicago Composition Essentially baking soda, citric and tartaric acids with 1.2 per cent of acetalinid (5 grains per ounce), 2.8 per cent of sodium bromide, and caffeine For stomach disorders and after-effects of excessive eating or drinking Fraudulent therapeutic claims—[N J 27567, January 1938]

Elder Flower Eye Lotion—George B Evans Laboratories, Inc., Philadelphia Composition Essentially a dilute solution of boric acid and common salt, with a small amount of alcohol and lesser quantities of plant extractives including camphor, peppermint, cherry laurel and elder flowers Falsely represented as being essentially elder flower, peppermint, witch hazel, cherry laurel and camphor, fraudulent therapeutic claims—[N J 27884, April 1938]

Elxir Tussinol—Medicinal Research Laboratories, Philadelphia Composition Essentially a solution of gold bromide Fraudulently represented as a remedy for whooping cough and other spasmodic coughs—[N J 27563, January 1938]

Eupraxine Eczema Salve and Eupraxine Wound Salve—Eupraxine Co., Detroit Composition The first named was essentially zinc stearate and boric acid, in petrolatum, and the second was essentially ichthammol and petrolatum Fraudulent therapeutic claims—[N J 27907, April 1938]

Fairey Oil—Fairey Wholesale Drug Co., Inc., Orangeburg S C Composition Essentially oils of wintergreen and turpentine, and a green coloring material Fraudulently represented as a remedy for neuralgia, rheumatism, cramps, insect bites, etc.—[N J 27551, January 1938]

Filkins' (J L) Wonderful Wintergreen—J L Filkins & Co., Yonkers, N Y Composition Essentially potassium iodide (2.5 per cent), alcohol and water, with extracts of plant drugs including colchicum, flavored with wintergreen Fraudulently represented as a remedy for various forms of rheumatism—[N J 27922, April 1938]

Flame Liniment—G F Foster Products Co., St Paul, Minn Composition Essentially a petroleum oil, with small amounts of volatile oils including mustard, wintergreen and cinnamon, colored with a red dye Fraudulently represented to kill pain and relieve rheumatism, stiff neck, lame back and aching joints—[N J 27890, April 1938]

Goody's Headache Powder—Goody's, Inc., Winston Salem, N C Composition Chiefly acetaminid, though each tablet contained less than the 4 grains claimed, hence adulterated Misbranded because falsely represented as safe and reliable, and as containing no narcotics—[N J 27925, April 1938]

Grandma's Dia-Col—Park Laboratory Co., Inc., San Antonio, Texas Composition Essentially extracts of plant drugs, with small amounts of camphor, menthol and red pepper, alcohol (28 per cent by volume), glycerin and water Fraudulently represented as a remedy for colic, diarrhea, cramps, etc.—[N J 27731, April 1938]

Heinrich's Dermo Carbo Salve—Heinrich Chemical Co., Minneapolis Composition Essentially a small amount of carbonic acid in a petrolatum base Fraudulently represented as an effective treatment for sores, cuts and wounds—[N J 27746, April 1938]

Heinrich's Pain-A-Way—Heinrich Chemical Co., Minneapolis Composition Chiefly water, alcohol and oils of mustard and cinnamon Fraudulently represented as a cure for cramp pains, colic, diarrhea, rheumatic pains and aching joints—[N J 27747, April 1938]

Heinrich's Medicated Ointment—Heinrich Chemical Co., Minneapolis Composition Camphor, oil of eucalyptus, and a very small amount of zinc oxide Fraudulently represented as a healing and penetrative treatment for all skin affections and injuries—[N J 27747, April 1938]

Heinrich's Rheumatism Remedy—Heinrich Chemical Co., Minneapolis Composition Essentially a watery alcoholic solution of sodium salicylate, sugar, and a small amount of plant extractives Fraudulent therapeutic claims—[N J 27747, April 1938]

Heinrich's San-I-Cide—Heinrich Co., Minneapolis Composition Alcohol, water, zinc chloride menthol aromatics and traces of formaldehyde Misbranded because alcohol content was not over 26 per cent by volume, whereas labels represented it to be approximately 12 per cent Fraudulently represented as a cure for bleeding gums, sore throat, tonsillitis, wounds, etc.—[N J 27747, April 1938]

Helm's Jen-A-Rub—Helm Co., Benton Harbor, Mich Composition Essentially oil of wintergreen and menthol, in a petrolatum base For chest colds, sinus trouble, sore throat, influenza, pneumonia, neuritis, etc. Fraudulent therapeutic claims—[N J 27566, January 1938]

Hessel's Oil de Vita Salve—Vita Laboratories, Philadelphia Composition About 20 per cent of peppermint oil in an oily base, apparently petrolatum Fraudulently represented to relieve eczema and other skin eruptions, and rheumatism—[N J 27702, April 1938]

Histosan—Histosan Inc., New York Composition Essentially sugar, water, alcohol and small amounts of guricol, ammonium chloride, common salt, Glauber's salt and protein material Fraudulently represented as a remedy for colds and kindred disorders—[N J 27723, April 1938]

Isaac's (Dr) Big Jim—Tampa Drug Co., Tampa, Fla Composition Essentially potassium iodide (52 grains per fluidounce), alcohol, water and plant drug extracts Fraudulently represented to cure impure blood, boils, sores, rheumatism, etc.—[N J 27725, April 1938]

Isaac's (Dr) Big Jim Healing Fluid (or Liquid)—Tampa Drug Co., Tampa, Fla Composition A watery solution containing about 6 per cent of mercuric chloride Fraudulently represented as an efficacious sore wash—[N J 27725, April 1938]

La-Vim—Lewis Laboratories, Inc., Atlanta Composition Essentially plant drugs including a laxative, and nuxvomica, a phosphorus compound, sugar alcohol and water, with cinnamon flavor Fraudulently represented as a "tonic" to correct malnutrition, languor and frailty in persons of all ages—[N J 27573, January 1938]

Little Wonder Page's Inhalers (Cigaretts)—Consolidated Chemical Co., Grand Rapids, Mich Composition Essentially plant material chiefly *tramonium leaves* For asthma, hay fever, catarrh, bronchitis and heart disease Fraudulent therapeutic claims—[N J 27715, April 1938]

Lund's Magic of the Grapo—Lund's Grape Juice Co., Erie, Pa. Not pure grape juice, as represented, as it was diluted and contained added grape sugar. Fraudulently represented as a cure for colds, stomach, liver, kidney, lung and bladder troubles, rheumatism, etc.—[N J 27569, January 1938]

M F C Chilli and Malaria Tonic—Southwestern Chemical Co., Jonesboro, Ark. Composition Essentially sugar, water, cinchonine, phenol phthalein, an iron compound, benzoic acid and extracts of plant materials. Adulterated and misbranded in that it did not contain either quinine or quimidine as presented. "Tonic" Fraudulent therapeutic claims—[N J 27568, January 1938]

Migro-Powder—C J Czarnicki, Detroit. Composition Essentially baking soda and milk sugar, with 43 grains of acetanilid in each powder. Misleadingly labeled as containing 6 grains of acetanilid per powder, fraudulently represented as a remedy for neuralgia and la grippe—[N J 27713, April 1938]

Miller's (Dr) Tonic Prescription—International Research Laboratory, Chicago. Composition Essentially water, sugar, alcohol and extracts of plant drugs, including a laxative one. Fraudulently represented as a system cleanser and a remedy for sick headache, insomnia, stomach ulcers, high blood pressure, rheumatism, anemia, etc.—[N J 27714, April 1938]

Mimein Laxative-Aspirin—Miller Medicals Inc., Indianapolis. Composition Essentially, in each tablet, 1 grain of acetanilid, 140 grain of aspirin, with plant drugs including caffeine, cissampelos and aloin. Misbranded in falsely intimating that the product was chiefly aspirin, and in failing to declare the amount of acetanilid present. Fraudulently represented to possess the efficacy of aspirin—[N J 27719, April 1938]

Monitol Bath Treatment—H A Montgomery Co., Detroit. Composition Essentially water and an ichthammol like material. Fraudulently represented to relieve pains of arthritis, rheumatism, sciatica and lumbago—[N J 27722, April 1938]

Needham's Red Clover Extract—D Needham's Sons, Chicago. Composition Essentially plant materials whose ash was chiefly calcium, magnesium, potassium, sodium and iron phosphates chlorides and sulfates. Fraudulently represented as effective for constipation, abnormal tissue changes, carbuncles, stomach troubles, mouth and throat disorders, etc.—[N J 27743, April 1938]

Odo-Go—National Products Co., Fort Worth, Texas. Composition Essentially sodium carbonate, with a small amount of potassium permanganate. Misbranded because not a disinfectant, antiseptic or germicide, when used as directed. Fraudulently represented as a cure for skin eruptions, dandruff, sore throat, ulcers, etc.—[N J 27878, April 1938]

Oilax Compound Tablets—G Knewitz, East St. Louis, Ill. Composition Essentially phenolphthalein (about 3/4 grain per tablet) and extracts of plant material including aloe, strychnine and croton oil. Fraudulently represented as a tonic and preventive of constipation—[V J 27572, January 1938]

Phillips' Group and Pneumonia Salve—Phillips Products Co., Watertown, Tenn. Composition Essentially oils of eucalyptus and pine, in petrolatum. Fraudulently represented as a cure for chest troubles—[N J 27885, April 1938]

Prieto Tonic—Indiana Laboratory Co., Laredo, Texas. Composition Essentially water, glycerin, alcohol, potassium iodide (about 9 grains per fluidounce), sodium benzoate, and extracts of plant drugs including cinchona. Fraudulently represented as an effective general alterative tonic, aperitif, nerve sedative, blood purifier and remedy for skin diseases, anemia, etc.—[N J 27740, April 1938]

Q E D Mineral Water—Q E D Mineral Water Co., Shakopee, Minn. Composition Essentially water containing sulfur dioxide. Falsely represented as a mineral water or mineral water synthetic, and a new discovery. For use on open wounds, burns, cuts, and as a nose and throat spray for colds and catarrh. Fraudulent therapeutic claims—[N J 27894, April 1938]

Rel-Ka-Sol—Rel Ka Sol Chemical Co., Philadelphia. Composition Essentially water, alcohol, borax and a small amount of carbolic acid. For cuts, burns, abscesses, boils, tonsillitis, blood poison, etc. Fraudulent therapeutic claims—[N J 27892, April 1938]

Reliable Peto Pills—Rel Drug Co. and Reliable Medical Co., Chicago. Composition Brown tablets, essentially compounds of sodium and iron, sulfates, carbonates and aloe, coated with chalk, pink tablets, essentially phenolphthalein and ginger, with sugar and chalk. For menstrual irregularities. Fraudulent therapeutic claims—[N J 27912, April 1938]

Rex Improved Hygienic Powder—Rel Drug Co., and Reliable Medical Co., Chicago. Composition Essentially boric acid (99.2 per cent) and a small amount of thymol. For leucorrhea, gonorrhea, etc. Fraudulent therapeutic claims—[N J 27912, April 1938]

Rex Pep-Tone Pills—Rel Drug Co., and Reliable Medical Co., Chicago. Composition Essentially iron and sodium, sulfates, carbonates and zinc phosphide, coated with chalk. Fraudulently represented as a tonic and blood and nerve builder—[N J 27912, April 1938]

Ru-Ma—Dr Leonhardt Co., Buffalo. Composition Essentially an aqueous solution of iodides, salicylates, acetates and a laxative plant drug. For rheumatoid conditions, gouty diathesis, etc. Fraudulent therapeutic claims—[V J 27739, April 1938]

Sal-I-Can—Dr J L Davis, Irvine, Ill. Composition Essentially salicylic acid, alcohol, acetone and water. Fraudulently represented as an effective treatment for ringworm, infected wounds, tumors, eczema, etc.—[N J 27738, April 1938]

Sharpsteen's (Dr) Hindoo Salve No 16—Drs H & V Sharpsteen, Marshall, Mich. Composition Essentially small amounts of chloroform and volatile oils including sassafras and cloves, in a fatty base. Misbranded because not labeled as to quantity or proportion of chloroform present, fraudulently represented as a remedy for pneumonia, piles, constipation, kidney and liver disorders, eczema, etc.—[N J 27712, April 1938]

Sharpsteen's (Dr) Vegetable Hindoo Oil No 5—Drs H & V Sharpsteen, Marshall, Mich. Composition Essentially saponifiable and volatile oils including those of sassafras, cloves, menthol and camphor, with chloroform (15 per cent by volume). Falsely represented as being wholly a vegetable oil, which it was not, recommended for dyspepsia, gallstones, dropsy, appendicitis, rheumatism, tuberculosis, etc. Fraudulent therapeutic claims—[N J 27712, April 1938]

Sharpsteen's (Dr) Vegetable Tablets Nos 1, 2, 3 and 4—Drs H & V Sharpsteen, Marshall, Mich. Composition "No 1," calcium and ferrous (iron) carbonates, potassium and sodium sulfates, and plant drugs including a strychnine bearing drug and a laxative one, "No 2," magnesium and calcium carbonates and plant drugs, including a strychnine bearing drug and a laxative one, "No 3," ferrous (iron), magnesium and calcium carbonates, and plant drugs, including quinine and a laxative one, "No 4," calcium carbonate and plant drugs, including a laxative one. All fraudulently represented as remedies for stomach liver and blood diseases, different forms of rheumatism, tonsillitis, catarrh, pneumonia, erysipelas, etc.—[N J 27712, April 1938]

Shiloh—S C Wells & Co., LeRoy, N Y. Composition Essentially terpin hydrate, turpentine oil, and volatile oils including peppermint, with chloroform, glycerin and water. Fraudulently represented as a remedy for coughs, angina, croup, and all pulmonary diseases including tuberculosis—[N J 27539, January 1938]

Simba—G F Foster Products Co., St. Paul. Composition A dark turbid, watery alcoholic solution of plant material, epsom salt, sodium salicylate, and an emodin bearing drug. Fraudulently represented as a cure for stomach, liver, kidney and blood disorders caused by constipation, auto-intoxication and improper digestion. Further misbranded in being represented as consisting wholly of roots and herbs—[N J 27749, April 1938]

Si-Noze—Si Noze Products, Chicago. Composition Essentially benzocaine, ephedrine, camphor and menthol, dissolved in a mixture of mineral water and fatty oil. For sinus troubles, hay fever, catarrh, etc. Fraudulent therapeutic claims—[N J 27718, April 1938]

Sitroux-Alds—Sterilak Co., Inc., Utica, N Y. Composition Tissue paper containing small amounts of menthol and essential oils, such as cedar and eucalyptus. For hay fever, sinus disorders, etc. Fraudulent therapeutic claims—[N J 27734, April 1938]

Skoot—Skoot Co., Hamilton, Ohio. Composition Essentially winter green, menthol, water and a gum. For pains of rheumatism, lumbago, pleurisy, headache, congestion, etc. Fraudulent therapeutic claims—[N J 27886, April 1938]

Snipes' Japleura Skin Remedy—Snipes Medicine Co., Little Rock, Ark. Composition Essentially carbolic acid (17 per cent by weight), glycerin, sassafras oil, menthol and salicylic acid. Not a germicide, as represented. Claims for its curative effects were fraudulent—[N J 27395, December 1937]

Snuffly—Vita Laboratories, Philadelphia. Composition Eucalyptus oil. For sinus trouble, asthma, hay fever, etc. Fraudulent therapeutic claims—[N J 27702, April 1938]

Sun-Ray Vita-Lax—Vita Lax Products Co., Birmingham, Ala. Composition Essentially bran, agar agar, psyllium seed yeast and phenol phthalein (about 0.3 grain per average level teaspoonful). Misbranded because represented as a vitamin laxative, whereas it was essentially a phenolphthalein laxative. Fraudulently represented as a remedy for acid indigestion, deficiency diseases, rheumatism, obesity, etc.—[N J 27750, April 1938]

Ter-O-Sul—National Hygienic Corporation, Brooklyn. Composition Essentially starch, sodium bisulfate, baking soda, noncolloidal sulfur (7.4 per cent), and a trace of other inorganic compounds. Misbranded because it contained not more than a trace of colloidal sulfur, if any, and because fraudulently represented as a treatment for arthritis, sciatica, neuritis, gout, skin eruptions, impure blood, etc.—[N J 27742, April 1938]

Trask's Treatment for Constipation—Western Laboratories Inc., Chicago. Composition Essentially plant drugs, phenolphthalein and strychnine, coated with chalk and an iron compound. Fraudulent therapeutic claims—[N J 27910, April 1938]

Trents Eucalyptol Compound—John J. Samuel's, Chicago. Composition Essentially water, sugar, gum and small amounts of eucalyptol and menthol. Fraudulently represented as a cure for throat and lung affections—[N J 27732, April 1938]

Van Ogden Wonderful Liniment—Van Ogden, Inc., Chicago. Composition Essentially small amounts of wintergreen, menthol, red pepper, camphor, chloroform (7 minims per fluid ounce), and mineral oil. Fraudulent therapeutic claims—[N J 27910, April 1938]

Van's Magic Oil—Guy S. Venderlinde, Muskegon, Mich. Composition Essentially volatile oils (10 per cent) including those of camphor and eucalyptol, in a base of linseed oil. Fraudulently represented as a remedy for inflammatory diseases, rheumatism, hemorrhoids, toothache, etc.—[N J 27915, April 1938]

Vapor Balm (Anti-Pain Ointment)—Specialized Laboratory, Buffalo. Composition Essentially oil of wintergreen, menthol and petrolatum. Fraudulently represented as a remedy for colds and other congestions, rheumatism, neuralgia, etc.—[N J 27708, April 1938]

Whitmarsh Blood Elixir.—Whitmarsh Laboratories, Adrian, Mich. Composition: Essentially water, alcohol (10 per cent by volume), a small amount of benzoic acid, and extracts of plant drugs including anise and an alkaloid-bearing drug. For skin poisonings (such as from ivy, oak or sumac), eczema, psoriasis, etc. Fraudulent therapeutic claims.—[N. J. 27741; April 1938.]

World's Wonder Massage.—World's Wonder Medicine Co., Inc., Detroit. Composition: Essentially small amounts of ammonia water, quinine, volatile oils including wintergreen and camphor, with turpentine, alcohol and water. Fraudulently represented as a cure for rheumatism, swollen feet, stiff joints, pneumonia, etc.—[N. J. 27540; January 1938.]

Zomogo Oil.—L. Zomogo Hood, Hot Springs, Ark. Composition: Essentially a mixture of oils, including those of petroleum, eucalyptus, mustard, clove and cinnamon. "Cure-all." Fraudulent therapeutic claims.—[N. J. 27920; April 1938.]

Correspondence

TREATMENT OF DELIRIUM TREMENS

To the Editor:—"The Treatment of Delirium Tremens," a contribution of Bowman, Wortis and Keiser in the April 1 issue of *THE JOURNAL*, is of especial interest to physicians who are meeting patients suffering with delirium tremens. It cannot be doubted that this complication of chronic alcoholism is one of the most difficult conditions met by physicians practicing in both general and psychopathic hospitals. The average physician or nurse is not trained in a large municipal and state institution where any considerable number of alcoholic patients are admitted for treatment. Hence many of these patients, being poorly understood, are improperly treated and the death rate therefore is inordinately high.

A study which I made some years ago revealed that the mortality from delirium tremens varied from 15 to 50 per cent in various hospitals throughout the country. The article to which reference has been made might well have referred to the fact that delirium tremens is a complication of high tolerance alcoholism and that the periodic drinker, unless he persists in maintaining a high saturation of bodily fluids over a period of many days or weeks, is not likely to have this complication. The Saturday night drinker, even though he receives some trauma to the body or head, is not likely to become delirious. The reason for this complication being confined to high tolerance drinkers is ill understood and probably is explained by the various vitamin and hepatic deficiencies described by Bowman, Wortis and Keiser. It would have been highly helpful if these writers had stressed the fact that alcoholic delirium is a condition which under the best of treatment is likely to continue from three to five days and that the surest way to raise the mortality is to endeavor to produce, by means of depressant drugs, a critical sleep from which the patient will awake with a clear mentality. It is probable that a lack of understanding of that fact accounts for the great variance in mortality rates just mentioned, since morphine, chloral and bromides in large doses, and even the barbiturates, are likely to do much harm. Physical therapy with treatment of the acidosis present and with the understanding that the patient will not do well under physical restraint and will continue to be delirious for several days should materially lower the mortality of delirium tremens. A decade and a half spent in a large municipal institution, admitting from 3,000 to 4,000 alcoholic patients annually, has still left some doubt in my mind as to whether rapid withdrawal of alcohol, because of a non-retentive stomach, a loss of ability to purchase a drink or trauma incurred on the street, which hospitalizes the patient, does not play some part in the precipitation of the delirium. During the prodromal period of delirium tremens, i. e. before hallucinosis develops, it will at least do no harm to administer alcohol. After hallucinosis is actually manifest, alcohol certainly should be interdicted.

JOSEPH C. DOANE, M.D., Philadelphia.

REGARDING A HYPOGLYCEMIC FACTOR IN THE DUODENUM

To the Editor:—The correspondence of Dr. Garfield G. Duncan on "The Clinical Application of Duodenal Extract in the Treatment of Diabetes" in *THE JOURNAL*, March 18, commands interest. Since Duncan and his associates (Duncan, G. G.; Shumway, N. P.; Williams, T. L., and Fetter, Ferdinand: *Am. J. M. Sc.* 189:403 [March] 1935) administered their extract by mouth, it is not surprising that interest should attach to their therapy.

The presence of a hypoglycemic factor in crude secretin was recognized almost from the very discovery of secretin by Bayliss and Starling (Bayliss, W. M., and Starling, E. H.: *J. Physiol.* 25:325, 1902). As early as 1906, Moore, Eadie and Abrams reported seemingly good results with the use of hydrochloric acid extracts of the duodenum and upper part of the jejunum in clinical diabetes. Since then a great deal of experimental effort has been spent in isolating this hypoglycemic factor from crude secretin.

Because boiling the duodenal extracts with dilute acids destroys the hypoglycemic effect but leaves the secretin action intact, Dixon and Wadia (Dixon, W. E., and Wadia, J. H.: *Brit. M. J.* 1:820 [May 8-15] 1926) believe that the blood sugar reducing agent is separate from the secretory agent. This view is supported by Lalou (Lalou, S.: *J. de physiol. et de path. gén.* 14:465, 1912), Mellanby (Mellanby, J.: *J. Physiol.* 66:1 [Sept.] 1928) and Heller (Heller, H.: *Arch. f. exper. Path. u. Pharmacol.* 145:343, 1929) because of the rapid destruction of secretin by pepsin and trypsin, which do not affect the hypoglycemic agent. Finally, methods were devised (La Barre, Jean, and Still, E. U.: *Am. J. Physiol.* 91:649 [Jan.] 1930) by which crude secretin could be separated into two fractions: one possessing but little secretagogic but highly hypoglycemic action, the other actively secretagogic and not at all hypoglycemic.

The question then raised was whether the hypoglycemic agent might represent insulin extracted from the duodenum. Heller in 1929, using insulin-extracting methods on beef intestine, found no insulin in mucosa of the upper part of the small intestine. About the same time La Barre and Still, utilizing the fact that insulin is inactivated by pepsin-hydrochloric acid, failed by this method to destroy the hypoglycemic action of crude secretin. On the same basis, the effectiveness of the oral administration of duodenal extracts to lower the blood sugar in diabetic dogs reported by La Barre (*Bull. Acad. roy. de méd. de Belgique* 14:469, 1934) and in diabetic patients by Duncan and his associates speaks against its being merely insulin. Finally, using the method of pancreatico-jugular anastomosis between adrenal-decapsulated dogs, Zunz and La Barre (Zunz, E., and La Barre, Jean: *Comp. rend. Soc. de biol.* 99:335 [June 29] 1928) observed a lowering of blood sugar after the intravenous injection of nonhypotensive secretin in the donor which was much less marked than that in the recipient. This, of course, would not be the expected result if the extract were insulin.

Since crude secretin contained an agent other than insulin, investigators attempted to determine whether this agent acted by stimulating the pancreas or was capable, by itself, of lowering the blood sugar. In animals there are numerous experimental results which support one or the other action, but those of Zunz and La Barre (*Bull. Acad. roy. de méd. de Belgique* 8:801, 1928) appear to support a dual mechanism. Using adrenalectomized dogs with pancreaticojugular anastomoses, they found that purified secretin injected into the donor dog caused a drop in blood sugar in both the donor and the recipient, with the fall more marked in the latter. Since in this experiment the donor is physiologically depancreatized, the results given may be interpreted as a double action of the hypoglycemic agent. This concept is fortified by their results

with jugulojugular anastomoses: the injection of secretin into the donor produced only a slight decline in the recipient, and this was less marked than that which occurred in the donor.

In human subjects both in normal persons and in patients with mild diabetes, we (*Ann. Int. Med.* 11:1563 [March] 1938) have repeatedly been able to prevent alimentary hyperglycemia following the absorption of amounts of dextrose ordinarily adequate to produce a sharp rise in blood sugar. We accomplished this by duodenal mucosal stimulation during the time of absorption of dextrose. In one instance we were fortunate in having available for study a patient with very severe diabetes who had either a diffusely calcified pancreas or intrapancreatic ducts which contained stones in many of its branches. By roentgenograms we were able to visualize many small diffusely calcified areas in the region of the pancreas. In this patient duodenal stimulation under the conditions described failed to prevent the rise in blood sugar that occurred after the absorption of a similar amount of dextrose when duodenal stimulation was omitted. These results lead us to believe that in man the hypoglycemic duodenal agent acts essentially through islet stimulation. Further, that, if true, little can be expected from the use of duodenal extracts in the treatment of diabetes in man; in mild cases of diabetes some effect may be seen from islet stimulation; in severe diabetes there will probably be no effect or even an injurious one by stimulation of already severely damaged islets.

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JACOB GERSHON-COHEN, M.D., D.Sc.(Med.)

SAMUEL S. FELS, LL.D.

Philadelphia.

MANAGEMENT OF TETANY

To the Editor:—The article by Margolis and Krause (*THE JOURNAL*, March 25, p. 1131) raises an important point that is not generally accorded sufficient recognition. Despite the frequent demonstration of the importance of phosphorus in tetany, little attention is paid to this element in the dietary management of clinical parathyroid tetany. Shelling and Goodman (*THE JOURNAL*, March 3, 1934, p. 669) pointed out that neglect of this factor may account for the occasional refractoriness of such patients to treatment with calcium and solution of parathyroid. There are several observations supporting the view that a relatively high phosphorus intake tends to exaggerate the metabolic defect characteristic of the hypoparathyroid state (Albright, Bauer, Claffin and Cockrill: *J. Clin. Investigation* 11:411 [March] 1932. Robbins and Kydd, *ibid.* 14:220 [March] 1935. Allardyce: *Am. J. Physiol.* 98:417 [Oct.] 1931). The fact is too frequently overlooked that milk, which is usually administered in large amounts in such cases, provides an excess of phosphorus as well as calcium and may actually exert a deleterious effect in parathyroprivic tetany. Objections to the use of vitamin D in this condition have been emphasized by Shelling (*Bull. Johns Hopkins Hosp.* 50:318 [May] 1932; *THE JOURNAL*, March 3, 1934, p. 669; *Am. J. Dis. Child.* 47:61 [Jan.] 1934) and Cantarow (*Internat. Clin.* 1:230 [March] 1936; *Endocrinology* 21:368 [May] 1937). This matter is discussed in the report in *Endocrinology* (24:556 [Feb.] 1939) of a case of chronic idiopathic hypoparathyroidism which did not respond to vitamin D therapy and was effectively controlled by solution of parathyroid and a high calcium, relatively low phosphorus intake over a period of five and a half years. This regimen became ineffective on two occasions when the only change consisted in an increased intake of phosphorus (and calcium) (milk) and vitamin D and again became effective when the latter were omitted.

In the article by Margolis and Krause, no statement is made regarding the phosphorus content of the diet during the period of uncontrolled tetany (seven months). It is specified that a low phosphorus diet was given for about ten days prior to the

administration of dihydrotachysterol, but apparently solution of parathyroid was not given during this period.

This comment is in no sense a criticism of the use of dihydrotachysterol in parathyroprivic tetany; there can be little question of the effectiveness of this agent in this condition. I feel, however, that the fact should be emphasized that the phosphorus content of the diet must be maintained at a relatively low level during administration of solution of parathyroid before the conclusion is reached that the latter agent is ineffective. If this is done, I believe that there will be fewer instances of apparent refractoriness to solution of parathyroid in parathyroprivic tetany.

ABRAHAM CANTAROW, M.D., Philadelphia.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

OPTIMUM AIR CONDITIONS IN HOUSES

To the Editor:—Please advise me of the present opinions of the hygiene of living room temperatures. Few families have instruments for measuring humidity and many old persons complain of chilliness unless the thermometer registers from 76 to 80 F. Is this harmful? If so, what reason can be given them why it is worse than the same temperatures in summer? At what distance from the floor should the thermometer be hung?

M.D., California.

ANSWER.—Room temperatures much above 70 F. are generally considered undesirable in cold weather because they aggravate the effects of temperature contrasts when persons pass from overheated rooms to cold outside air. Because of a reduced metabolic rate and lack of resilience of the vasomotor system many elderly persons require temperatures in the upper seventies, but an attempt should be made to reduce the comfortable temperature level by suitably insulating exposed walls and by the employment of tight fitting storm sashes when such measures are justified.

Measurements of temperature are usually made at a level 36 inches above the floor and at least 3 feet away from the exposed walls. In rooms for the aged it is preferable to record the temperature at knee-height level, 18 inches above the floor.

In warm summer weather an indoor temperature of 80 F., or even 85 F., with low humidity is comfortable and desirable, from the standpoint of health, because the human organism becomes adapted to heat and cannot stand sudden drops in temperature, especially when the body surfaces are wet with perspiration. The practice of cooling public buildings to 80 F. or less in hot weather appears to be a distinct menace to the health of susceptible persons who expose themselves to such contrasts in temperature.

LIVER EXTRACT FOR HYPERTENSION

To the Editor:—In the first edition of Beckman's "Treatment in General Practice" I find reference to a liver extract used in essential hypertension. Will you inform me of the form of liver extract used in this condition and its probable value in such a condition of some three years' standing in a woman "passing through" the menopause?

M.D., Arizona.

ANSWER.—Hypodermic administration of liver extracts in the treatment of hypertension was enthusiastically advocated some ten or twelve years ago. That a vascular relaxation and transient fall in the arterial tension occur after such injections has been thoroughly demonstrated. The hepatic extracts were said to abolish the pressor effects of guanidine on smooth muscle (Major, R. H.: *J. Kansas M. Soc.* 25:177 [June] 1925) but the evidence that guanidine is a significant etiologic factor has never been convincing.

Since then, tissue extracts other than that of liver have been given extensive clinical and experimental trial. Active preparations of muscle, brain, spleen, myocardium and pancreas (insulin-free extract) have been studied. They are all antagonistic to the action of epinephrine. It is claimed that their vasodilator activity is not due either to histamine or to choline. The active principles appear to be closely related to adenosine or adenylic acid. Knowledge, however, concerning the active

fractions of these extracts is still incomplete and their clinical application tentative and experimental.

All these tissue extracts must be given by injection, either subcutaneously or intramuscularly. The injections must be repeated two or three times a week at least. It thus becomes increasingly difficult to retain the patient's cooperation, particularly since the great majority of hypertensive persons feel well. The clinical results have proved most disappointing.

On the meager data available it is impossible to suggest the proper therapeutic approach for the patient mentioned. Hypertensive arterial disease is a highly individualized disorder, especially regarding its provocative etiology. Thus the therapy of individual cases should depend on the etiologic factors involved.

DERMATITIS FROM RED LEAD

To the Editor:—A man was first seen by me in the fall of 1937 because of a generalized erythematous and intensely pruritic dermatitis involving the whole body more or less uniformly. He was a tall blond, middle aged Scandinavian and for eight months had been employed on a dredge. His work was painting metal on the dredge with red lead, which he did for about six months. After this time an irritative erythematous dermatitis developed in both popliteal regions and over both hip areas. He quit work immediately and consulted a physician, who treated him symptomatically without improvement. Because of the gradual spread of the dermatitis he consulted a skin specialist, who hospitalized him, and he remained in various hospitals under the care of various specialists about seven months. On the basis that this was a contact dermatitis or a cutaneous manifestation of a systemic poisoning, conservative management consisted of calamine in oil with 1 per cent phenol packs, boric acid packs, Rowe's elimination diet, numerous antipruritic ointments and sedation. This therapy was carried out in the hospitals and all orders were meticulously followed. For the next several months the patient experienced remissions and exacerbations, but in the last analysis the condition remained stationary. The elimination diet revealed nothing significant, and sodium thiosulfate intravenously was given daily and fractional doses of superficial roentgen therapy were given over the entire body, small areas at a time. Patch tests could not be done because of the extremely irritated condition of the skin. There were removed from his bed one or two cupfuls of branny, desquamated skin. His condition remained about the same, so he was sent to the university hospital for further care, only to return in about the same condition. Finally about ten months after the onset there was a gradual but definite improvement, and after a siege of about twelve months his skin again became normal. Search was then instituted for a probable offending agent in his residential and occupational environment, and by patch tests he was found definitely sensitive to some of the red lead that he had previously used. Could this have been a generalized dermatitis due to lead or lead oxide or to systemic lead poisoning? Have there been like cases reported in the literature? What further therapy could have been used? What is the value of x-rays or ultraviolet rays in the treatment of this condition? Is the use of sodium thiosulfate logical? Please enumerate references to be found in the literature about this type of dermatitis.

M.D., Minnesota.

ANSWER.—The case described brings out many factors to be considered in a diagnosis of dermatitis due to paints.

First, "red lead" or minimum (Pb_3O_4) is not often used today in red paints or, if it is, only in small quantities. Even white lead is sparingly used because of the hazard of lead poisoning.

There are many substitutes for red and white lead, and these substitutes are the ones extensively used as paint pigments. The red pigments most frequently used are made from synthetic dyestuffs, the principal red ones being paranitraniline red, No. 44 in the Colour Index, lithol red 2G, No. 166, toluidine red, No. 69, alizarin, No. 1036, and eosin, No. 771 in the Colour Index. The coal tar pigments are used in the form of lakes, which are made by precipitating organic dyes on inorganic bases, the lake thus formed being similar to a dyed fabric. Other red pigments used are mercuric sulfide, red oxide of iron, cadmium sulfide, selenium sulfide, red oxide of mercury and chrome red or basic lead chromate. A few of the natural dyes such as madder and cochineal are also occasionally used as lakes in paints. The principal bases used for lakes are precipitated barium sulfate, known as blanc fixe, barite, and sometimes white lead (basic lead carbonate) and lead sulfate. From this it is evident that the patient's actual exposure to lead may have been none at all or very little. In order to make sure of this, it would be necessary to make a chemical analysis of the paint that the patient used.

Paints, in addition to the pigment, contain a medium of drying oil and a thinner. The drying oils may be tung oil, linseed oil, castor oil, perilla oil, soybean oil, cottonseed oil, pine oil and fish oil.

The thinners are turpentine or turpentine substitutes such as petroleum distillates. In addition to this, paints also contain driers which may be organic or inorganic, such as the linoleates of metals and the oxides of metals.

The most likely substances in paints from which a contact dermatitis may be developed are the thinners. Hypersensitivity

may also be present toward some of the drying oils and toward some of the pigments, especially the synthetic dye lakes.

Lead has not been reported to have caused dermatitis. It would have been interesting to examine the patient for the symptoms of lead poisoning or lead absorption such as colic, blue line on the gums, anemia, weakness of the extensors of the wrists, albuminuria and punctate basophilia ("stippling") and to examine the urine and feces for the presence of lead, especially after the administration of sodium thiosulfate.

Since dermatitis is not one of the symptoms of lead poisoning, the dermatitis was not from that cause. If it was a contact dermatitis, it would be natural to suppose that it would have started first on the parts exposed to the paint, i. e. the hands and the face. Also if the patient had a contact dermatitis from any of the ingredients in the paint he should ordinarily have recovered more rapidly than he did when exposure was eliminated, and he should not have had remissions and exacerbations while he was not working and was under treatment. So far as the patch tests are concerned, it is not stated whether a patch test was done with dry pure red lead (Pb_3O_4) or with the paint that the patient called "red lead" or whether the patch test was performed with the dry paint or the wet paint. Wet paint containing a considerable amount of turpentine or turpentine substitute will cause a positive reaction on most persons if left on the skin as a patch test for twenty-four hours; the thinner in most cases is a primary irritant. If the patch test was done with dry paint and a positive reaction was obtained, the pigments, oils and driers must be considered as possible causes of the dermatitis.

It is not believed that the case was one of dermatitis due to systemic lead poisoning, nor is it believed that it was a contact dermatitis due to lead, unless red chromate of lead was the pigment used, and then the dermatitis may have been due to the chrome radical in the compound rather than to the lead radical. Although there have been many cases of dermatitis reported in the literature as due to paint, there have been none attributed to lead poisoning.

No further treatment than that already given can be suggested.

In view of the doubtful diagnosis, no comment can be made as to the value of x-ray, ultraviolet or sodium thiosulfate therapy.

Has a diagnosis of dermatitis exfoliativa (Hebra's disease) been considered?

References on lead poisoning:

- Occupation and Health: Part II, Geneva, International Labour Office, 1934.
Morrell, R. S., and de Waele, A.: Industrial Chemistry Series, New York, D. Van Nostrand Company, Inc., 1921.
Hamilton, Alice: Industrial Toxicology, New York, Harper & Brothers, 1934.
Mayers, May R., and McMahon, Minnie M.: Lead Poisoning in Industry and Its Prevention, special bulletin 195, New York State Department of Labor, Division of Industrial Hygiene, 1938.

SO-CALLED BLACK DERMOGRAPHISM FROM GOLD JEWELRY

To the Editor:—I would appreciate information regarding the chemical reaction that causes the precipitation of a black seum whenever a gold wrist band or other jewelry, for example, a neck piece, comes in contact with skin. What can be done to prevent it?

SIDNEY F. LEBAUER, M.D., Greensboro, N. C.

ANSWER.—Endin and Kismenko discussed this phenomenon in 1925, noting that it occurred most often on dry skin smeared with fat and powder. In spite of this pertinent observation, they favored the idea that the phenomenon was another sign of hysteria. Breitman in 1928 thought it dependent on the character of the natural cutaneous lipoids. Jurjew in 1928 reported a case of adiposogenital dystrophy in which stroking the skin with a metal instrument resulted in black stripes. Soon afterward, Hauck and Dietel and Hosp (Hosp, E.: Untersuchungen über die "Schwarze Hautschrift," *Dermat. Wchnschr.* 91:1895 [Dec. 27] 1930) reported investigations demonstrating that soft metals make more distinct marks than hard ones and that the tendency to respond with black marks is not increased by sweat (actually decreases it), fat or alkalinity or acidity of the skin or by mechanical, chemical, photochemical or thermal changes in the skin. On the other hand, they found that zinc oxide ointment made this black writing with a metal instrument possible on any skin and that the marks consist of fine particles of the metal which have been rubbed off by friction on the zinc oxide and have been quickly oxidized by contact with the air.

After an ordinary bath, enough power still adheres to the skin to produce the phenomenon; but after thorough scrubbing or cleansing with benzine the black marks cannot be produced. Parts below the powdered area, or parts in contact with clothing that has rubbed on the powdered area, are also susceptible to marking because of the transfer of powder. The skin of one who

is not susceptible can be made so by rubbing it with a cloth which has rubbed the skin of a susceptible person. After the application of zinc oxide ointment any skin will show the phenomenon. On live skin the ability to respond with black marks is only temporary, disappearing in a few hours. On the skin of a corpse it remains for a long time, until removed by rubbing or washing. Many substances besides zinc oxide will produce this condition: calcium or barium sulfate, calcium carbonate, white lead, fine salt or fine sand. Coarse powders, such as coarse sand, will not produce it, nor will the various starch powders or talcum powder.

Lead and metals softer than lead will write on clean dry skin. Silver and harder metals require the presence of a fine powder.

The phenomenon has been called black dermatographism. Technically correct, it seems advisable to reserve the name dermatographism for the ability possessed by some skins to respond with wheal formation to pressure or stroking.

If patients use only talcum or starch powders they will not be annoyed by black marks from the contact of jewelry with the skin. The possibility of face powder containing harder components sifting down onto the chest must not be forgotten, however.

EMPHYEMA OF GALLBLADDER

To the Editor:—What are the probabilities for a postoperative hernia following cholecystectomy for emphyema of the gallbladder in terms of percentage? Does chronic alcoholism have any influence? If so, what is it? Just how much of a factor is diabetes mellitus, if any, in connection with such a postoperative hernia? What is the incidence of unabsorbed sutures in connection with the operation mentioned? In case of an infected wound from the emphyema would an unabsorbed suture cut any figure in the event of a postoperative hernia? M.D., California.

ANSWER:—No figures have been found on the incidence of postoperative hernia following cholecystectomy for emphyema of the gallbladder. It is doubtful that chronic alcoholism or diabetes would be a factor in such a case, although infections prosper in the presence of diabetes. An unabsorbed suture would be unlikely to play a part.

The principal difficulty is the virulent infection usually present in an emphyema of the gallbladder. The fascia should be sutured with interrupted chromic catgut and not too tightly and ample drainage of the gallbladder should be carried out, every effort being made to prevent infection, at least widespread infection, of the fascia. Despite these measures, postoperative hernia will inevitably occur in a small percentage of cases.

COMPLEX ALKALI VAGINAL DOUCHE

To the Editor:—I would appreciate your opinion of the following formula: sodium bicarbonate 16 ounces, sodium borate 16 ounces, sodium chloride 5 ounces, sodium benzoate 1 ounce, menthol 1 drachm, bordeaux red 8 grains, oil of thuya 1 drachm. I have been using this formula for my gynecologic patients as a general douche for the past three months. Results are satisfactory and patients seem to like it, stating that they feel clean and refreshed after douching. Some patients use it two or three times daily. I should like to know whether prolonged use of this formula can cause any temporary or permanent local or systemic damage. Are the drugs in the formula used in proper proportion? If not please recommend the proper concentrations. In addition, please suggest whether the efficiency of the formula can be improved by omitting or adding different drugs. M.D., New Jersey.

ANSWER:—There is no need for such a complicated douche, particularly because it is no better than most simpler and cheaper douches. In fact this douche may in some cases do harm. Practically all the ingredients in this douche have an alkaline reaction and, as Roblee and Karnaky have shown, alkaline douches may have a bad effect on the cervix and the vagina. In fact Roblee maintains that an alkaline medium in the vagina may result in the formation of "erosions" on the cervix. A simple way to cure such erosions is to maintain an acid medium in the vagina.

Nearly all pathogenic organisms in the vagina, especially the gonococcus and the trichomonas, disappear if the vagina is kept strongly acid. In gonorrheal vulvovaginitis in children, for example, cures can be obtained in nearly all cases by using acid tablets in the vagina. In the cases of vulvovaginitis in which estrogenic substance is used, cures are obtained only in the cases in which the vaginal reaction is acid.

From the foregoing remarks one may conclude that alkaline douches are not only useless except as mechanical cleansers but may actually do harm. Only acid douches should be used. The best substances for douching are lactic acid and vinegar (5 per cent acetic acid). Vinegar is cheaper and somewhat better. If lactic acid is used, one teaspoonful of it should be added to two quarts of warm water. When vinegar is used, four tablespoonfuls should be added to two quarts of warm water.

SULFANILAMIDE AND CONVULSIONS

To the Editor:—A boy aged 19 months and weighing 30 pounds (13.6 Kg.) was given an initial dose of 20 grains (1.3 Gm.) of sulfanilamide (orally) for acute follicular tonsillitis. This condition was present for two days before the administration of the drug, and the temperature varied from 100 to 105.8 F. With the high temperature the child was delirious. On the third day of illness there was no fever. A consultant pediatrician found the tonsils enlarged and reddened. He advised that sulfanilamide be given in the quantity stated. About twenty to thirty minutes after this was done the child uttered a peculiar cry and turned blue, and his extremities became rigid. He immediately became agitated and kept on throwing himself around on a couch. There was no loss of sphincter control and no biting of the tongue, although the child did grind his teeth and almost presented risus sardonius. At times he would assume the position of opisthotonos and right after that would throw himself around on the couch. He was given one-eighth grain (0.008 Gm.) of morphine sulfate by hypodermic injection. This helped after about twenty minutes. He was then taken to a hospital, where a spinal tap was performed, because it was thought that cerebrospinal meningitis should be ruled out. The cerebrospinal fluid was under increased pressure, sugar was present, globulin was not increased and there were 6 lymphocytes present. No further tests were done on this fluid. Examination of some catheterized urine was negative. A blood count showed the hemoglobin and red cells to be normal. There were 4,400 white cells, and the differential showed 61 per cent polymorphonuclears, 39 per cent lymphocytes and a shift to the left. The temperature on admission to the hospital was 101 F. The convulsive movements lasted about two hours. After this spinal tap a second pediatrician was called in. At this time the child was asleep or, rather, comatose. The reflexes were all diminished but present. The consultant believed that the convulsions might have been due to the tonsillitis but did mention the possibility of an influenzal meningitis with good prognosis. He also stated that there was a good possibility of this being a case of acute encephalitis. I might add that during the convulsive state the child's eyes would roll backward toward his head and his tongue would be pushed out of his mouth and even deviated to either side. A third pediatrician was then called in and he stated that the convulsions were due to the sulfanilamide. The father of the child suffers from hay fever and bronchial asthma. This consultant admitted never having seen any convulsions due to the administration of the drug. He explained that there was most likely a condition of acidosis present which was brought on by the sulfanilamide. The urine, however, was distinctly alkaline. The infant was given 30 grains (2 Gm.) of sodium bromide rectally and $\frac{1}{2}$ grain (0.0003 Gm.) of atropine sulfate. During the night he was restless and cried often, and his hands would assume athetoid positions while the rest of his extremities were at times rigid. The next day he was a little improved and no longer comatose. He sat up in his crib, asked for water and drank it alone. He had a peculiar facial expression which was dull and vacant. He seemed to be puzzled by everything around him and his eyes had a far away look. It seemed as if he was not in contact with reality. Then again he would become quite normal for a minute or two, speaking distinctly and quite lucidly. During the day while he was no longer comatose the child would still keep on posturing with his hands but to a lesser degree than he had the night before. Forty-eight hours after admission a second tap was performed and now the cerebrospinal fluid was not under increased pressure. There were only 2 cells, sugar was present and the amount of globulin was normal. The fluid was crystal clear in each tap and only about 5 cc. was removed each time. The third day of hospitalization he was still improving mentally and a second blood count showed it to be entirely normal. Sixty hours after the onset of the convulsions a maculopapular eruption developed behind the ears and on the scalp line. It was also present on the thorax. There was no fever and the cutaneous lesions did not appear pruritic. During the day the rash would become quite faint and then reappear. It lasted about twenty-four hours. The tonsils were improved. All told, the child remained in the hospital about four and one-half days and made a complete recovery. The mother states that a similar rash developed at home a few days after this but I was not called to see it. Do you think that the sulfanilamide was the cause of the convulsions? What facts in the history as presented would make you agree or disagree with this as the cause? What is the most likely explanation of the rash? Do you know of any cases in which sulfanilamide per se caused convulsions in human beings? M.D., New York.

ANSWER:—It does not seem probable that the convulsions were caused by the sulfanilamide in view of the fact that the dosage was small. It would seem more likely that the relationship between the convulsions and the ingestion of sulfanilamide was coincidental, in view of the fact that such a relationship has not been reported despite the widespread use of the drug in recent years, and that the convulsions were associated with the infection in view of the not infrequent occurrence of convulsions with acute infectious diseases in childhood. Furthermore, the eruption can be explained as an accompaniment of the infection, also in view of their frequent occurrence in various febrile states. The toxic manifestations from the use of sulfanilamide have in most instances resulted from fairly large doses. Among such are dizziness, headaches and mental confusion. The maculopapular eruptions have been noted particularly after exposure to light and it has been suggested that the cutaneous reaction is due to a vasculotoxic effect of porphyrin; some observers have reported abnormally high values in the urine of patients taking sulfanilamide. In the present case no determination was made of the amount of sulfanilamide in the blood, but it must have been at a low level and could probably not account for any of the toxic symptoms that have been associated with the taking

of sulfanilamide. Such laboratory data as the carbon dioxide combining power of the blood, the oxygen saturation and the amount of sulfanilamide would be necessary in order to say whether or not the convulsions were due to an associated acidosis and whether or not the cyanosis was due to the sulfanilamide. So far as is known, there are no reports of convulsions in human beings caused by sulfanilamide.

INCIDENCE OF TRICHINOSIS

To the Editor:—In the January 26 issue of the *Fränkische Tageszeitung* in Germany, I find the amazing statement that 17 millions of Americans are suffering from trichinosis, with a mortality of several thousand in the past year. This was declared by Dr. Nelson, a professor at Rutgers University—according to the German paper—in an address delivered to the health department of New York City. He is also quoted as having said that trichinosis in the United States is one of the most prevalent diseases and that no meat inspection is made in more than 30 per cent of the samples submitted for examination. He is further quoted as having closed his speech with the sentence: "Nothing is done to protect the people, but, nevertheless, they build skyscrapers." In view of the tendency of the German press to spread false news about conditions in the United States, I would appreciate an informative reply to my inquiry. Is there a reliable statistical estimation as to the prevalence of trichinosis?

LEO F. BLEYER, M.D., Elmira, N. Y.

ANSWER.—The information from the German press cited was based on an address given by Thurlow C. Nelson, Ph.D., professor of zoology, Rutgers University, New Brunswick, N. J. The title of the paper given by Professor Nelson was "The Trichina: Public Enemy Number One Among Parasites of the Metropolitan Area." It was presented before a conference of health officers of the New York metropolitan area January 24.

The statement that 17 millions of Americans are suffering from trichinosis was based on extensive postmortem studies that have been carried out in recent years. Because of more refined methods, a large proportion of postmortem material now reveals the presence of *Trichinella*. Most investigators have used the method of digesting the diaphragms removed at necropsy in artificial gastric juice and of then examining the sediment for larvae. Others have combined with this procedure a microscopic examination of the muscle. The incidence of the disease in terms of percentage of necropsy material containing larvae in various parts of the country is as follows: Rochester, N. Y., 17.15 per cent; Boston, 27.6 per cent; Minneapolis, 17.09 per cent; New Orleans, 3.5 per cent; San Francisco, 24 per cent; Washington, D. C., and Baltimore, 13.67 per cent; Chicago, 14 per cent; St. Louis, 15.37 per cent. A more refined technique used in Cleveland brought the incidence up to 36 per cent. It should be pointed out that in practically all the material examined death was ascribed to some other cause. It is difficult to determine the death rate of trichinosis. If it is based on cases recognized during life, the rate is low. On the basis of the foregoing postmortem observations, it is obvious that many cases of trichinosis are not recognized or properly diagnosed. It is well known to most clinicians that the disease may be easily confused with many other conditions. Furthermore, not all cases present the classic laboratory evidence of eosinophilia. An advance in the diagnosis of trichinosis has been made recently through the utilization of cutaneous and serologic tests. While a study of postmortem material will not give an accurate estimate of the incidence of trichinosis in the population at present, it nevertheless indicates a definite trend and that the disease is much more common than the experience of the average physician would indicate.

The late Dr. M. C. Hall, chief of the division of zoology of the National Institute of Health in Washington, D. C., stated in 1938 that the federal government inspects only about 70 per cent of the meat in this country. It is recognized that the remainder is inadequately inspected. The federal government inspects only the meat of packers who engage in interstate commerce. Even the federal inspection is inadequate, since no practicable provision is made for pork sold which is intended to be cooked; inadequately cooked pork appears to be the source of most cases of trichinosis.

It is of interest that toward the end of the last century Germany prohibited the importation of pork produced in America, because it was the belief that the high incidence of trichinosis in Germany was due to infected meat imported from the United States. The Germans contended that German meat sold in Germany was free from *Trichinella* because of an elaborate system of microscopic inspection of all pork for larvae. This examination would prevent the sale of trichinosis meat; therefore the source of human cases of trichinosis must be due to imported American pork products. The United States instructed Dr. C. W. Stiles in 1898 to determine the value of the German system of pork inspection. His conclusions, after two years' observation, showed that out of 6,329 cases of

trichinosis occurring in Germany between 1881 and 1898, 3,388 cases with 132 deaths appeared to have been due to faults of the method of German inspection. There are no reliable statistics on the incidence of trichinosis in Germany at present.

There is no doubt that trichinosis constitutes one of the major public health problems of today. The United States Public Health Service has recognized this, and a number of excellent surveys and recommendations for the control of the disease have been published in the last two years. For further information concerning this subject, the following publications of the United States Public Health Service are recommended:

- Hall, M. C., and Collins, B. J.: Studies on Trichinosis: I. The Incidence of Trichinosis as Indicated by Postmortem Examination of 300 Diaphragms, *Pub. Health Rep.* 52:468 (April 16) 1937.
Hall, M. C.: III. The Complex Clinical Picture of Trichinosis and the Diagnosis of the Disease, *ibid.* 52:539 (April 30) 1937.
Hall, M. C.: VII. The Past and Present Status of Trichinosis in the United States, and the Indicated Control Measures, *ibid.* 53:1472 (Aug. 19) 1938.
Hall, M. C.: The Role of the Garbage-Fed Hog in the Production of Human Trichinosis, *ibid.* 52:873 (July 2) 1937.

TOE NAILS

To the Editor:—A girl aged 17, active, well nourished, healthy, vigorous and athletic, now in her third year at high school, bruised her right big toe in a basketball contest three weeks previous to my seeing her. Some two or three weeks following this the nail in this toe has become lifeless looking in appearance—a light grayish nail in good position, not distorted in growth (of dark egg shell appearance), which can be cut from above down or probed without pain. The tissue surrounding both toes is healthy and normal in appearance. There is no apparent inflammation or pus. The big toe on the other foot is likewise involved. The egg shell nail, which is associated with hyperhidrosis, has been thought of and certain debilitating diseases, but the patient evidences no such history. All the other toes are perfectly normal in appearance and growth.

M.D., New York.

ANSWER.—The egg shell nail, described first by J. N. Hyde (The Egg Shell Nail, *J. Cutan. Dis.* 24:145, 1906) is a thin nail, white with a purplish tinge, uptilted at the free border. It is part of the picture of erythrocytosis of the extremities associated with hyperhidrosis, the whole dependent, in all probability, on some disturbance of the endocrine glands. It is seen most frequently in young girls.

The case under discussion lacks all these criteria except change of color. Injury is untenable as a cause, for there has been no evidence of subungual hemorrhage and the symmetry of the change of color requires the assumption of an unlikely coincidence of injury also to the other big toe.

Primary discoloration of the nails is rare, resulting, according to Heller, the leading authority on diseases of the nails (*Handb. d. Haut- u. Geschlechtskrankh.*, Berlin, Julius Springer 13:131 [part 2] 1927), from icterus, hemorrhages due to general causes, racial pigmentary peculiarities, pigmented nevi, psoriasis or endocrine disorders. Only the last two can be considered in the present case.

Addison's disease and hyperthyroidism cause change of color of the nails and it is possible that slighter endocrine disturbances may be found sufficient. Rarely psoriasis makes its initial appearance as a discoloration of the nails with thickening, followed by the thimble-like pitting, cross furrows, irregular depressions or partial separation of the nails at the free border or the sides seen so often in psoriasis. None of these changes in the nail are diagnostic, however, and only after the appearance of ordinary cutaneous lesions can the diagnosis be settled.

Loss of translucence of the nails can be secondary to anemia, particularly chlorosis, angiospasm, polycythemia, icterus and pigmentary diseases, all of which can be ruled out easily in the present case. Thickening of the nail plate or increase of the subungual horny layer may destroy the translucence. A growth of monilia or other fungus could produce the same result. Here again the difficulty is in explaining how the two big toes and no others became infected simultaneously. Scrapings from under the free border of the nail, examined in solution of potassium hydroxide, or cultures on Sabouraud's maltose agar, are indicated.

If a dressing of mercury solution was applied to the toe after the injury, the change of color of that nail can be explained; this leaves the same difficulty of explaining the corresponding alteration in the nail on the left big toe. Such a discoloration has been discussed by J. L. Callaway (Transient Discoloration of the Nails Due to Mercury Bichloride, *Arch. Dermat. & Syph.* 36:62 [July] 1937). It is seen frequently after treatment of infections about the nails with mercury solutions or white precipitate ointment and is due to an impregnation of the nail with mercuric sulfate, which seems to be precipitated by light.

Slight changes in the nails seldom furnish much help in diagnosis. They must be considered in the light of other signs and symptoms.

POSSIBLE EPILEPTIC EQUIVALENT

To the Editor:—A white unmarried woman aged about 26, whose general physical examination is negative except for a rather low systolic blood pressure and chronic deafness, complains of "spells" which have been present for the past ten years and are gradually growing more severe, especially during the past few months. The "spells" consist of a clouding of consciousness, at which times she is unable to concentrate mentally and is not aware of what she is doing. In general they are much like conditions found in diabetic patients with hypoglycemia, the chief difference being that the spells are of short duration (from a few minutes to a half hour) and end spontaneously without treatment. She has never had a complete loss of consciousness, anything resembling a convulsive seizure, and the spells are not followed by headache or other symptoms. There has been no epilepsy or other nervous disorders in the patient's family. The following blood sugar tests have been made: Nov. 2, 1938, 87 mg. of sugar per hundred cubic centimeters of whole blood, shortly after an attack; November 14, 83 mg. also shortly following an attack; November 16, 97 mg. taken before breakfast while she was on her usual diet and on a day when she did not have a spell. She was hospitalized December 16, at which time the fasting blood sugar was 75.5 mg. One hour after her usual breakfast it was 66.3 mg. Two hours after breakfast it was 106.4 mg. One hour after her noon meal it was 97.6. Two hours after her noon meal it was 97.0. Three hours after it was 96.1. She was then placed on a low carbohydrate diet and the following morning one hour after breakfast the blood sugar was 115 mg. One hour after the noon meal it was 129 mg. The following morning she was given 90 Gm. of dextrose, with considerable water before breakfast. One-half hour later the blood sugar was 70.2 mg., one hour later 65.6 mg. and one and one-half hours later 69.4 mg. That day she had her regular noon meal and about three hours later had one of her "spells." The blood sugar test taken just as she was recovering from it showed 96.6 mg. Because she is alone most of the time it has been impossible to obtain a blood specimen at the beginning of or during an attack. The attacks are becoming more and more frequent and interfere with her work. This brings up the question as to what would be the most advisable course to follow in her case. I notice in the recent literature that some small doses of insulin frequently are a great deal of help in simple chronic hypoglycemia. I am wondering, however, if in this case the trouble might be associated with a tumor of the islands of Langerhans and if an exploratory laparotomy might be advisable. There was no sugar in the urine following the 90 Gm. of dextrose by mouth.

M.D., Wisconsin.

ANSWER:—The patient has been well studied as regards blood sugar and sugar tolerance but these laboratory data all seem to indicate that there is no remarkable disturbance in this sphere. It is unusual to see convulsive seizures due to hypoglycemia unless the blood sugar level falls below 40 or 50 mg. per hundred cubic centimeters. The attacks described might well be epileptic equivalents with clouding of consciousness. It might be helpful to test the patient for carotid sinus hypersensitivity. If this proves to be normal, studies of the cerebrospinal fluid should be made with measurement of the cerebrospinal fluid pressure. In addition roentgenograms of the skull would be helpful and finally electro-encephalographic or air encephalographic studies might be done. All these tests would help rule out some intracranial causes of epileptic seizures. It would not seem advisable to recommend exploratory laparotomy in view of the available blood sugar studies, which do not definitely indicate that there is hyperinsulinism present. A simple therapeutic test would be the administration of large amounts of dextrose daily. Also sedative medication with from 0.016 to 0.03 Gm. (one-fourth to one-half grain) of phenobarbital twice or three times a day should be tried alone or together with small doses of ephedrine sulfate 0.024 Gm. (three-eighths grain) twice a day.

PETIT MAL, PYKNOLEPSY OR FRÖHLICH SYNDROME

To the Editor:—A boy aged 14, in the fifth grade, has been having attacks which apparently are petit mal. He is rather obese, being about 6 inches shorter than is normal at his age. His external genitalia are those of a 6 year old. Evidently this is a case of pyknolepsy. What is the differential diagnosis? What further studies would you suggest? What treatment would you advise? I am planning to make a sugar tolerance test and have x-ray studies done of the head, thinking of course that there might be some disturbance of the pituitary gland. Is any type of glandular therapy indicated?

M.D., Connecticut.

ANSWER:—If this patient has petit mal epilepsy, it is doubtful that there is any relationship between the petit mal and the glandular deficiency. The brief description of the physical characteristics suggests a possible Fröhllich's syndrome. However, one would need much more information to make a diagnosis. If the condition proves to be a pituitary gland deficiency, treatment might be attempted with one of the new preparations obtained from the anterior lobe of the pituitary gland. However, before beginning treatment it is advisable to explain to the parents that the treatment is a long and fairly expensive procedure which will require two or three injections a week for six months or a year before results may be obtained. It is possible even then that there will be no results from treatment. If there are, these results will be revealed in a change in the physical characteristics of the child.

Pyknolepsy, as described by Stahrgardt, is a form of epilepsy characterized by petit mal seizures which begin some time between 8 and 10 years of age and disappear spontaneously at puberty. This condition is not affected by any treatment whatever. The diagnosis is confirmed only when the seizures stop at puberty. There are only two forms of treatment which affect the petit mal of idiopathic epilepsy. Those treatments are fasting and the ketogenic diet. Petit mal epilepsy does not respond to any drug treatment.

It would be advisable to take roentgenograms of the wrists and compare the bone age or development with the Todd standards. This will give information as to the state of metabolism of the child. Apparently there is need for an anterior pituitary male sex hormone. A dextrose tolerance test will show an increased tolerance in pituitary deficiency. More complete information would allow a more intelligent diagnosis and schedule of treatment.

"FEBRILE ANTIGENS" FOR DIAGNOSIS

To the Editor:—Lately my associates and I have been using a product of the Lederle Laboratories, New York, for our Widal tests, known as the Typhoid Group Antigens. A number of physicians on our staff have questioned the reliability of the test and I would appreciate any information that you would send me concerning this product.

M.D., Pennsylvania.

ANSWER:—The preparations formerly called "Typhoid Group Antigens," now called "Febrile Antigens, Lederle," consist of suspensions of members of the typhoid (O and H elements) paratyphoid A and B group, for the performance of the agglutination test for infections of the ordinary enteric types to be utilized in a slide test. They should give results approximately equivalent to those obtained by other methods, probably somewhat less accurate so far as concerns exact titrations.

The "Febrile Antigens" package now also contains Proteus antigen for the test for typhus fever and other members of the typhus group and Brucella antigen for the test for undulant fever (brucellosis).

Of course all such tests must be interpreted in the light of other factors and must not be depended on, of themselves, to establish a diagnosis.

SOAPS FOR WASHING DIAPERS—MEASLES WITHOUT EXANTHEM

To the Editor:—1. Will you give me a list of some of the more popular soaps which, if used to wash diapers, are not so strong as to cause a diaper rash in most babies, and also a list of the soaps which may cause irritation when so used? 2. Can a diagnosis of measles be made without the appearance of a rash? I recently saw a 17 months old baby who had been feverish and irritable and vomited repeatedly for twenty-four hours. The buccal membranes were full of Koplik spots, and, since his sister had broken out with the measles only two days previously, I thought he was also getting the measles. However, he became afebrile and was well in two days, and no rash appeared. Could it have been atypical measles?

M.D., California.

ANSWER:—1. If the diapers are properly washed, no soap should remain in them to irritate the baby's skin and cause a diaper rash, no matter what soap is used. The diapers should be washed first in soapy water, rinsed thoroughly in clean warm water, boiled in clear water for ten minutes and then again rinsed thoroughly in clean warm water. To differentiate between nonirritating and irritating soaps, any soap that can be used to bathe the baby without irritating the skin could certainly be used to wash diapers.

2. If the physician is certain that the buccal membranes were full of Koplik spots, the case undoubtedly was one of measles. Especially during epidemics, attenuated or atypical cases of measles occur in which the rash is so slight and transient that it may be undetected at the particular time of the examination.

TREATMENT OF PARKINSON'S DISEASE

To the Editor:—Please describe the latest treatment for Parkinson's disease.

S. H. RAYMOND, M.D., Cazenovia, N. Y.

ANSWER:—There have been no noteworthy recent advances in the treatment of Parkinson's disease. The most valuable agents seem to be those of the atropine group. Treatment with scopolamine seems to be as efficient as anything that has been used. Good results have been reported both with the tincture of stramonium and with a well assayed product of Datura leaves. It has also been found that atropine sulfate itself, given in increasing doses of from $\frac{1}{250}$ to $\frac{1}{50}$ grain (0.25 to 1.3 mg.) three times a day, has had a beneficial influence, especially in the encephalitic forms. More recently cobra venom has been used (Gayle, R. F., Jr., and Williams, J. N.: *South. M. J.* 31:188 [Feb.] 1938).

DIGITALIS IN HEART FAILURE

To the Editor:—The use of one of the most used drugs, digitalis, at times puzzles me greatly. 1. Some lecturers in postgraduate institutions say that digitalis should be used to its full therapeutic effect at the first signs of heart failure, i. e., shortness of breath on exertion with or without cardiac irregularity, and with or without demonstrable edema either pulmonary or swelling of the ankles. In cases such as this, if the examiner feels definitely that the shortness of breath is cardiac, should digitalis be used to its full therapeutic effect? 2. Cases such as the following are not infrequently seen. An individual in middle life has had a coronary thrombosis or some other acute cardiac episode. Within several months there is gain in weight, shortness of breath, pulmonary edema, a heart rate from 90 to 100 usually regular, and there may or may not be enlargement of the heart. The use of aminophylline and mercurial diuretics is necessary. A particular case I have in mind is a person who with the use of mercurial diuretics puts out between 136 and 172 ounces of urine following each injection. Should digitalis be used in its full therapeutic effect in a case such as this?

M.D., New York.

ANSWER.—1. Digitalis should be administered to get full therapeutic dosage, slowly or rapidly as the need indicates, at the first sign of heart failure, whether the evidence is pulmonary or systemic. It sometimes can be used as a therapeutic diagnostic test.

2. With respect to the example cited of the middle-aged patient with left ventricular failure and normal rhythm, digitalis is just as much indicated as in any other case of heart failure. It may not be quite so effective as when there is auricular fibrillation, but nevertheless it should be used in full, even before diuretics. It may often, together with rest, be so effective that diuretics are not needed.

TREATMENT OF PAINFUL VACCINATION SCAR

To the Editor:—A white girl aged 16 years consulted me about a small-pox vaccination scar, one year old. The scar is one-half inch in diameter and raised one-eighth inch above the surrounding skin. She plays basketball and when the scar is bumped it becomes painfully itchy. Would there likely be a return of scar tissue if this scar was excised about one-eighth inch beyond its borders? What would be the simplest and best treatment? Would quick, brief freezing with "dry ice" be feasible?

M.D., Washington.

ANSWER.—The simplest and best treatment of this old vaccination scar would be a delicate excision with a minimum of trauma and close coaptation of the skin edges with a subcuticular suture and follow up with roentgen therapy to the incision to prevent the recurrence of keloid. "Quick, brief freezing with dry ice" is not a satisfactory procedure in the treatment of old thick keloids. In view of the fact that the scar is painful and itchy at times it would be well to examine it microscopically, after excision, to rule out the existence of a cutaneous neuroma.

ARTIFICIAL APPENDAGE FOR LOSS OF FINGERS

To the Editor:—A right handed farmer, aged 50, has lost the digits, save the thumb, of the right hand. The line of cleavage is diagonally from the first metacarpophalangeal joint across to the middle of the fifth metacarpal. What type of artificial appendage would be the most useful to this man in his work? Appearance is decidedly secondary.

BENJAMIN CARLSON, M.D., Lorain, Ohio.

ANSWER.—The most useful type of artificial aid to function would consist essentially of a prosthesis of firm leather which could be strapped or laced to the hand and wrist and to which is attached a broad, semiflexed metal finger, in the position of the middle and ring fingers, to the tip of which the patient could firmly approximate the thumb.

A simple apparatus is far more likely to prove useful than a complicated one; and what this patient needs most is something that will permit him to grasp objects with the help of the prosthesis and the remaining thumb.

ACID-ASH DIET

To the Editor:—A question with regard to the "acid-ash diet": Why is salt contraindicated? Send me, or refer me to, an acceptable acid-ash diet list.

M.D., Texas.

ANSWER.—Diets providing an acid ash are sometimes used in the dietary treatment of renal diseases, particularly when the condition is associated with edema. As a rule, dietary treatment is not sufficient but is supplemented by the administration of acidifying salts such as ammonium chloride. Foods which provide an acid ash are cereals, including bread and other cereal products, meats, eggs and fish.

Discussions of acid-ash diets with information about foods can be obtained from almost any standard textbook on nutrition. Salt is contraindicated. It may be easily retained and thus lead

to an accumulation of edema fluid, for the elimination of which the acid-ash diet usually is given. It is customary to substitute salt-free butter for ordinary butter and otherwise to avoid excessive ingestion of table salt.

SPONTANEOUS RUPTURE OF MEMBRANES NEAR TERM

To the Editor:—If the membranes rupture, allowing the amniotic fluid to escape during the last month of pregnancy, is it always advisable to induce labor promptly?

M.D., California.

ANSWER.—Labor should usually be induced in patients in whom the membranes rupture near term. A latent interval usually follows the rupture of the membranes until contractions commence. It is therefore best to wait as long as twelve hours before an induction is undertaken, if indicated, in order to allow a possible spontaneous onset of labor to take place and to assure the best response to the induction. It may be difficult to determine definitely that the membranes have actually ruptured. If this is questionable, nothing should be done. The danger of prolonged rupture of the membranes is infection. Although intra-uterine infection occurs but rarely in such cases, it is always a serious complication.

FIBRIN IN AMNIOTIC CAVITY

To the Editor:—During 1937 I delivered a 21 year old primipara by low forceps and episiotomy and she had a normal puerperium. In May 1938 she returned with amenorrhea, vaginal pruritus and an enlarged uterine fundus. June 4 she had severe abdominal cramps and profuse vaginal bleeding with clots, which continued off and on for two and one-half weeks. A miscarriage was agreed on but no tissue was passed. June 28, reexamination revealed a white flaky discharge and she was started on silver pectate insufflation and suppositories and two weeks later the fundus was still enlarging. She continued a normal pregnancy and delivered a normal male infant November 22, weighing 6 pounds 5 ounces (2,863 Gm.). There were no lacerations and the membranes were ruptured just before the delivery of the head with the escape of a moderate amount of crystal clear water. The placenta was delivered after the baby and was inverted as it presented with two thirds of the inner surface of the membranes covered with a layer of fibrin from one-eighth to one-fourth inch in thickness. There was no laceration of the placenta, cord or baby. The maternal surface of the placenta was apparently normal. My impression is that there was bleeding into the amniotic cavity in June, which resulted in the deposit of fibrin. Is this a frequent occurrence?

M.D., Kentucky.

ANSWER.—It is difficult to explain a deposit of fibrin within the amniotic cavity. This would have to result from bleeding from the cord or the fetus. Fibrin deposits such as the one described are often found extra-amniotically, so that the amnion in this area is considerably thickened. These represent hemorrhage and organization of the blood clots. The hemorrhage may occur early in pregnancy in association with a threatened abortion or late in pregnancy as the result of changes incident to placenta praevia. Microscopic examination of such an area will reveal the organized blood clot.

CONTRALATERAL PHLEBITIS YEARS AFTER INJURY

To the Editor:—A patient was shot with shrapnel in the right leg during the World War and has since suffered with atrophy and severe pain in this member. Since he is forced to favor his right leg in walking or working, a phlebitis has developed in his left leg. In 1916, about two years before his entry into the service, he suffered an attack of typhoid. The phlebitis that now exists in the left leg began only five or six years ago. Now the question is whether or not the phlebitis was produced by the attack of typhoid over fifteen years previous to its onset or could be caused by the gunshot wound in the right leg, which has forced him to use the injured leg a great deal more than he would normally. I have talked this matter over with the rating board of the Veterans Administration and was informed that this particular combination had never been submitted before. If possible I wish that you would let me know if it is possible for a gunshot wound which produced a compound fracture in the right leg to cause a phlebitis in the opposite leg.

STANLEY M. GATES, M.D., Monticello, Ark.

ANSWER.—More data are necessary to form an opinion. One would have to know whether there were any clinical symptoms and signs of venous obstruction during or immediately after the attack of typhoid. It is not likely that the patient had a residual phlebitis on entering military service, as this would have disqualified the patient for service at the front. Another question that arises is whether or not a phlebitis followed the leg injury within a few weeks. In the absence of such evidence, a phlebitis occurring sixteen years after typhoid or fourteen years after a gunshot wound, without any "bridging symptoms," cannot be admitted as having any causal relationship either to the infection or to the injury.

The term "bridging symptoms" is meant to indicate that a phlebitis can be due and can appear in the form of recurrences

as long as twenty-five years after an injury, but the initial attack must be demonstrable and also the recurrences at intervals. The idea that favoring the right leg can bring about a phlebitis in the left leg, again, cannot be substantiated, unless there is good evidence that a femoral or pelvic phlebitis existed at the time of the injury. Otherwise every major amputation would be followed by phlebitis in the other limb, and this certainly is not the case.

In deciding on the merits of such a case, much would depend on the ability to demonstrate the existence of a phlebitis within a few weeks after the infection or injury.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 20-22. Sec., Dr. J. N. Baker, 517 Dexter Ave., Montgomery.

ARKANSAS: *Medical (Regular)*. Little Rock, June 8-9. Sec., State Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, 317 State Line, Texarkana. *Medical (Eclectic)*. Little Rock, June 8-9. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock. *Basic Science*. Little Rock, May 22. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock.

CALIFORNIA: *Written examinations*. San Francisco, July 10-13, and Sacramento, Oct. 16-19. *Oral examinations* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, August 7, and San Francisco, Nov. 15. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Basic Science*. New Haven, June 10. *Prerequisite to license examination*. Address State Board of Healing Arts, 1895 Yale Station, New Haven.

DELAWARE: Dover, July 11-13. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science*. Washington, June 26-27. *Medical*. Washington, July 10-11. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, June 19-20. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

ILLINOIS: Chicago, June 20-22, and Oct. 17-19. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

INDIANA: Indianapolis, June 20-22. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Kansas City, June 13-14. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, June 7-9. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MARYLAND: *Medical (Regular)*. Baltimore, June 20-23. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic)*. Baltimore, June 20-21. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 14-16. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.

MISSISSIPPI: Jackson, June 21-22. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: St. Louis, June 1-3. Sec., State Board of Health, Dr. Harry F. Parker, State Capitol Bldg., Jefferson City.

NEBRASKA: *Basic Science*. Omaha, May 2-3. *Medical*. Omaha, June 8-9. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, May 1-3. Sec., Dr. John E. Worden, Capitol Bldg., Carson City.

NEW JERSEY: Trenton, June 20-21. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York, and Syracuse, June. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, State Education Department, Albany.

NORTH CAROLINA: Raleigh, June 19. Sec., Dr. William D. James, The Hamlet Hospital, Hamlet.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, June 6-9. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Basic Science*. Oklahoma City, May 15. Sec. of State, Hon. C. C. Childress, State Capitol, Oklahoma City. *Medical*. Oklahoma City, June 14. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Medical*. Portland, June 20-22. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland. *Basic Science*. Corvallis, July 8, and Portland, Oct. 28. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia and Pittsburgh, July. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, 400 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, June 27. Sec., Dr. A. Earle Boozar, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 18-19. Director, Medical Licensure, Dr. G. J. Van Heuvelen, State Board of Health, Pierre.

TEXAS: Austin, June 21-23. Sec., Dr. T. J. Crowe, 918 Mercantile Bldg., Dallas.

VERMONT: Burlington, June 14-16. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 21-23. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WISCONSIN: *Basic Science*. Milwaukee, June 3. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical*. Milwaukee, June 27-30. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL, April 22, page 1627.

Book Notices

Spinal Anesthesia. By Louls H. Maxson, A.B., M.D., Practicing Specialist in Anesthetics. Foreword by W. Wayne Babcock, M.D., LL.D., F.A.C.S., Professor of Surgery, Temple University School of Medicine, Philadelphia. Cloth. Price, \$6.50. Pp. 409, with 70 illustrations. Philadelphia, New York, Montreal & London: J. B. Lippincott Company, 1938.

"The writer, being large, middle aged and bald, can hardly qualify as an 'auburn-haired vamp,' but he feels that the spinal anesthetic patient should preferably be watched by a well trained medical man who is qualified personally to administer any treatment or restorative measures that may be called for." One has the impression on reading Dr. Maxson's book that he is indeed reading the words of a well trained medical man who is qualified and who, moreover, has his feet on the ground in a controversy that has waxed warm during the past ten years. The book is definitely on the side of spinal anesthesia. The protagonist is an anesthetist but the book is not controversial. Dr. Maxson goes out of his way to meet all comers but not for the purpose of blasting them into an admission of their errors. He introduces the reader to them in their own words and if he disagrees with them he says so; yet the background of his reasoning has been so painstakingly set forth that the reader understands why he disagrees and is likely to concur. He has correlated the results of present and past clinical and experimental work intelligently, accurately and impartially, thus fulfilling a long felt need. It is this painstaking and thoughtful consideration of the known facts regarding the basis of spinal anesthesia that makes the book worth reading and keeping as a reference work.

Following a foreword by Dr. W. Wayne Babcock, "to whom spinal anesthesia in this country owes a great debt of gratitude," there is a sane preface by the author, in which it is stated that "the entire purpose of this presentation of the subject is to help the reader understand the 'why' of each procedure, and with such understanding to enable him to evolve a technic of his own, properly grounded on scientific principles." This he proceeds to do successfully. The book is not a compilation of the author's cases. First there are an explanation of the definitions and synonyms used and a brief and accurate history of the method. A chapter of careful and practical discussion of anatomic considerations follows. There is in this chapter a detailed account of the spinal and autonomic nervous systems which is of paramount importance and is referred to again and again in the text because the bulk of clinical and experimental evidence adduced indicates that fall in blood pressure, respiratory embarrassment or failure and cardiac insufficiency are truly the effects of the anesthetic drug on cord structures and their autonomic counterparts. The selectivity of most anesthetic agents is on sensory components predominantly in the concentrations ordinarily used. Most of the untoward events therefore are the results of gravitation of the anesthetic to nerve roots controlling the muscles of respiration, the sympathetic acceleration of the heart and the peripheral nervous vasomotor control. The physical factors in the administration of spinal anesthetics are reviewed, as are the actions of drugs that have been or are being employed as anesthetic agents for premedication and stimulation during anesthesia. A discussion of technical considerations is followed by the recording of specimen technics. These include all the well known methods. The author has no particular ax to grind and does not give the impression that he has any interest in wanting to persuade the reader to adopt his technic (which in fact is similar to that used by many other operators).

The effects of anesthesia are dealt with, and here the earlier experimental and clinical groundwork is repeatedly referred to in the explanation of the phenomena observed during and after anesthesia. The cause of failures is (again) shown to be failure to deposit the anesthetic in the subarachnoid space in the vast majority of cases, although hyposensitivity to ordinary concentrations is thought to be a rare cause. Difficulties of administration and dangers to be watched for are described and the causes of death analyzed. Maxson is certain that, when handled by a well qualified anesthetist, spinal anesthesia is "as safe as any method can be." One believes him when he states that it would be his own choice had he to undergo an abdominal operation.

There is obvious sincerity about the book, and one gathers that the same might be said about the author. He records his own deaths in detail and gives all the mortality statistics which have been reported since 1915, making the point that most deaths have occurred early in the given series. Complications and sequelae, advantages and disadvantages, indications and contraindications are thoroughly considered, so that one may find almost any specific condition discussed from the standpoint of risk. The author considers spinal anesthesia to be of value at times as an aid in diagnosis (although not all surgeons will be willing to agree that it should be used to differentiate mechanical from paralytic ileus), as a therapeutic agent in certain conditions and as an anesthetic agent in some special situations, such as childbirth. The application of the method in the surgical treatment of children and infants is discussed, the author's point of view being that it may have a use with older children but probably not under any ordinary circumstances with infants. In the same chapter preoperative and postoperative care of patients who have had a spinal anesthetic is presented. Total spinal anesthesia is discussed, chiefly for the purpose of warning against its dangers and by way of illustrating the selectivity of the drugs used for sensory nerves. Segmental spinal anesthesia is thought to have promising possibilities. The book closes with a brief chapter of conclusions, the first part of which might fittingly have introduced the treatise. In it the spirit in which the book was written is indicated by the statement that "the writer of this book is not an extremist in his attitude toward spinal anesthesia. He cannot share the high enthusiasm of a Pitken, a Koster or a Vehrs. . . . No; the writer is an anesthetist, and as such he recognizes that no single method of anesthesia can properly claim precedence and be used to the exclusion of the others."

There are an extensive bibliography and a name and cross reference subject index. The contents are made easily available by outlines under the headings of each chapter. There is considerable repetitious presentation of material in the book, but this is not objectionable, since each chapter is dealt with as a unit. It should be pointed out that if all those who administer spinal anesthetics had the knowledge contained in this book and understood how to apply it, spinal anesthesia would never fall into disrepute but would have an honored place in the practice of surgery until the advent of the perfect anesthetic.

Der Beginn der Lungentuberkulose beim Erwachsenen. Untersuchungen an 86 Reihen von Röntgenphotographien von Gesunden bis zum Krankhaften über Ursache, Gestalt, Entwicklungstempo, therapeutische Beeinflussbarkeit und Prognose der Erkrankung. Von Dr. H. Braeuning, Chefarzt der Fürsorgestelle für Lungenkranke in Stettin. Paper. Price, 22 marks. Pp. 222, with 177 illustrations and graphs. Leipzig: Georg Thieme, 1938.

This excellent monograph is printed on the best glazed paper and is well illustrated with roentgenograms and charts. There are a few minor typographic errors: some of the tables (for example, table 3) have duplication, figures do not total, and reference figures in the text are not exact. On page 180 for table 17 undoubtedly table 18 is meant. The use of flat plates also has the disadvantage of not locating lesions by third dimension and requires a careful regulation of the relationship of position of the x-ray tube to the position of each patient.

The work is the result of a study of 100,000 persons, of whom there were 80,000 roentgenograms from the various tuberculosis institutions of Stettin. Of this number only eighty-six cases were included in the report in which roentgenograms were taken in series of apparently well persons and the disease was observed from the inception as determined by the least possible changes on the roentgenograms. The periods from the last normal to the first one showing pathologic change varied from one month to one year. The important features of the course of the disease of each of these eighty-six patients is briefly recorded, accompanied by an excellent course chart of each and punctuated by well chosen roentgenograms of total or important lung regions. There are eighty-five of such reproductions. In this series the author's dictum of "anything can happen" is well shown, for there are many degrees of acuity and chronicity. Some cases presenting open infiltrates or other serious appearance heal spontaneously, others like them or of even better

appearance may go on to a fatal issue even with treatment. The first appearance, therefore, is not always a good criterion of prognosis.

Fifteen per cent of the cases became open within the first year, 5 per cent more after the second year, 4 per cent more after the third, and 8 per cent more after the fourth. After twelve years 40 per cent were open. Three and five tenths per cent of the patients were dead after one year and 15 per cent after twelve years. Both of these figures are established on an average time of observation of about four years. Sixty per cent therefore became severely damaged for years, 40 per cent infectious and 15 per cent died. If they had been followed longer the results would perhaps be much higher. Judging by the author's earlier work, about 80 per cent of patients with open tuberculosis ultimately die of the disease, although this is subject to rigid interpretation of what constitutes an open lesion and also the kind and time of treatment. Truly, as the author states, tuberculosis in adults, for those who know its course, has not yet lost its terror. The blood picture is indefinite, as is the red cell sedimentation. Neither is specific. Practically all acute forms show changes of both, some chronic forms show changes of neither.

The high point of this work lies in the report on the early lesion from a roentgenologic standpoint with the collateral clinical observations.

The preponderance of lesions were infiltrates: twenty-six typical, thirty-four atypical or modified in some way, twelve having mixed flecks in cloudy infiltrates and others having fine flecks with or without linear fibrosis. They were located largely above the second rib: eighteen in the apex, six behind the clavicle, twenty in the first, five in the second intercostal space and one in the third. The others were widespread or irregular in position.

Other diseases could not be connected as causative factors in the beginning of tuberculosis. Grip and the acute onset of tuberculosis are quite similar and may be simultaneous or independent of each other. A differential diagnosis is suggested in the high sedimentation of grip in contrast to tuberculosis.

The author doubts whether pregnancy has any unfavorable effect on the course of beginning tuberculosis, but the figures are too few to justify conclusions. Most figures of pregnancy and tuberculosis are compiled on cases in which the disease is actually in progress.

In puberty there is a slight increase of unfavorable results in the group from 10 to 20 years of age over the adults (50 per cent to 34 per cent respectively), but most puberty cases show a youthful glow even in advanced disease.

The origin of the disease is assumed to be largely from exogenous reinfection. Only three cases were definitely proved to be from a primary focus of thirty-six definite primary lesions. Three others were from the hematogenous scattering of the primary, but the author prudently admits that many such cases may have been overlooked and grants that pathologic studies similar to those of Wurm may change the figures. Important argument in favor of exogenous reinfection, however, is that seven times as many nurses in tuberculous cases develop the disease as those working in welfare stations. This is of more significance since all their nurses reacted positively to tuberculin at the beginning of service.

This work comes near to the ideal "experiment" in the epidemiology of tuberculosis.

The 1938 Year Book of Physical Therapy. Edited by Richard Kotáček, M.D., Clinical Professor and Director of Physical Therapy, New York Polytechnic Medical School and Hospital, New York. Cloth. Price, \$2.50. Pp. 186, with 131 illustrations. Chicago: Year Book Publishers, Inc., 1938.

This is the initial yearbook of physical therapy, aimed to serve the large body of medical men and their assistants in the use of physical energies in almost every field of medical practice. The editor states that he was attempting to meet "the constantly increasing, and in many respects spectacular, development of physical energies in the treatment of disease and injury during recent years." He says further that he wished to cover three main fields in physical therapy, namely (1) new developments in basic research and practical application, (2) the present status of clinical usage and (3) the types of treatments largely unknown in this country, in order to stimulate interest and

research along such lines as health resorts and spas, the use of natural therapeutic resources and climatotherapy, and physical education in the practice of medicine.

The book has two parts, one on the methods and apparatus of physical therapy, including some rather detailed accounts of the work of various investigators on the effects of physical methods, with some of the physiology and physics involved, and another on applied physical therapy in the treatment of a wide variety of physical conditions. The editor stressed the necessity of using physical therapy in conjunction with general medicine and surgery. In covering these fields, the literature referred to was limited to that of the preceding year, as is customary in yearbooks. In selecting articles from the foreign literature, the editor said that difficulty arose because of the lack of internationally accepted nomenclature, involving a problem which should be considered in future international congresses on physical therapy.

Dr. Kovács is the editor, yet it is sometimes uncertain which statements are his and which those of the investigators cited. Such objective comments are made as "the experiments proved that" and "the discussion is theoretical" and that certain experiments "have demonstrated." Yet comments signed by the editor are often placed in parenthesis and small print in the text, causing confusion as to which statements in the rest of the text are his and which those of the investigators cited.

On the whole the book represents a good start for a yearbook on physical therapy, and it will be valuable for its abstracts of recent literature.

Cardiovascular Disease in General Practice. By Terence East, M.A., D.M., F.R.C.P., Physician and Physician-in-Charge of Cardiological Department, King's College Hospital, London. Cloth. Price, 10s. 6d. Pp. 206, with 43 illustrations. London: H. K. Lewis & Co., Ltd., 1938.

This book it intended to expound to the general practitioner those principles and practices which are of immediate utility to him in his everyday handling of cardiac patients. In this the author succeeds admirably. Function and etiology are emphasized in preference to morphology; this is in line with the modern trend in the field of cardiovascular diseases. The scope of the book can be appreciated by a glance at the chapter headings: interpretation of symptoms, physical examination, heart failure and its treatment, coronary circulatory failure, peripheral circulatory failure, rheumatic and syphilitic cardiovascular disease, chronic valvular diseases, subacute endocarditis, pericarditis, hypertension, arrhythmias, circulation in anemia, in lung and kidney disease, in anesthesia, in pregnancy and in athletes, congenital heart disease, diseases of the arteries and veins, the heart in older persons, and aberrations of the normal heart. The book avoids the undue emphasis on chronic valvular disease which has been so common in the past by covering the subject in three pages. The style approaches that used in compends in a tendency to outline the subject and to employ a staccato rhetoric. Proprietary drugs are stressed unduly and many of these are unfamiliar to the American reader. The insertion of brief bare outlines of case reports could well have been omitted. These are, however, minor criticisms, and the book is admirably suited for the audience intended, the general practitioner of some experience seeking to be brought in easy lessons abreast of progress in this field.

Essentials of Psychiatry. By George W. Henry, Associate Professor of Psychiatry, Cornell University Medical College, New York. Third edition. Cloth. Price, \$5. Pp. 463. Baltimore: Williams & Wilkins Company, 1938.

Dr. Henry's excellent textbook has been considerably enlarged since its original appearance. Naturally the chapters dealing with the psychoses constitute the largest part. Borderline conditions cannot be dealt with in a book of this size. Perhaps more space is given to the topic of organic psychoses than is usually the case, but the matter is properly treated. The psychoneuroses are given a good deal of discussion. There is an excellent chapter on the method and purpose of mental examination, and a short but fairly good one on principles of treatment. Chapters on psychiatric nursing and psychopathology of the normal are included; those dealing with mental hygiene and disorders of childhood are perhaps too brief. Psychiatric social service work and the medicolegal

aspects of psychiatry are touched on, and the final chapter deals with psychiatric history, a subject which perhaps is too sketchily dealt with here but is unfortunately almost entirely neglected in other textbooks. There is a brief bibliography. This is a good, simple textbook and is accurate enough for use in the earlier parts of a curriculum in psychiatry. It could be used as a basic text in a psychiatric course in a medical college provided it was supplemented in the later years by intensive reading in the literature of psychiatry. The work of Rosanoff is perhaps better suited to advanced students of psychiatry. No textbook of course can be entirely satisfactory, but this volume is subject to a minimum of criticism if one bears in mind that an attempt is made to cover a great deal of material in a limited space.

Outline of Roentgen Diagnosis: An Orientation in the Basic Principles of Diagnosis by the Roentgen Method. By Leo G. Rigler, D.S., M.B., M.D., Professor of Radiology, University of Minnesota, Minneapolis. Atlas edition. Cloth. Price, \$6.50. Pp. 212, with 254 illustrations shown in 227 figures, presented in drawings and reproductions of roentgenograms. Figures 6 to 51 and 55 to 72 are drawings in an original technic by Jean E. Hirsch. Student's edition (exclusive of atlas). Paper. Price, \$3. Pp. 212. Philadelphia, New York, Montreal & London: J. B. Lippincott Company, 1938.

This work appears in two editions: one with illustrations, and the other, a cheaper work, minus the plates but containing the same text. Essentially this is an outline of a teaching course in radiologic diagnosis and represents the considerable experience of the author. The book is divided into eleven sections, fairly well running the gamut of diseases to which the human body is subjected and in which the x-rays are used for diagnosis. The first section is devoted to an outline of general principles with brief descriptions of technics employed in roentgenology. Actual practical technic has been completely eliminated; only a solid residue of diagnostic facts is presented. Nevertheless a surprising amount of discussion is present. An interesting feature is the paragraph in the various sections which evaluates the particular usefulness of the roentgenogram in the locale or disorder involved. The plates in the complete edition are excellent and it is easy for the reader to grasp the salient points portrayed. There are a few line drawings of the more difficult portions of osteology and of the development of the ossification centers of the bones. For those physicians and students who seek guidance to methodical and clearcut interpretation of fluoroscopic and roentgenographic appearances, this small volume cannot be too highly recommended.

The Medical Dictator and Other Biographical Studies. By Major Greenwood, F.R.S., D.Sc., F.R.C.P. Cloth. Price, 7s. 6d. Pp. 213, with 6 illustrations. London: Williams & Norgate, Ltd., 1936.

The author of this book is listed as former statistician to the Lister Institute, chairman of the statistical committee of the Medical Research Council, president of the Royal Statistical Society and professor of epidemiology and vital statistics at the London School of Hygiene and Tropical Medicine. Naturally he has made the acquaintance of "men long dead and largely forgotten whose work has influenced the studies" he pursues, and he has inquired into what sort of people some of these dead investigators were. The subjects of his present inquiry are Galen, John Freind, "Heart" Latham, William Farr, Pierre Charles Alexandre Louis, Osler, and Arthur William Bacot. "Medical dictator" is an appellation which he may rightly bestow on Galen but which seems inappropriate to some, if not all, of the other personalities. Thirty-four pages of biography and criticism of an ancient whose system was based on the doctrine that all diseases depend on the balance or lack of balance of the four primary humors—blood, yellow bile, black bile and phlegm—seem too much.

Of Pierre Charles Alexandre Louis, the author says that his principal writings are unreadable. They are just sums. Louis apparently endeavored to establish a numerical system of diagnosis and prognosis, to the exposition of which he devoted a special memoir of sixty-five pages. When Osler in 1905 wished to lay a wreath on the tomb of Louis, no physician could be found in France who knew where he was buried.

Farr was a statistician and discovered a law to which his name has been attached and which "was the simplest possible

relation between the three ratios deducible from the four available figures which one could assume." He was able to foretell when the cattle plague which invaded England in 1865 would reach its maximum. After Farr retired, the British Medical Association officially expressed appreciation of his labor in behalf of statistical and sanitary science, of the light he had thrown on physiologic and pathologic problems and of the extraordinary services he had rendered in advancing the national health.

Latham had been a member of the staff of old St. Bartholomew's and a successful practitioner in London. He was also a critic of medical education. He believed that all knowledge was valuable but that, for a physician, the study of sick people was much more valuable than anything else.

John Freind is one of the heroes of the London College of Physicians. He became physician to the queen after the accession of George II. His "History of Physic" was his most important work and yet he made no important contribution to the art or science of physic. He had no use for ancient medical philosophy or modern medical systems, but he searched the literature for plain, practical remedies with no mystical nonsense about them. He died in 1728. The reason why Freind was beloved can be expressed in one word, character.

Cancer with Special Reference to Cancer of the Breast. By R. J. Behan, M.D., Dr. Med., F.A.C.S. Cloth. Price, \$10. Pp. 844, with 168 illustrations. St. Louis: C. V. Mosby Company, 1938.

The author was formerly director of the cancer department of the Pittsburgh Skin and Cancer Foundation. Since he was unable to find in an abstracted form in a single monograph a description of the complex changes associated with the different phases of cancer, he began to collect, abstract, study and compile the principal facts and theories concerned with the etiology, diagnosis and treatment of cancer. The result was the present volume, which originally was written as a treatise on cancer of the breast. He reviews the advances in the study of cancer which seem to have substantial and positive foundations. He believes that our knowledge of the physiology and morphology of the cancer cell has about reached its limit of usefulness as a means of solving the cancer problem, that surgical intervention and irradiation have also reached the limits of their effectiveness, and that it is necessary for new methods of treatment to be developed from a study of the alterations in the biologic activity of the individual cancer cell. After a general consideration of the incidence and mortality of cancer in different countries and the relation of cancer to age and sex, he takes up the etiology, especially of cancer of the breast. Chapters followed on the pathology, symptomatology, diagnosis (including many so-called cancer tests), biopsy (including the technic), metastases and prognosis. Almost half of the book is given over to a consideration of the various forms of treatment. The author believes that the best results at present are obtained with a combination of surgical intervention and irradiation. In the treatment of cancer detailed consideration must always be given to the patient whose general state of health must be subjected to a critical investigation. The chapter on treatment is subdivided into sections on operative treatment, constitutional treatment and irradiation and includes a special section on the dosage of radioactive agents.

Air Conditioning: A Practical, Modern and Fundamental Treatise on the Subject of Air Conditioning, Air Distribution, Refrigeration, Comfort Cooling, Humidification and Air Purification. By Charles A. Fuller, M.E., Consulting Engineer on Air Conditioning, Heating and Ventilating, Electrical and Sanitary Equipment. With the collaboration of David Snow, Air Conditioning Engineer. Cloth. Price, \$4. Pp. 577, with 300 illustrations. New York: Norman W. Henley Publishing Company, 1938.

This is a practical and fairly complete treatise on the mechanics of air conditioning. Written primarily for students, contractors and practical engineers, it contains much fundamental information to meet the needs of beginners in the art. There is little on physiologic and health aspects of air conditioning that would interest the physician. Whatever is said about the need of humidification, ionization or deodorization appears to have been based on manufacturers' literature. The print is large and readable and the illustrations are good. The index is fair and there is no bibliography despite the liberal use of basic sources of information.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Ethmoidal Sinusitis Attributed to Trauma.—The claimant, in the course of his employment, was struck on the forehead with a piece of metal pipe. A lacerated wound resulted, about 1½ inches long and extending down to the skull. A physician sutured the wound and treated it "in the usual way" for about six days. The published report does not show whether roentgenograms were made. According to the physician who treated the claimant at the time, the wound healed readily and there was no apparent reason why it should give trouble. Except for six days immediately following the accident, the injured workman lost no time from work until September 1936. In the interval, however, he had suffered from headaches of increasing intensity, which had become so severe as to prevent his working full time. The record shows that he was treated for "ethmoid sinus infection," but it does not show when that condition was first recognized or present any direct evidence concerning it. When the injured workman realized that he could no longer work full time—that is, two years after the accident—he filed a claim for compensation under the workmen's compensation act of Texas against his employer's insurance carrier.

The industrial accident board denied him compensation because he had not shown "good cause" for not filing his claim within six months after the injury. The claimant thereupon instituted suit in the district court, Wichita County, to set aside the order of the industrial accident board. Judgment was entered in his favor, and the insurer thereupon appealed to the court of civil appeals of Texas, Forth Worth.

The insurer contended that the claimant, as a matter of law, had not shown "good cause," as required by law, for his failure to file his claim within six months after he was injured. The appellate court pointed out, however, that the courts of Texas had often held that the question as to whether or not there was good cause for a claimant having failed to file his claim for compensation was a question of fact to be determined by a jury if one was demanded, and that the test was whether or not the claimant prosecuted his claim with such diligence as would have been exercised by a person of ordinary care under the same or similar circumstances. Quoting from *Texas Employers' Insurance Association v. Clark*, 23 S. W. (2d) 405, 408, the court said:

That the employee did not believe his injuries to be serious would clearly afford a good cause for not giving notice and filing claim until it was learned they were serious. Compensation is not provided for pain and suffering, but for loss of wages, and there would arise no necessity for giving notice or filing a claim so long as the employee lost no time from his work, but believed his injuries were trivial.

The court could not properly have submitted to the jury an issue inquiring whether or not the claimant had shown good cause for not having sooner filed his claim; to have done so would have infringed the prerogative of the court. The court, however, submitted to the jury issues of fact on which the court might base its findings. The jury found that the claimant believed until about the time he filed his claim that the injuries would not disable him; that this belief prevented his filing his claim prior to the time when it was filed, and that a reasonably prudent person, situated as the claimant was, would have delayed the filing of his claim for a period as long as the claimant delayed in the present instance. The appellate court, therefore, refused to disturb the findings of the jury and of the trial court that good cause had been shown.

The insurer complained of the inadequacy of the testimony to support the finding of the jury that the claimant was totally and permanently incapacitated for work. The question, said the court, had to be determined from the opinions of experts among the medical profession, and it appeared to be as natural for them to disagree as it was for members of the legal profession. They seldom commit themselves to a positive statement that this or that injury to a part of the human anatomy will have a definite effect on the individual; they explain, and rightly so, said the court, that this is because of so many elements which

may enter into each case, such as infection, the physical condition of the person at the time of the injury, and many other like conditions. The medical witnesses had testified, in effect, from hypothetical questions put to them that the claimant could not pass the physical examination necessary to enable him to accept employment in the oil fields such as he had formerly engaged in. The physician treating the claimant for ethmoid sinus infection said that the blow on the claimant's head would probably produce such an infection, that in his opinion the claimant was incapacitated to do oil field work and that his incapacity was permanent. To constitute total incapacity, it is not necessary to establish as a fact that the claimant cannot do any kind of labor, it is sufficient if he is disqualified from performing the usual tasks of a workman in such a way as to enable him to procure and retain employment. There was ample evidence to support the finding of the jury favorable to the claimant.

The appellate court accordingly affirmed the judgment of the trial court in favor of the claimant—*Texas Employers Ins Ass'n v Roberts (Texas)*, 116 S W (2d) 417.

Medical Practice Acts: Treatment of Physical Deformity by Cosmetologist Constitutes Practice of Medicine.

—Three prosecutions were brought against Gardner, charging that he practiced medicine without having been licensed so to do. From three judgments of conviction, he appealed to the court of criminal appeals of Texas. Gardner admittedly had treated one Lato, the muscles about one of whose eyes had become stretched from the prolonged use of a loupe (a type of magnifying glass which fits over the eye), "causing the skin and flesh to sag down." Lato testified that he consulted Gardner concerning this condition. Gardner put some "stuff" that smelled like chloroform around Lato's eye to kill the pain and then placed "a strong acid" around the eye, which burned the patient and caused such severe swelling as almost to close the eye. Gardner continued to treat Lato for about four weeks and Lato paid him \$75 for his services. Gardner claimed that what he had done was not the practice of medicine but had been done pursuant to the practice of cosmetology, which he was licensed to practice. He had used no chloroform nor acid, he said, but had applied only a "beauty peel," purchased by him in a drug-store.

In the judgment of the court, Gardner's acts constituted the practice of medicine within the meaning of the medical practice act of Texas, which declares, among other things, that any person shall be regarded as practicing medicine who treats or offers to treat any physical deformity or injury, by any system or method, or offers to effect cures thereof and charges therefor. The court affirmed the three judgments of conviction—*Gardner v State (Texas)*, 116 S W (2d) 402, *Same*, 116 S W (2d) 403, *Same*, 116 S W (2d) 403.

Society Proceedings

COMING MEETINGS

American Medical Association, St. Louis, May 15-19 Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.
American Academy of Tuberculosis Physicians, St. Louis, May 13-14 Dr. Arnold Minning, 638 Metropolitan Bldg., Denver, Secretary.
American Association for the Study of Gout, Cincinnati, May 22-24 Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
American Association for Traumatic Surgery, Hot Springs, Va., May 8-9 Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.
American Association of Genito-Urinary Surgeons, Williamsburg, Va., May 24-26 Dr. Charles C. Higgins, 2050 East 93d St., Cleveland, Secretary.
American Association of Industrial Physicians and Surgeons, Cleveland, June 5-8 Dr. V. S. Cheney, Armour and Company, Union Stock Yards, Chicago, Secretary.
American Association of the History of Medicine, Atlantic City, N. J., April 30-May 1 Dr. Henry E. Sigerist, 1900 Monument St., Baltimore, Secretary.
American Association on Mental Deficiency, Chicago, May 3-6 Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
American Bronchoscopic Society, Rye, N. Y., May 26 Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.
American College of Chest Physicians, St. Louis, May 13-14 Dr. Robert B. Homan Jr., 109 North Oregon St., El Paso, Texas, Secretary.
American Dermatological Association, Montebello, Canada, May 31-June 3 Dr. Fred D. Weidman, University of Pennsylvania Medical Laboratories, Philadelphia, Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., May 12 Dr. Russell S. Boles, 1901 Walnut St., Philadelphia, Secretary.
American Gynecological Society, White Sulphur Springs, W. Va., May 22-24 Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.
American Heart Association, St. Louis, May 12-13 Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.
American Laryngological Association, Rye, N. Y., May 24-26 Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.
American Laryngological, Rhinological and Otolological Society, Chicago, May 10-11 Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.
American Neurological Association, Atlantic City, N. J., June 5-7 Dr. Henry A. Riks, 117 East 72d St., New York, Secretary.
American Ophthalmological Society, Hot Springs, Va., June 5-7 Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.
American Orthopedic Association, Buffalo, N. Y., June 5-8 Dr. Ralph K. Gormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
American Otolological Society, New York, May 22-23 Dr. Thomas J. Harris, 104 East 40th St., New York, Secretary.
American Psychiatric Association, Chicago, May 8-12 Dr. Arthur H. Ruggles, Butler Hospital, Providence, R. I., Secretary.
American Radium Society, St. Louis, May 15-16 Dr. Frederick W. O'Brien, 465 Beacon St., Boston, Secretary.
American Rheumatism Association, St. Louis, May 15 Dr. Loring T. Swann, 372 Marlborough St., Boston, Secretary.
American Society for Clinical Investigation, Atlantic City, N. J., May 1 Dr. LeRoy Spurr, University of Pennsylvania Hospital, Philadelphia, Secretary.
American Society for the Study of Allergy, St. Louis, May 15-16 Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.
American Society of Clinical Pathologists, St. Louis, May 12-14 Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.
American Surgical Association, Hot Springs, Va., May 11-13 Dr. Charles G. Mixer, 319 Longwood Ave., Boston, Secretary.
American Therapeutic Society, St. Louis, May 12-13 Dr. Joseph F. Elward, 1726 E. St. N.W., Washington, D. C., Secretary.
American Urological Association, White Sulphur Springs, W. Va., May 29-June 1 Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.
Arkansas Medical Society, Hot Springs National Park, May 8-10 Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.
Associated Anesthetists of the United States and Canada, St. Louis, May 13 Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary General.
Association for the Study of Internal Secretions, St. Louis, May 13-14 Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.
Association of American Physicians, Atlantic City, N. J., May 23 Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.
Association of Military Surgeons of the United States, Washington D. C., May 8-10 Dr. H. L. Gilchrist, Army Medical Museum, Washington D. C., Secretary.
California Medical Association, Del Monte, May 14 Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.
Connecticut State Medical Society, New Haven, May 25-26 Dr. Creighton Barker, 258 Church St., New Haven, Secretary.
Florida Medical Association, Daytona Beach, May 13 Dr. Staker Richardson, 111 W. Adams St., Jacksonville, Secretary.
Illinois State Medical Society, Rockford, May 24 Dr. H. M. Camp, 224 S. Main St., Monmouth, Secretary.
Kansas Medical Society, Topeka, May 14 Mr. C. G. Munus, 112 W. 6th St., Topeka, Executive Secretary.
Massachusetts Medical Society, Worcester, June 6-8 Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.
Minnesota State Medical Association, Minneapolis, May 31-June 2 Dr. B. B. Souster, 11 West Summit Ave., St. Paul, Secretary.
Mississippi State Medical Association, Gulfport, May 9-11 Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.
National Gastroenterological Association, New York, June 12 Dr. G. Randolph Manning, 1819 Broadway, New York, Secretary.
Nebraska State Medical Association, Grand Island, May 24 Dr. R. B. Adams, 414 Federal Securities Bldg., Lincoln, Secretary.
New Hampshire Medical Society, Manchester, June 8-9 Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.
New Jersey, Medical Society of, Atlantic City, June 6-8 Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.
New Mexico Medical Society, Gallup, May 11-13 Dr. L. B. Cohenour, 219 W. Central Ave., Albuquerque, Secretary.
New York State Association of Public Health Laboratories, Valhalla, May 8 Miss Murry B. Kirkbride, New Scotland Ave., Albany, Secretary.
North Carolina, Medical Society of the State of, Cruise to Bermuda, May 9-14 Dr. T. W. M. Long, Roanoke Rapids, Secretary.
North Dakota State Medical Association, Fargo, May 8-10 Dr. Albert W. Skelsey, 20½ North Broadway, Fargo, Secretary.
Ohio State Medical Association, Toledo, May 3-4 Mr. C. S. Nelson, 79 E. State St., Columbus, Executive Secretary.
Oklahoma State Medical Association, Oklahoma City, May 13 Dr. L. S. Willour, Third and Semmole, McAlester, Secretary.
Pacific Coast Oto Ophthalmological Society, San Francisco, June 19-22 Dr. C. Allen Dickey, 450 Sutter St., San Francisco, Secretary.
Rhode Island Medical Society, Providence, June 7-8 Dr. Guy W. Weil, 124 Waterman St., Providence, Secretary.
Society of Surgeons of New Jersey, Elizabeth, May 25 Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.
Texas, State Medical Association of, San Antonio, May 8-11 Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.
Vancouver Medical Association Summer School, Vancouver, B. C., June 6-9 Dr. W. W. Simpson, 203 Medical Dental Bldg., Vancouver, B. C., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Huntington, Ind.

5: 777-850 (Feb.) 1939

Effect of Anterior Pituitary-like Hormone on Gastric Acidity in Man. H. Felson and L. Schiff, with technical assistance of Ellen S. Garber, Cincinnati.—p. 777.

*Observations on Incidence and Cause of Fever in Patients with Bleeding Peptic Ulcers. L. V. Dill and C. E. Isenhour, Nashville, Tenn.—p. 779.

Effect of Pyloric Obstruction on Filling and Emptying of the Gallbladder in Cholecystography. M. Feldman, Baltimore.—p. 785.

History and Development of Gastric Analysis Procedure (Second Installment). F. Hollander and A. Penner, New York.—p. 786.

Disposable Nonbreakable Hard Enema Tip. M. Kraemer, Newark, N. J.—p. 791.

Attempt to Prevent Postoperative Jejunal Ulcer by Aluminum Hydroxide Therapy: Experimental Study in Mann-Williamson Dogs. G. B. Fauley, A. C. Ivy, L. Terry and W. B. Bradley, Chicago.—p. 792.

*Chronic Localized Gastric Purpura. R. Schindler, Chicago.—p. 796.

Review of Some Foreign Literature. R. Schindler, Chicago.—p. 799.

Problems of Maintaining Nutrition in the Highly Food-Sensitive Person. W. C. Alvarez, Rochester, Minn.—p. 801.

Peritonitis Due to Ruptured Acute Appendicitis in Children: Influence of Delay on Operative Mortality. R. Elman, St. Louis.—p. 804.

Pellagra Treated with Nicotinic Acid: Report of Ten Cases. V. H. Musick, Oklahoma City.—p. 807.

Studies on Water and Soap Enemas. R. D. Templeton and E. L. Borkon, Chicago.—p. 809.

Anorexia and Gastric Motility. Dorothy P. Gulliksen, Alma Fogelberg and L. Kardos, Chicago.—p. 814.

Fever in Peptic Ulcer.—Dill and Isenhour determined the incidence of fever (any rise in temperature above 99 F. which was sustained for more than two days, any rise to 99.2 F. or above for two days or any single rise exceeding 100 F.) in 199 male patients with proved peptic ulcers. Each patient had been observed in the hospital for more than three days and was known, within the limits of error, to have no intercurrent infection. The authors state that the incidence of fever in their patients (53 per cent) is identical with the series published by Bang but greatly exceeds those of Kroner (18 per cent) and Lorenz (24 per cent). They found that 80 per cent of their patients with bleeding ulcers were febrile. These figures do not differ greatly from those of Purjesz (73 per cent) or Bang (91 per cent) but are well above those quoted by Kroner (58 per cent). Their percentage of febrile, nonbleeding ulcer cases (46 per cent) is much higher than that of Kroner (16 per cent) or of Bang (7 per cent). Patients without demonstrable organic lesions had fever, according to the authors' definition, in a significantly high percentage (37.1). Their study shows that patients with ulcers have fever more frequently than patients with no demonstrable organic lesion and that bleeding increases this tendency. The presence of anemia also increases the febrile tendency in patients with both bleeding and nonbleeding ulcers. Massive and moderately severe hemorrhages are more frequently associated with fever than are small hemorrhages. The occurrence of fever could not be correlated with either the age of the patient or the duration of ulcer symptoms. The absence of leukocytosis in the patients led the authors to assume that infection of the base of the ulcer or an associated gastritis or duodenitis is not important in the production of fever. Experimental evidence seems to indicate that little part is played in the production of fever by either blood in the intestinal tract or absorption of blood degradation products. There was relatively high incidence of fever in patients with gastric neuroses.

Chronic Localized Gastric Purpura.—Schindler believes that chronic localized purpura of the stomach is not only a new but also an important disease. Gastroscoically, besides the more or less numerous mucosal hemorrhages, dark brown round or star-shaped spots may be found. They are usually from 2 to

5 mm. in diameter but occasionally much larger. They apparently develop from the mucosal hemorrhages; the transition may be observed if the patient is examined with the gastroscope at frequent intervals. Hemorrhages and pigment spots may be found along the anterior and posterior wall but are most frequently in rows along the lesser curvature. The common site of their location is a point about 3 cm. above the angulus. The pigment spots disappear slowly, probably by absorption. However, some hemorrhages, instead of being absorbed, become ulcerated and develop into a hemorrhagic erosion, red, grayish red or brownish red. Gastroscoy has verified the observation that true hemorrhagic erosions do exist. By the fact that they may become ulcerated, the eruptions of the localized purpura of the stomach are definitely different from the cutaneous eruptions in generalized purpura. This difference is easily explained. In the stomach the acid gastric juice developing peptic power is present, in which case the gastric wall may lose its autoprotective power against autodigestion if it is damaged for a long time by some disturbance of the circulation. The frequent coincidence of such isolated gastric purpura with true gastroduodenal ulcer does not prove that hemorrhagic erosion is the acute stage of chronic gastroduodenal ulcer. Chronic inflammation in stomachs containing true gastroduodenal ulcer is apparently secondary to the ulcer. However, the presence of noninflammatory gastric hemorrhages is not easily explained by assuming that they are effected by the ulcer, it would be difficult to explain why they are so often found at the place of predilection of ulcers (the angulus), and finally the author believes that he has observed the transition of mucosal gastric hemorrhages into true gastric ulcer. Therefore his opinion is that (1) there is a definite relationship between chronic localized gastric purpura and chronic gastroduodenal ulcer, (2) chronic isolated gastric purpura may precede or follow chronic gastroduodenal ulcer or they may be found together and (3) the hemorrhagic erosion, having its origin from the chronic localized gastric purpura by the peptic quality of the gastric contents, may be the acute stage of chronic gastroduodenal ulcer.

American Journal of Hygiene, Baltimore

29: 1-60 Section A (Jan.) 1939. Partial Index

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1-46 Section D

Section A

Cobalt Content of Some Food Materials from Different Parts of the United States. B. Ahmad and E. V. McCollum, Baltimore.—p. 24.

Importance of Field Studies of Leprosy, with Especial Reference to the Risk of Household Exposure. J. A. Doull, Cleveland.—p. 27.

*Cancer in the United States Navy. S. Peller, Baltimore, and C. S. Stephenson, Washington, D. C.—p. 34.

Section B

Further Studies on Biochemical and Serologic Varieties of Salmonella Typhi-Murium. P. R. Edwards and D. W. Bruner, Lexington, Ky.—p. 24.

Physiologic Effects of Garlic and Derived Substances. M. Carl, R. S. McKnight, B. Scott and C. C. Lindegren, Los Angeles.—p. 32.

Section C

Serum Potassium Level in Trypanosoma Equiperdum Infection in Rats: Role of Potassium in Death from This Infection. R. L. Zwemer and J. T. Culbertson, New York.—p. 7.

Section D

Investigation Concerning the Status of Hookworm in Florida. W. S. Leathers, A. E. Keller, Nashville, Tenn., and W. A. McPhaul, Jacksonville, Fla.—p. 1.

Studies on Oxyuriasis. XII. Epidemiologic Findings in Washington, D. C. Eloise B. Cram and Lucy Reardon, Washington, D. C.—p. 17.

Immunization of Dogs Against Hookworm, Ancylostoma Caninum, by Subcutaneous Injection of Graded Doses of Living Larvae. G. F. Otto and K. B. Kerr, Baltimore.—p. 25.

Cancer in the Navy.—Peller and Stephenson deal with a study of the cancers that occurred in the United States Navy during the years 1929 to December 1936. During this period there were 320 deaths from cancer. Of these, ninety-eight men were in active duty status, in seventeen additional persons the onset of the malignant condition was during active service but they died following discharge from the navy and 205 of these cases occurred in men in an inactive duty status. Compared to civil populations there are many more surface cancers in the navy personnel and fewer internal cancers. Since the former are easily cured, the average case fatality of all cancers (about 50 per cent) is low. Owing to the greater frequency of cuta-

neous cancers and lesser frequency of internal ones, the mortality between the ages from 25 to 64 is about 50 per cent lower than would be expected from age, sex and color-specific cancer rates of New York for 1930. The cutaneous and lip cancer morbidity among active navy personnel is several times as high as in the civil population. This is explained by greater exposure to cutaneous irritants, especially sun, salt water and wind. Since total morbidity in the active personnel and total mortality in the ages above 65 are not higher than in the civil population, the conclusion seems to be justified that increased exposure to the sun is beneficial rather than detrimental.

American Journal of Medical Sciences, Philadelphia

197: 141-280 (Feb.) 1939

- The Alleged Dulness Over the Apex of the Normal Right Lung. W. Coleman, New York.—p. 141.
- Role of Vibration Sense in Percussion. W. Coleman, New York.—p. 145.
- *Specific Treatment of Pneumococcus Type I Pneumonia, Including Use of Horse and Rabbit Antipneumococcus Serums and Sulfanilamide. M. Finland, Boston, and J. W. Brown, San Francisco.—p. 151.
- Sulfanilamide in Treatment of Gonococcal Arthritis. C. S. Keefer and L. A. Rantz, Boston.—p. 168.
- Clinical Studies in Circulatory Adjustments: V. Clinical Evaluation of Cardiodynamic Studies. A. A. Goldbloom and A. Lieberman, New York.—p. 182.
- Movements of Roentgen-Opaque Deposits in Heart Valve Areas: II. Excursion of Apex and Base of Left Ventricle Compared with That of Left Border. C. C. Wolferth and A. Margolies, Philadelphia.—p. 197.
- Histologic Investigation into the Pyloric Gland Organ in Pernicious Anemia. E. Meulegracht, Copenhagen, Denmark.—p. 201.
- Erythremia, Gout and Subleukemic Myelosis: Case. G. H. Reifstein, Boston.—p. 215.
- Mechanism of Compensatory Changes in Anemia, Especially as Regards Blood Carbon Dioxide and Hydrogen Ion Concentration. F. L. Apperly and M. K. Cary, Richmond, Va.—p. 219.
- *Blood Plasma Ascorbic Acid in Patients with Achlorhydria (Pernicious and Iron Deficiency Anemia). H. L. Alt, H. Chinn and C. J. Farmer, Chicago.—p. 229.
- Fatal Bacterial Endocarditis Due to Salmonella Suipetifer. D. E. Forster, Portland, Ore.—p. 234.
- Use of Electrocardiographic Changes Caused by Induced Anoxemia as Test for Coronary Insufficiency. R. L. Levy, H. G. Bruenn and N. G. Russell Jr., New York.—p. 241.
- Serologic and Immunologic Studies Relative to the Viruses of Human and Swine Influenza. Dorothy R. Shaw, A. S. Kenney, New Orleans, and J. Stokes Jr., Philadelphia.—p. 247.
- *Complement Fixation Studies on the Serums of Individuals Vaccinated with Active Virus of Human Influenza. A. P. Morrison, Dorothy R. Shaw, A. S. Kenney, New Orleans, and J. Stokes Jr., Philadelphia.—p. 253.

Specific Treatment of Type I Pneumonia.—Finland and Brown state that the death rate among cases of type I pneumococcus pneumonia treated with concentrated type specific antibody at the Boston City Hospital has been regularly one half or less that of similar contemporaneous cases not treated with serum. This has remained true in recent years in spite of the fact that the proportion of cases treated with serum has increased from 43 to 89 per cent. In the cases treated with serum before the end of the fourth day of illness the death rate is less than one third of that which occurs in cases not treated with serum. Bacteremic and nonbacteremic cases are equally influenced. The greatest reduction in the death rate occurs in patients less than 50 years of age, but those of other age groups are probably also beneficially affected by serum treatment. Empyema occurred after serum treatment chiefly in bacteremic patients, and its frequency was proportional to the delay in beginning treatment. Type I antipneumococcus serums produced in both horses and rabbits were potent and effective. There are insufficient data to indicate any superiority of the one over the other. Sulfanilamide in the small number of cases in which it was used alone or with serum influenced the course of type I pneumonia only slightly if at all.

Ascorbic Acid in Plasma in Achlorhydria.—In order to obtain further information on the concentration of ascorbic acid in the blood of patients with achlorhydria, Alt and his co-workers determined the ascorbic acid of the blood plasma in forty-four cases of achlorhydria associated with pernicious or iron deficiency anemia. The results in general seem to confirm the hypothesis that a relationship exists between achlorhydria and vitamin C deficiency. With diets adequate in vitamin C, the mean blood ascorbic acid was significantly decreased from the normal in the cases of pernicious anemia but not in the iron deficiency anemia group. With diets inade-

quate in vitamin C the plasma ascorbic acid was significantly decreased from that observed in twenty-four controls, in both the pernicious and the iron deficiency anemia groups. The plasma ascorbic acid values showed no correlation with the erythrocyte counts and hemoglobins. Experiments were performed in an attempt to explain why there might be an association between vitamin C deficiency and achlorhydria, but none established an explanation for such an association. Possibly a combination of such factors as lack of an acid gastric juice, bacterial growth and malabsorption might be sufficient to interfere with the assimilation of ascorbic acid in such cases.

Active Virus of Human Influenza.—Morrison and his associates studied the effect of active human influenza virus on the complement fixing antibodies of the serums of patients vaccinated with it. They compared this with a similar and simultaneous study of the serums of a group of nonvaccinated controls. The serums of the same individuals were studied over a period of from one to two years under similar environmental conditions but in the presence of a variety of intercurrent respiratory infections. Constantly low titers of complement fixing antibodies were found in the same individual over a long period if no infection with influenza virus had occurred and even though they had suffered from other types of respiratory infection. Such low titers persisted among the hospital personnel in a large urban center as well as in the more isolated sections studied. Repeated vaccination with chick embryo tissue culture vaccine as prepared in large batches for injection did not affect the complement fixing antibodies. If the complement fixing antigen is a soluble substance liberated during multiplication of the virus in the tissues it is also possible that the use of infected mouse lung rather than chick embryo tissue culture vaccine might result in an increase in the complement fixing antibodies. Vaccine derived from chick embryo tissue cultures following parenteral injection produced characteristic increases in the neutralizing properties of serums. By the same route, in mice, it also produced immunity to the virus injected as well as cross immunity to other strains of human influenza virus. In a few instances marked elevation in titer of complement fixing antibodies studied in the serums of individuals following hospitalization established the cause of their respiratory infections as epidemic influenza. Such increases were absent following other types of respiratory infection. By such studies future epidemics of respiratory disease may be more satisfactorily classified as to etiology.

American Journal of Psychiatry, New York

95: 769-1006 (Jan.) 1939. Partial Index

- Pharmacologic Shock Treatment of Schizophrenia: Statistical Study of Results in the New York State Hospitals. J. R. Ross, Wingdale, N. Y.—p. 769.
- Use of Metrazol in the Functional Psychoses. C. F. Read, D. L. Steinberg, E. Liebert, Elgin, Ill., and I. Finkelman, Chicago.—p. 781.
- Results to Date with Pharmacologic Shock Treatment of Schizophrenia. K. M. Bowman, J. Wortis, H. Fingert and Julia Kagan, New York.—p. 787.
- Insulin Treatment in Schizophrenic Patients: Clinical and Biochemical Studies. S. Katzenbogen, Baltimore; H. E. Harns, Catonsville, Md.; Ruth Willmans, S. Barkoff, M. W. Brody and M. Hayman, Sykesville, Md.—p. 793.
- Correlation of Insulin Shock and Convulsive States Relative to Symptoms and Site of Greatest Disturbance in the Central Nervous System. S. D. Ingham, J. M. Nielsen and K. O. von Hagen, Los Angeles.—p. 819.
- Analogies and Opposites in Schizophrenia and Epilepsy: Electroencephalographic and Clinical Studies. H. H. Jasper, C. P. Fitzpatrick, Providence, R. I., and P. Solomon, Boston.—p. 835.
- *Paucity of Arthritis Among Psychotic Cases. D. Gregg, Wellesley, Mass.—p. 853.
- *Constitutional Differences Between Deteriorated and Nondeteriorated Patients with Epilepsy: II. Anthropometric Measurements. H. A. Paskind and M. Brown, Chicago.—p. 901.
- Results of Eighteen Months of Benzedrine Sulfate Therapy in Psychiatry. E. Davidoff and E. C. Reifstein Jr., Syracuse, N. Y.—p. 945.
- Fatal Cases of Acute Manic-Depressive Psychosis. C. P. Larson, Tacoma, Wash.—p. 971.

Paucity of Arthritis in Psychosis.—Gregg presents the morbidity rates of arthritis in Massachusetts and among psychotic persons in the Massachusetts state hospitals. It has been stated that approximately 145,000 individuals in Massachusetts suffer from rheumatism. A similar prevalence among psychotic persons does not coincide with the author's experience or with the opinions of other hospital superintendents whom he consulted. To obtain more definite information, he sent a ques-

tionnaire to hospital superintendents, and from the first eight state hospitals and from one United States Veterans' hospital in Massachusetts the reports gave four bedridden and sixteen seriously handicapped patients with arthritis among more than 15,000 patients in these nine hospitals. Two of these twenty patients were less than 40 years of age and in eight of the remaining eighteen arthritis developed before entrance to the hospital. Whether this means that the arthritis antedated the psychosis is unknown. Assuming that the data are comparable, the incidence of disabling arthritis is seventeen times greater in the community than among psychotic patients in Massachusetts state hospitals. Evidence obtained by other investigators that confirms the discrepancy of the incidence of arthritis in the two groups is presented. Among psychotic patients without a prolonged stimulus-reaction span, because of impaired imagination and memory, there is little prolonged muscle tension or drag on the joints, little setting of the stage for prolonged ischemia, malnutrition or infection of the joints and therefore seldom chronic arthritis.

Body Build Differences in Epilepsy.—In order to determine whether differences exist in body habitus of deteriorated and nondeteriorated epileptic patients, Paskind and Brown took anthropometric measurements of fifty deteriorated and thirty-nine nondeteriorated epileptic patients. Eighty measurements were recorded for each patient according to the technic described by Martin, Saller and Draper. Fifty-seven indexes were also calculated for each patient to show the relation in size existing between a given part of the body and other parts. With few exceptions the mean values for the various measurements are greater in the deteriorated patients. Significant differences also exist in the mean values of the indexes. All indexes relating weight to height indicate that the deteriorated patients are heavier per unit of height and that their trunks are wider and deeper per unit of height than are those of the nondeteriorated patients. The deteriorated patients have narrower faces per unit of face height than do the nondeteriorated ones. Trunk and entire body measurements and indexes of exceptional size (large or small) occur more frequently in the nondeteriorated patients, whereas values of unusual size in head, hand and foot measurements and indexes occur more often in the deteriorated patients.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

41:1 144 (Jan) 1939

- Visualization of the Chambers of the Heart the Pulmonary Circulation and the Great Blood Vessels in Man. Practical Method. G P Robb and I Steinberg, New York—p 1
- Ventriculography of the Fourth Ventricle. E Lysholm, Stockholm, Sweden—p 18
- Röntgen Diagnosis and Treatment of Angioma of Tympanic Cavity. A O Hampton and D A Sampson, Boston—p 25
- Ventricular Aneurysm. Roentgenographic and Postmortem Surveys. J B Schwedel and H Gross, New York—p 32
- Respiratory Motion of Lung During Artificial Pneumoperitoneum Treatment. Roentgenologic Study. A L Banyai, Wauwatosa, Wis—p 37
- Pancreatic Lithiasis. Report of Case. C L Gillies, Iowa City—p 42
- Skeletal Metastasis in Testis of Testicle. Report of Two Cases. S K Livingston, Hines Ill—p 47
- Gross Morphology of Cervical Cancer in Relation to Its Curability. T R Hofmann, San Francisco—p 51
- *Survey of 293 Cases of Cancer of the Cervix Uteri 223 of Which Were Treated from 1916 to 1933 by Radiation Therapy at Grace Hospital. Detroit. R H Stevens and A K Payne, Detroit—p 55
- Significance of Urologic Surveys in Cervical Carcinoma. W E Howes and H Strauss, Brooklyn—p 63
- Management of Major Complications During Radium Therapy of Carcinoma of Cervix. H H Bowing and R E Fricke, Rochester, Minn—p 69
- Aids to Irradiation in Management of Carcinoma of the Cervix Uteri. L A Pomeroy, Cleveland—p 73
- Treatment of Injuries Produced by Roentgen Rays and Radioactive Substances. E Uhlmann, Istanbul, Turkey—p 80
- Inheritance Structure of the Cell and Its Relation to Irradiation Effects. J W Gowen, Ames, Iowa—p 91
- Scheme of Protection Which Has Proved Satisfactory in a Large Radium Therapy Center. J R Nuttall, Manchester, England—p 98
- Standardized Radium Tube—Related Dosage Problems. Preliminary Note. J Murdoch, Brussels Belgium, R Coliez Paris, France, and E Struel Brussels, Belgium—p 110
- Some Studies on the Dielectric Strength of Insulating Fluids. E E Charlton and T S Cooper, Schenectady, N Y—p 114

End Results in Radiation Therapy of Cancer of Cervix.—Stevens and Payne present statistics on 293 cases of carcinoma of the cervix, 223 of which were treated by radiation therapy prior to 1933. In the 223 cases there were nine of

carcinoma of the cervical stump after supracervical amputation for fibroid tumor. Five of these were proved by biopsy to be squamous cell carcinomas. All patients as they came were accepted for treatment. In about 75 per cent the cancers were far advanced. Of the 223 cases, 137 were proved by biopsy and 20.4 per cent of these were cured for five years or more. Of the 177 traced cases comprising both those histologically proved and those only clinically diagnosed, the number of five year cures is identical with that of the cases proved by biopsy. The cancers of eleven patients were cauterized by the Percy soldering iron or by electrocautery previous to irradiation. They did not live through the five year period. Panhysterectomies on fourteen patients with early operable cancers were performed at varying intervals before radiation treatment. Three of these, microscopically proved, lived beyond the five year period, two for nine years and one for sixteen years. Two patients with squamous cell carcinoma, each 28 years of age, who had radiation treatment alone survived the five year period, one for seven years. Twenty-three patients whose cancers were proved by biopsy recently traced are alive, well and clinically cured after from five to sixteen years. Of the total number of cases in this survey, 52.4 per cent had roentgen and radium therapy, 42.2 per cent had roentgen therapy without radium and 4.4 per cent had radium without roentgen therapy. None of the ten patients treated with radium alone survived the five year period. Nearly all the cases in this series should, the authors say, be classed as stage 3, and efficient roentgen irradiation throughout the entire pelvis should have been administered in all of them. Radium irradiation was inadequate.

American Journal of Surgery, New York

43:199 656 (Feb) 1939 Partial Index

- Practical Uses of the Tubed Pedicle Flap. H Gillies, London, England—p 201
- New Method of Tube Pedicle Skin Grafting. M Maltz, New York—p 216
- Reconstructions About the Nasal Tip. C L Struth, Detroit—p 223
- Repair of Postoperative Defects of Lips. G B New and J B Erich, Rochester, Minn—p 237
- The Traumatic Shoulder, with Special Reference to Rupture of the Supraspinatus Tendon. H V Spaulding, New York—p 298
- Elbow Injuries of Childhood Resulting from Median Epicondylar Separations. J Dunlop, Pasadena, Calif—p 310
- *Treatment and Results of 870 Severed Tendons and Fifty Seven Severed Nerves of the Hand and Forearm (in 362 Patients). M C O'Shea, New York—p 346
- Shelf Operation for Congenital Dislocation of Hip. E L Compere, Chicago—p 404
- Reconstruction of Top of Femur (Lever) or Its Elongation in Paralytic Conditions. F H Albee, New York—p 416
- Treatment of Ulcer of Leg. B Douglas, Nashville, Tenn—p 429
- Cruciate Ligaments. Resume of Operative Attacks and Results Obtained. W R Cubbins, J J Callahan and C S Scuderi, Chicago—p 481
- Restoration of Motion in Fibrous Ankylosis of the Knee with Description of a New Apparatus. R L Preston, New York—p 519
- Operation for Cure of Achillesburitis. I Zidek, New York—p 542
- Amputations and Prostheses. H H Kessler, Newark, N J—p 560
- Surgical Fusion of Unstable Joints Due to Neuropathic Disturbance. M Cleveland, New York—p 580
- Biochemical Investigation of Arthritis. Preliminary Report on Uric Acid, Glutathione and Sulfur in Blood and Sulfur in the Urine. T F Wheelton, Richmond, Va, and L H Bosher Jr, Boston—p 598
- Significance of Cystine Content of Fingernails in Arthritis. M A Sullivan, Washington, D C—p 620

Treatment of Severed Tendons and Nerves of Lower Arm.—O'Shea presents the data on the 870 severed tendons and fifty-seven severed nerves of the hand, wrist and forearm that were treated by the surgeons of St Vincent's Hospital during the last fifteen years. He states in conclusion that primary repair of tendons should be performed whenever possible. The interval between injury and operation should be short. The simple mattress stitch (black silk) will approximate the tendon ends and destroy fewer lymph channels. Only the long flexor tendon—the profundus—should be repaired. Repaired wounds should never be drained. If drainage is necessary, primary repair should not be performed. Infection occurred in 40 per cent of drained wounds. Infection occurred almost twice as frequently at the wrist as on any surface of any digit. It occurred in 15 per cent of all operations but in less than 3 per cent of 101 wounds that were not drained but repaired with black silk sutures, as compared to 18 per cent of 130 nondrained wounds repaired with chromic catgut. "Full thickness" skin

grafting should be performed as soon as possible when the skin over tendons or nerves is evulsed. The use of black silk permits early motion because of its increased tensile strength and fewer edematous reactions. A patient should be hospitalized for at least two weeks and in bed for the first week giving maximal rest to the hand. The hand should be elevated for several days. The "end results" of tendon repair were impaired and retarded by fractures (ninety-five) and severed nerves which necessitated prolonged immobilization in splints. The end result is greatly dependent on the surgeon's personal management during the first three or four weeks of postoperative care. A follow-up of 40 per cent of the repaired tendon cases shows satisfactory functional results in 80.5 per cent of the cases. All extensor tendons showed 94 per cent satisfactory results, the flexor tendons of the wrist 81 per cent and the digital flexor tendons only 65 per cent. A partially severed nerve should be repaired in order to prevent the formation of scar tissue, which hinders regeneration of the nerve fibers. A follow-up of 40 per cent of the repaired severed nerves showed satisfactory functional results in 77 per cent of the cases. Satisfactory regeneration was obtained in 70 per cent of the ulnar, 78 per cent of the median and 100 per cent of the superficial branch of the radial nerve injuries. Motor function is difficult of restoration in lacerations of the ulnar nerve above the wrist. No deaths occurred in any of the 311 operative cases of tendon or nerve injuries.

American Review of Tuberculosis, New York

39:145-274 (Feb.) 1939

- Late Results of Thoracoplasty: Evaluation of Results from Fourteen American Clinics in 1,636 Cases. F. S. Dolley, J. C. Jones, Los Angeles, and J. R. Paxton, Olive View, Calif.—p. 145.
- Intrapleural Pneumolysis by the Closed Method: Impressions After Fifteen Years' Experience with 350 Cases. R. C. Matson, Portland, Ore.—p. 162.
- Asynchrony of the Movement of the Lower Ribs Following Paralysis of the Hemidiaphragm: Test for Diaphragmatic Paralysis After Operations on the Phrenic Nerve. J. R. Head, Chicago.—p. 169.
- Chlorine for the Induction of Artificial Pneumothorax: Preliminary Report. K. S. Ray, N. N. Sen and H. N. Das Gupta, Calcutta, India.—p. 172.
- Precordial Friction Rub in Spontaneous Pneumothorax. M. R. Louria, Brooklyn.—p. 176.
- *Protamine Insulin and Collapse Therapy in Diabetes Complicated by Pulmonary Tuberculosis. B. J. Elwood, Secaucus, N. J.—p. 181.
- Noncavitating Tuberculosis: Case Reports. R. Horton, N. S. Lincoln and M. Pinner, New York.—p. 186.
- Sectional Roentgenography of the Chest. C. J. Zintheo Jr., Richmond Highlands, Wash.—p. 204.
- *Extrapulmonary Complications of Pulmonary Tuberculosis: Analysis of 1,116 Autopsies. D. Perla and S. B. Biller, New York.—p. 215.
- Proteinase and Peptidase Activity of Polymorphonuclear Leukocytes, Monocytes and Epithelioid Cells of Inflammatory Exudates. C. Weiss, San Francisco.—p. 228.
- Primary Infection in Adults: Its Clinical and Epidemiologic Aspects. J. A. Myers, P. T. Y. Ch'iu and T. L. Streukens Jr., Minneapolis.—p. 232.
- Pathology of Primary Tuberculous Infection in the Adult. H. C. Sweeney, Chicago.—p. 236.
- Case Finding: Evaluation of Various Techniques. R. E. Plunkett, Albany, N. Y.—p. 256.
- Coccidioides Infection: Case of Primary Infection in the Lung with Cavity Formation and Healing. O. J. Farness and C. W. Mills, Tucson, Ariz.—p. 266.

Insulin and Collapse Therapy in Diabetes Complicated by Tuberculosis.—Elwood gives the results of collapse therapy for pulmonary tuberculosis and the use of the newer insulins for the control of concomitant diabetes in twenty-one cases. Despite the limitations imposed on the successful continuance of artificial pneumothorax, the employment of this type of therapy restored more than three times as many to health as did elected or enforced rest. The percentage of effective pneumothorax obtained parallels the results observed in nondiabetic persons. Protamine zinc insulin utilized in all stages of both diseases was as applicable as insulin. It revealed limited advantages over insulin in the progressive phases of tuberculosis, greater adaptability and better management in tuberculosis therapeutically controlled or regressing. It is of greatest use in diabetes and arrested pulmonary tuberculosis and its advantages in these cases over insulin are comparable to those noted in otherwise uncomplicated diabetes. In terminal pulmonary disease it has little or no advantage over insulin in the control of the diabetic derangement.

Extrapulmonary Tuberculous Complications.—In an analysis of 1,116 postmortem examinations of patients dying of pulmonary tuberculosis, Perla and Biller found that laryngeal involvement occurred in about one third of the cases. Tuberculous enteritis complicated pulmonary tuberculosis in more than half of the cases. In cases of tuberculosis of the larynx, tuberculosis of the intestine generally develops. The epididymis was practically never involved without the presence of a tuberculous focus in the prostate. Tuberculosis of the genital tract is a ready source for further hematogenous dissemination. Gross renal tuberculosis was absent in more than 90 per cent of the 1,116 cases. In general, involvement of the larynx and intestine occurs in active progressive diseases of the lungs, but renal and genital tuberculosis are associated with fibrotic pulmonary lesions or hematogenous pulmonary tuberculosis. Amyloid disease is particularly prone to develop in tuberculous patients with extensive extrapulmonary complications.

Archives of Dermatology and Syphilology, Chicago

39:195-386 (Feb.) 1939

- Studies of Sex Hormones in Aene: I. Preliminary Report on Urinary Excretion of Estrogen. U. J. Wile, B. F. Barney and J. T. Bradbury, Ann Arbor, Mich.—p. 195.
- Id.: II. Urinary Excretion of Androgenic and Estrogenic Substances. U. J. Wile, J. S. Snow and J. T. Bradbury, Ann Arbor, Mich.—p. 200.
- Lymphogranuloma Venereum: Serum Lipids and Proteins. J. Rosen, H. Rosenfeld, D. Bloom and Frances Krasnow, New York.—p. 211.
- *Toxic Manifestations in the Skin Following Sulfanilamide Therapy. J. W. Tedder, New Orleans.—p. 217.
- Tumor-like Keratoses: Report of Case. D. O. Poth, San Antonio, Texas.—p. 228.
- Xanthelasma and Leprosy. R. Hopkins, S. H. Black and H. Ross, New Orleans.—p. 239.
- Cutaneous Reaction, with Reference to the Surface pH, the Reaction to Ointments and Solutions of Different pH and the Effect of the Skin in Modifying the pH of Applied Solutions. D. M. Pillsbury and B. Shaffer, Philadelphia.—p. 253.
- Cholesterol Balance and Low Fat Diet in Psoriasis. J. F. Madden, St. Paul.—p. 268.
- *Jaundice Occurring During Treatment of Syphilis. C. G. Lane, Boston.—p. 278.
- Quantitative Investigation of Porphyrin Metabolism in Diseases of the Skin. L. A. Brunsting, J. T. Brugsch and P. A. O'Leary, Rochester, Minn.—p. 294.
- Neurosypphilis in the Negro. S. Goldblatt, with collaboration of Eleanor Vandoren, Cincinnati.—p. 308.
- Circumcision in Treatment of Chancroidal Lesions of Male Genitalia: Further Observations. J. E. Rauschkolb, Cleveland.—p. 319.
- Uveoparotitis: Sarcoid Reaction. H. E. Michelson, Minneapolis, with collaboration of F. T. Becker, Duluth, Minn.—p. 329.
- Local Arterial Embolism Following an Intramuscular Injection. A. G. Franks, New York.—p. 345.

Dermatitis After Sulfanilamide Therapy.—During the last fifteen months Tedder encountered fourteen cases of sulfanilamide dermatitis. Six patients were cooperative enough to permit thorough study. The individual cutaneous lesions due to sulfanilamide were of three general types: (1) the maculopapular or morbilliform eruptions of rather limited distribution, precipitated or aggravated by exposure to sunlight, (2) widely distributed lesions ranging from macules and papules to edema and urticaria-like wheal formations, with occasional coalescence of the individual lesions, and (3) purpuric eruptions. Purpuric eruptions followed prolonged medication in one case; they did not appear until the third week of treatment. The history did not definitely reveal whether dermatitis had preceded the purpura; however, examination showed many fine macular lesions associated with multiple purpuric lesions. These were chiefly on the dependent portions of the body. There was no evidence of similar lesions of the internal organs. There were several cases of a maculopapular eruption with multiple small unruptured vesicles, limited to the areas exposed to sunlight. This disappeared when the drug was stopped. Three patients agreed to resume modified sulfanilamide therapy after ten days. There was no recurrence of the eruption. The patients were advised to avoid exposure to sunlight. After five days, suberythema doses of ultraviolet radiation were given to previously uninvolved areas of two patients. The dermatitis did not recur. The same amount of ultraviolet radiation precipitated a generalized eruption in the third case. This eruption again responded to elimination of the sulfanilamide, probably indicating that the patient became sensitized to the drug.

Jaundice and Syphilis.—Lane points out that from 1929 to 1935 there have been 100 (among 3,186 new cases of syphilis) cases of jaundice at the dermatosyphilologic clinic of the Massachusetts General Hospital. Arsphenamine was injected 51,241 times at the hospital, showing that jaundice occurred in 3.2 per cent of the cases of syphilis and after 0.2 per cent of the injections. Eleven of the cases of the disease were of congenital origin, nine primary, twenty-five secondary and fifty-five late. The central nervous system was involved in fourteen cases. In only eleven cases was jaundice present longer than eight weeks. In three cases jaundice occurred twice during treatment and in four it lasted for fifteen or sixteen weeks. The latter group comprised cases of late disease treated with a bismuth preparation interrupted by the jaundice. In none were more than ten injections of neoarsphenamine and twenty-two of the bismuth preparation given. The large number of cases of jaundice in which comparatively few injections of arsphenamine are given, as well as the large number of cases of syphilis in which much more arsphenamine produces no jaundice, would argue against arsphenamine as the main factor. It does not seem probable that arsphenamine is the only cause or even the chief cause. The occurrence of jaundice in so many cases of the present series in which bismuth compounds were used brings up the question of bismuth as a partial cause. If the bismuth is activated by liver extract and some slight damage is done by arsphenamine or by syphilis or by both, the bismuth may be the precipitating factor in breaking down certain of the hepatic functions and producing jaundice. The effect of multiple factors is difficult to estimate, but it seems clear that more than one causal agent is at work. Neither arsenic nor syphilis can account for the jaundice in all cases or even in a large majority. In general, in the treatment of this form of jaundice the administration of saline laxatives, forcing of liquids, bed rest and a high carbohydrate and low fat diet have been prescribed. Intravenous use of calcium preparations may be of help. With regard to the continuation of antisyphilitic treatment, it is the author's opinion that in the early stages of syphilis or in the presence of active syphilitic lesions the use of arsphenamine, perhaps in slightly reduced doses, of a bismuth preparation and perhaps of potassium iodide is justified. The clinical picture in the individual case must be the guide. In late and inactive congenital disease active treatment should be omitted until the jaundice has disappeared for several weeks and then resumed, perhaps with a bismuth compound at first. In the cases in which jaundice appears some time after treatment has been stopped, hepatorecurrence should be suspected and the patient given a bismuth compound or mercury and iodide rather than arsenic at this time.

Archives of Pathology, Chicago

27: 201-398 (Feb.) 1939

- Pathologic Aspects of Posterior Protrusions of the Intervertebral Disks. W. G. Deucher and J. G. Love, Rochester, Minn.—p. 201.
Phagocytosis of Trypan Blue in Rats of Different Age Groups. J. T. Culbertson, New York.—p. 212.
Endamoeba Histolytica: Experimental Infection of Stomachs of Dogs and Cats. Y. Joranson and J. Simons, Chicago.—p. 218.
Intestinal Lesions in Congenital Syphilis: Histologic Study, with Report of Three Additional Cases, in All of Which Spirochetes Were Identified. R. D'Aunoy and B. Pearson, New Orleans.—p. 239.
*Pathologic Changes in Nervous System in Yellow Fever. L. D. Stevenson, New York.—p. 249.
Primary Systemic Amyloidosis: Involvement of Cardiac Valves, Joints and Bones, with Pathologic Fracture of the Femur. S. Koletsky and R. M. Stecher, Cleveland.—p. 267.
Sensitization, Antibody Formation and Lesions Produced by Tubercle Bacilli in the Albino Rat. E. Hehre and J. Freund, New York.—p. 289.
Histology of Cutaneous Reaction to Brucella Melitensis Antigen. I. Gersh and W. C. Black, Denver.—p. 307.
Elastic Tissue. G. M. Hass, Boston.—p. 334.

Changes in Nervous System in Yellow Fever.—In a study of pieces of cerebral tissue from fourteen persons who died of yellow fever, Stevenson observed marked perivascular hemorrhage in various parts of the brain. He studied the whole brain in twenty cases of yellow fever. The chief lesion found in all the brains was perivascular hemorrhage. These hemorrhages were most frequent in the subthalamic and periventricular region at the level of the mamillary bodies. The temporal pole was the next most frequently involved area and the cerebellum only slightly less so. Perivascular lymphocytic

exudate was present in nine cases and with the exception of a single case this was slight. Changes in the nerve cells were insignificant and no inclusion bodies were seen. Reactive changes in the microglia and astrocytes were slight. It is concluded that there is no definite evidence of neurotropism on the part of the virus of yellow fever.

Bulletin New York Academy of Medicine, New York

15: 61-128 (Feb.) 1939

- Significance of Albumin Fraction of Serum. A. A. Weech, New York.—p. 63.
General Pathology of Lymphosarcoma. J. Ewing, New York.—p. 92.
Present Status of Serum Therapy in Pneumonia. R. L. Cecil, New York.—p. 104.
*Treatment of Pneumonia with Antipneumococcus Rabbit Serum. C. M. MacLeod, New York.—p. 116.

Antipneumococcus Rabbit Serum for Pneumonia.—The intravenous injection of a small amount of rabbit serum in the treatment of pneumonia, MacLeod states, is not to be recommended without first knowing the results of intradermal and intraconjunctival tests, since anaphylactic shock may occasionally occur in extremely hypersensitive individuals following the intravenous injection of as little as 0.1 cc. of well diluted serum. As a further precaution after the results of the tests are known, it has been the author's practice slowly to inject intravenously 0.1 cc. of the therapeutic serum diluted in 5 cc. of physiologic solution of sodium chloride. If a fall in blood pressure and an elevation of the pulse rate do not occur, it is considered safe to proceed with the therapeutic dose of serum. The reactions which may occur correspond to those following the use of horse serum. A total of 100 patients with conditions including infections due to pneumococci of nine different types have been treated. Eleven patients have died. Of the eleven who died, seven suffered from type III pneumonia. The final judgment on the efficacy of type III antipneumococcus rabbit serum has not been made, but in a certain group of patients a beneficial effect has occurred, particularly in persons before the sixth decade. In such patients a dramatic response may occur, similar to that which is seen so frequently in the serum treatment of type I pneumonia. Of the patients with type III pneumonia who died, only three could be considered as having received an adequate dosage of serum; but the fact that these patients died despite intensive treatment makes it imperative to pursue further the investigation of the therapy of type III infections. If the twenty-six cases of type III pneumonia are excluded from the series, the mortality rate is only 5.4 per cent. The patients who died, other than those in the type III group, illustrate the advantage of early treatment with antipneumococcus serum. All but one of these patients were treated late in the disease; in two, empyema was present associated with severe bacteremia; one patient had meningitis at the time of admission, and the fourth patient was an elderly man with type II pneumonia, who had consolidation of four pulmonary lobes when admitted to the hospital. Defervescence in twenty-five cases of type I pneumonia, treated with concentrated horse serum by the divided dose method, occurred in an average of 22.6 hours from the beginning of treatment. In twenty-six cases treated with unconcentrated rabbit serum, defervescence occurred in an average of 13.8 hours. However, in sixteen of these twenty-six cases the full therapeutic amount of serum was administered in less than two hours, and in this group defervescence occurred on the average in 9.3 hours. The same method of intensive therapy has been applied to the treatment of forty-eight cases of pneumonia due to other types as well. In many instances the full therapeutic dose of serum was given at one injection shortly after the patient was admitted to the hospital. In the remainder, treatment was completed within eight hours. The average time required for defervescence was only 9.75 hours. In practically all these cases the intradermal test with the specific polysaccharide was employed to determine when sufficient serum had been given. The author thinks that in the adult patient with uncomplicated type I pneumonia of not more than three days' duration a dose of 125,000 units should be given as soon as possible. After the third day a somewhat larger initial dose should be given, particularly if the consolidation involves more than one pulmonary lobe or if complications such as bacteremia are known to be present.

Canadian Medical Association Journal, Montreal

40: 105-212 (Feb.) 1939

- Influence of a Specific Hormone of the Pituitary on Basal Metabolism in Man. I. M. Rabinowitch, Marjorie Mountford, D. K. O'Donovan and J. B. Collip, Montreal.—p. 105.
- Streptococcal Throat Infections: Epidemiology. A. L. McLean, Halifax, N. S.—p. 108.
- Clinical Aspects, Complications and Treatment of Streptococcal Sore Throat. P. B. Macfarlane, Hamilton, Ont.—p. 109.
- Bacteriologic Aspect of Streptococcal Sore Throat. W. J. Deadman, Hamilton, Ont.—p. 113.
- Human Sterility. W. P. Tew, London, Ont.—p. 116.
- Empyema. W. G. Carscadden, Toronto.—p. 120.
- Lipiodobronchography. J. Gosselin and J. E. Perron, Quebec City, Que.—p. 123.
- Studies on Solubility of Quartz and Silicates. C. C. Lucas and Margery E. Dolan, Toronto.—p. 126.
- *Incidence of Anemia in Women of the Low Income Class. W. R. Kennedy, Montreal.—p. 134.
- Study of 500 Consecutive Cases of Preeclampsia. F. C. Irving, Boston.—p. 137.
- *Rheumatic Infection in Childhood: Effect of Surgical Operations on Blood Sedimentation Rate. H. L. Bacal and R. R. Struthers, Montreal.—p. 140.
- Comparison of Ether, Spinal and Cyclopropane Anesthesia. J. C. Houston, Charlottetown, Prince Edward Island.—p. 143.
- Otitis Media from the Pediatrician's Point of View. G. A. Campbell, Ottawa, Ont.—p. 146.
- Use of Urea and Caroid in Chronic Otitis Media. G. E. Tremble, Montreal.—p. 149.
- Treatment and Later Management of Coronary Thrombosis. R. M. Lymburner, Hamilton, Ont.—p. 153.
- Diverticulitis of the Sigmoid Colon. J. H. Geddes, London, Ont.—p. 157.
- The Surgeon's Responsibility in Ontario Accident Compensation Cases. C. H. Hair, Toronto.—p. 160.

Anemia in Women with Low Incomes.—Kennedy states that 1,451 parous women of the child-bearing age, representing the poorer classes of the Montreal population, have been examined at the Child Welfare Association with special reference to the incidence of anemia. On no occasion did any of these volunteer women present themselves because of any symptoms of ill health. They were members of families in which the wage earners were unemployed or the monthly incomes were less than \$100. Of the 1,451 cases 824 showed normal hemoglobin levels and 627 various degrees of anemia with hemoglobin levels less than 80 per cent. There were 377 persons with hemoglobin levels of 74 per cent or less. Moderate anemia (hemoglobin from 60 to 69 per cent) was present in 124 cases and severe anemia (less than 60 per cent) in sixty-four cases. The anemia was of the hypochromic type in all instances excepting twenty-one, in which the anemia was of the hyperchromic form. One hundred and nineteen women were seen during early pregnancy and sixty-seven of these had hemoglobin levels of less than 75 per cent. However, the majority of these women were retested one year after the termination of the pregnancy and the same degree of anemia existed. The study of 1,000 records in this series showed there was no conclusive evidence of any definite correlation between the presence of anemia and the number of pregnancies. There was also an absence of any significant correlation between the incidence of anemia and the history of hemorrhage, profuse menstruation or the interval between pregnancies. The approximate protein diet in fifty cases in which hemoglobin levels were between 75 and 100 per cent was compared with fifty cases in which hemoglobin levels were between 25 and 65 per cent. It was found that less protein in the form of beef, pork, liver, chicken and eggs was consumed by the anemic women. Approximately the same amounts of fish and milk were used by the two groups. Under ideal circumstances women require for health up to the age of the menopause about four times as much iron as men. Routine hemoglobin estimation in private and group health examinations will reveal many instances of adults supposedly in good health but actually suffering from varying degrees of idiopathic hypochromic anemia.

Rheumatic Infection in Childhood.—Bacal and Struthers compared the effect of surgical operations to eradicate foci of infection on the blood sedimentation rate of children suffering from rheumatic fever and normal children presenting themselves to the outpatient department for tonsillectomy. In none of the control children was a history of rheumatic fever elicited; likewise none of them gave a family history of rheumatic infection. The sedimentation rates were made immediately before opera-

tion, two days after operation, at the end of one week and at the end of two weeks. There were apparently three types of response in the normal children: 1. Some showed no alteration in sedimentation rate or loss of weight after operation. 2. Some showed a sharp rise and sudden fall of the sedimentation rate after operation, with an average loss of 2 pounds (1 Kg.). 3. The sedimentation rate fell to normal within the week following operation in a few children in whom it was elevated before tonsillectomy and continued at a normal rate for the period of observation. The children suffering from rheumatic fever or its manifestations showed reactions comparable on the whole to those of normal children. 1. The sedimentation rates were not affected by operation in some children with acute rheumatic fever who had no evidence of activity as shown by a normal sedimentation rate. 2. Some children who had no evidence of activity as shown by the sedimentation rate showed a sharp rise after operation. This rise in the sedimentation rate apparently may follow any surgical procedure, tonsillectomy, removal of carious teeth or surgical drainage of the paranasal sinuses. 3. In some children in whom the elevated sedimentation rate was the only evidence of activity, the authors concluded after prolonged observation that the elevated rate was probably due to foci of infection rather than to rheumatic fever. These children showed a sudden and sharp drop to normal and the sedimentation rate remained within normal levels during the period of observation. Weight loss in rheumatic children following surgical intervention is greater than in normal children. The surgical removal of foci of infection in a child with rheumatic disease is a definitely more serious undertaking than in the nonrheumatic child.

Endocrinology, Los Angeles

24: 137-296 (Feb.) 1939

- Maintenance of the Corpus Luteum and Inhibition of Parturition in the Rabbit by Injection of Estrogenic Hormone. G. P. Heckel and W. M. Allen, Rochester, N. Y.—p. 137.
- Induction of Mating in the Dog with Pregnancy Urine Extract. J. H. Lenthem and J. A. Morrell, Princeton and New Brunswick, N. J.—p. 149.
- Biologic Assay of the Mammogenic Duct Growth Factor of the Anterior Pituitary. A. A. Lewis, C. W. Turner and E. T. Gomez, with technical assistance of W. T. Carroll, Columbia, Mo.—p. 157.
- Copulatory Activity in Adult Male Rats Following Castration and Injections of Testosterone Propionate. C. P. Stone, Stanford University, Calif.—p. 165.
- Effect of Prolonged Testosterone Propionate Administration on the Immature and Adult Female Rat. M. Mazer and C. Mazer, Philadelphia.—p. 175.
- Human Serum Response to Gonadotropic Hormone (Pregnancy Urine Extract). W. Saphir, Katharine M. Howell and R. H. Kunstadter, Chicago.—p. 182.
- Further Studies of Male Sex-Stimulating, Female Sex-Repressive Fractions of the Adrenal Glands of Cows, Steers and Bulls. F. M. Potter Jr. and D. G. Simonsen, Monrovia, Calif.—p. 187.
- Comparison of the Resistance of Male and Female Rats to Cortin. D. J. Ingle, Rochester, Minn.—p. 194.
- Refractory State Produced by Adrenal Extract. F. A. Hartman, Lena A. Lewis and K. P. McConnell, Columbus, Ohio.—p. 197.
- *Relationship of Hematopoietic Phenomena to Endocrine Disorders in Women. E. A. Sharp and H. C. Mack, Detroit.—p. 202.
- New and Improved Method for Preparation of Pineal Extract. A. Steinberg, Philadelphia.—p. 219.
- Experimental Phases of the Pineal Problem. N. H. Einhorn and L. G. Rowntree, Philadelphia.—p. 221.
- Surgical Treatment of Experimental Insulin Poisoning. F. M. Allen and C. A. Vicens, New York.—p. 230.
- Diabetes of Bearded Women (Suprarenal Tumor, Diabetes and Hirsutism): Clinical Correlation of the Function of the Suprarenal Cortex in Carbohydrate Metabolism. H. C. Shepardson and E. Shapiro, San Francisco.—p. 237.
- Effect of Salts on Diabetes Insipidus Following Posthypophysectomy in the Rat. H. G. Swann and B. J. Penner, Chicago.—p. 253.
- *Build in Relation to Menstrual Disorders and Obesity. Leona M. Bayer, San Francisco.—p. 260.

The Blood and Endocrine Disorders in Women.—During the last several years approximately 450 anemic women have been observed. An analysis of this group by Sharp and Mack revealed that 110 patients, or 25 per cent, had concomitant anemia and endocrine disorders. Complete diagnostic and therapeutic observations were obtained from sixty-eight of these women. A similarity in the symptomatology of the entire group of 110 patients permits classification into three groups: (1) from the menarche to 24 years, primary pituitary-thyroid deficiency, (2) from 25 to 39 years, secondary thyro-ovarian failure,

and (3) from 40 years to the menopause, perimenopausal stage. Twenty-four patients were between the ages of 13 and 24 years. Six of the twenty-four had moderate erythrocytopenia on admission, while the remaining eighteen had severe anemia. Purpura was elicited in about half of this group. In the other two groups the average erythrocyte and hemoglobin levels were appreciably lower on admission than were the average levels for group 1. Group 2 resembled group one in that the predominant blood pattern in both was normochromic and normocytic in contrast to the predominance of microcytosis and hypochromemia in the older patients in group 3. Collectively, the average blood and hemoglobin levels showed a greater depletion in the two older groups. The authors believe that there is a definite anemia-endocrine syndrome in women. Definite signs of hypothyroidism, pituitary failure and hypogonadism are common to the syndrome. The anemia is usually normocytic in the adolescent and early adult age groups. Microcytosis and hypochromia appear to be expressions of chronicity of the anemic state, since they occur with greater frequency in middle-aged patients. Achlorhydria was frequent in all three groups, as were low basal metabolic rates, purpura, uterine bleeding, gastrointestinal disturbances and psychoneuroses. The authors believe that simultaneous treatment of the hematopoietic and endocrine disturbances by appropriate medicaments insures a favorable prognosis in a majority of cases. Gonadotropic substance in doses of from 200 to 1,000 rat units should be given daily until the uterine bleeding of immaturity is controlled. Thyroid extract to tolerance when indicated and iron salts are essential elements of the therapeutic plan for all three groups, when signs and symptoms indicate an appreciable degree of thyroid deficiency and mineral imbalance. The bleeding of maturity as well as the amenorrheic state encountered at any age is an indication for theelin in conjunction with gonadotropic substance. Curettement may be indicated at the outset and particularly when endometrial polypoid is present. Bed rest is desirable for patients having the severe periodic or continuous types of bleeding, but the majority of patients can be treated successfully without bed rest.

Build, Menstrual Disorders and Obesity.—In searching for the relationships between configuration and disease Bayer has made, since 1930, anthropometric and clinical studies of 110 women and girls whose complaints were thought possibly to be associated with their build. Those with obesity or menstrual disorders or both have been omitted and ninety cases are finally considered. The dominating symptom was menstrual disorder in forty-six, obesity in thirty-six, thyroid disorder in six and ectodermal dystrophy in two. In an attempt to sort patients into groups according to build, various measurements, indexes and dividing limits were tried until criteria were set up in which the photographs, the anthropometric measurements and the clinical diagnoses were in reasonable agreement. Eventually four groups were defined: feminine, hypofeminine, hyperfeminine and virile. The clinical testimony tends to corroborate the classification both in its lines of demarcation and in its developmental thesis. It has been possible to define each group not only as to build but also as to typical anatomic and physiologic corollaries. 1. In the normal feminine women the build is distinguished by normal body hair and breast development and average proportions, especially with regard to sitting height-stature and trunk-breadth indexes. Clinically these patients are usually normal except that there may be menstrual disturbances of flow and rhythm. 2. The build of the hypofeminine women is distinguished by scanty body hair, small breasts, long legs and a narrow pelvis. Underweight, primary amenorrhea, incomplete genital development, delayed bone age and increased sugar tolerance constitute the associated syndrome. 3. The hyperfeminine subject is distinguished by increased body hair, large breasts, short legs and a broad pelvis. Overweight, advanced bone age and decreased sugar tolerance constitute the clinical syndrome. Menstrual disturbances consist in irregularities of rhythm and flow. 4. The build of the virile type of woman presents excessive body hair, small breasts, short legs, broad shoulders and a narrow pelvis. Overweight, muscularity, secondary amenorrhea and masculinization of the genitals constitute the extreme clinical syndrome.

Johns Hopkins Hospital Bulletin, Baltimore

64: 83-154 (Feb.) 1939

Occurrence and Significance of Myocardial Failure in Acute Hemorrhagic Nephritis. M. R. Whitehill, W. T. Longcope and R. Williams, Baltimore.—p. 83.

Significance of Fibrillation, Fasciculation and Other Muscular Twitchings, with Special Reference to Recent Physiologic Investigations. F. R. Ford, Baltimore.—p. 114.

*Does Ether Narcosis Protect from Anaphylactic Shock? A. R. Koontz and R. T. Shackelford, Baltimore.—p. 125.

Preliminary Report on an Operation for the Cure of Meralgia Paraesthetica. F. C. Lee, Baltimore.—p. 147.

Ether Narcosis as Protection from Anaphylactic Shock.—Koontz and Shackelford gave shock-provoking doses of foreign protein to sixty-nine unanesthetized guinea pigs sensitive to it. Thirty-six of them lived and thirty-three died. Sixty-five guinea pigs sensitive to foreign protein were given shock-provoking doses while under ether anesthesia; fifty of these lived and fifteen died. Of the fifteen that died, one had pneumonia when it received the injections and another a completely atelectatic lung, shown at necropsy. A third died because the anesthesia was forced too far. A fourth death was probably due to the anesthesia. Two animals had pneumonia and atelectasis, respectively, when the protein was injected; these conditions were undoubtedly important contributing factors in their deaths. If these two animals and the one in which the anesthetic definitely caused the death are eliminated, there would be only twelve guinea pigs that died when injected during anesthesia. This would reduce the deaths to 18.5 per cent under anesthesia, as opposed to 47.8 per cent without anesthesia. In none of the animals dying without anesthesia was any underlying pathologic condition of the lungs revealed at necropsy: All of the unanesthetized group that survived showed marked symptoms of anaphylaxis. This was not the case in any of the anesthetized group. Of course, the anesthetic may have masked some of the clinical signs of anaphylaxis. The authors believe that there is a mechanical factor which produces effects entirely aside from the effects of the injected serum. If they are correct, they think that the percentage of deaths in the animals injected while under anesthesia would be further reduced. If these results are to be applied to man, the percentage of deaths is too high to indicate that it is safe to inject foreign serums into human beings under the assumption that anesthesia will afford complete protection against anaphylaxis. However, guinea pigs are more susceptible to anaphylactic shock; hence it is possible that any relative protection afforded by anesthesia may be more effective in man.

Journal of Allergy, St. Louis

10: 105-208 (Jan.) 1939

Food Allergens: II. Atopic Reagents and the Botanic Classification of Foods. O. R. Withers, Kansas City, Mo.—p. 105.

Chemistry of Allergens: I. Isolation of an Active Fraction from Cottonseed. J. R. Spies, H. S. Bernton and H. Stevens, Washington, D. C.—p. 115.

Further Studies on the Allergic Activity of Protein and Nonprotein Nitrogen Fractions of Ragweed Pollen Extract. A. Stull and W. B. Sherman, New York.—p. 130.

*Roentgen Treatment of Asthma. C. K. Maytum and E. T. Leddy, Rochester, Minn.—p. 135.

Some Observations on the Blood Eosinophil Count in Asthmatics. H. H. Hunt, Birmingham, England.—p. 146.

Oral Administration of Ragweed Pollen. J. H. Black, Dallas, Texas.—p. 156.

Skin Reactions: V. Contour Gage for Measurement of Height and Breadth of Allergic Wheals. H. A. Abramson and M. H. Gorin, New York.—p. 159.

Asthma and Allergic Rhinitis Due to Sensitization to Phthalic Anhydride: Report of Case. R. A. Kern, Philadelphia.—p. 164.

Sulfur Dioxide Poisoning as a Cause of Asthma. A. Romanoff, New York.—p. 166.

Roentgen Treatment of Asthma.—Maytum and Leddy used roentgen rays in the treatment of 215 cases of asthma. These patients represent about 6 per cent of the total with asthma who were treated at the clinic during 1935 and 1936. Twenty of the 215 cases are not included in the present report because treatment was incomplete or the diagnosis of asthma was questionable and another thirty-four cases are not reported because the patients were not followed closely enough. Of the remaining 161 patients, thirty-eight obtained more than 75 per cent relief, which lasted from one month to many months. Twenty-three patients obtained as much relief but are not

included, since other treatment given at about the same time may have been a factor in relieving the symptoms. Twenty-six patients had from 50 to 75 per cent relief for periods of one month or longer. The remaining seventy-four patients experienced less than 50 per cent relief, or more than 50 per cent relief for only short periods of time, and the results are accordingly classed as failures. Two of the patients in this group were completely relieved of asthma but died within a month, one from coronary occlusion and the other from post-operative infection. Five patients felt that their asthma was definitely worse after treatment. Even though at present the authors favor treatment through paravertebral fields, they do not advocate this method to the exclusion of all others. The beneficial effects from roentgen therapy are only temporary, and cures of asthma are not to be expected. They believe that the results obtained justify its use in cases of severe asthma in which relief has not been obtained with other measures.

Journal Industrial Hygiene & Toxicology, Baltimore

21: 29-56 (Feb.) 1939

- *Systemic Effects Resulting from Exposure to Certain Chlorinated Hydrocarbons. L. Greenburg, May R. Mayers and Adelaide Ross Smith, New York.—p. 29.
Effect of Certain Impingement Dust Sampling Instruments on Dust Particles. E. L. Anderson, Hartford, Conn.—p. 39.
Toxicologic Studies of N-Isobutyl Amides of Aliphatic Acids. W. Deichmann-Gruebler, Wilmington, Del.—p. 48.
Report of the Use of Biophotometer and Vitamin A Therapy in Industry. O. H. Schettler, R. F. Bisbee and B. H. Goodenough, East Pittsburgh, Pa.—p. 53.

Systemic Effects of Exposure to Chlorinated Hydrocarbons.—Chlorinated naphthalenes and diphenyls are used extensively for insulating wire and in the manufacture of electrical condensers. Because of the obvious need for more clinical data with regard to the effects of exposure to chlorinated naphthalene, Greenburg and his associates report three cases in persons who, after exposure in the course of their work to these known hepatotoxic substances, died of acute yellow atrophy of the liver and in whose cases no other etiologic factors could be discovered after careful postmortem and clinical study. The plant conditions under which the patients had worked were carefully investigated. Two of the patients had suffered from at least one previous attack of hepatitis followed by a certain degree of improvement before the onset of the fatal attack. A papulopustular eruption was present in two cases. In one it antedated the systemic symptoms. This type of eruption is characteristic of the dermatitis caused by chlorinated naphthalenes and until recently was the only disturbance attributed to them. In the first case the cutaneous eruption apparently antedated all evidences of systemic disease. Had the girl been promptly removed from further exposure it is possible that her life would have been saved; or had the physicians first called on to treat the jaundice (of whatever origin) in her case or in the second case recognized the danger of continued exposure to the chlorinated naphthalenes these deaths might possibly have been averted. In order to prevent the condition the authors recommend that physicians should report all illnesses occurring among workers exposed to the chlorinated naphthalenes and diphenyls. Persons suffering from the typical acneiform eruptions should be removed from further exposure. Employees who have had any liver disease—even a mild catarrhal jaundice—should not work with these substances; neither should those with a history of typhoid, malaria, gallstones or other diseases known to affect the liver adversely. Individuals receiving arsphenamine treatment for syphilis or those susceptible persons who are taking drugs believed to be injurious to the liver should not be further exposed to potential hepatic poisons. Persons working with the chlorinated naphthalenes and diphenyls, if requiring a general anesthetic for an operation, should not be given chloroform or tribromethanol in amylene hydrate and, vice versa, individuals who have recently received such anesthetics should not go back to their former work or to work with other substances believed to be potentially toxic to the liver. Pregnant women should not be exposed because the liver, in pregnancy, appears to be peculiarly susceptible to injury. With proper attention to ventilation and medical supervision of workers the chlorinated naphthalenes and diphenyls can be used in industry with safety.

Journal of Infectious Diseases, Chicago

64: 1-96 (Jan.-Feb.) 1939

- Serologic Types of Salmonella Isolated from Paratyphoid in Chickens. E. Jungherr and C. F. Clancy, Storrs, Conn.—p. 1.
Effect of Sulfanilamide on Pneumococcal Infections in Mice. J. M. Rueggesser and M. Hamburger, Cincinnati.—p. 18.
Studies on Chemical Nature of Factors Producing the Shwartzman Phenomenon. D. Glick and W. Antopol, Newark, N. J.—p. 22.
Effect of Sulfanilamide Therapy on Bovine Mastitis as Indicated by Laboratory Tests. W. G. Hoge, W. V. Halvorsen and V. A. Cherrington, Moscow, Idaho.—p. 27.
*Chemotherapy in Virus Diseases. E. B. McKinley, Jean Sinclair Meek and Ellen Gray Acree, Washington, D. C.—p. 36.
Effect of Sulfanilamide on Experimental Infections with Bacterium Neorhizium in Rabbits. Elizabeth S. Hemmens and G. M. Dack, Chicago.—p. 43.
Microscopic Agglutination Test for Diagnosis of Swine Erysipelas. A. G. Karlson and S. H. McNutt, Ames, Iowa.—p. 49.
Effect of Normal and Raw Apple Diet on Flora of Duodenum, Ileum and Cecum of Monkeys. G. M. Dack, R. Johnson and L. R. Dragstedt, Chicago.—p. 52.
Action of Prontosil Soluble and Sulfanilamide on Phagocytic Activity of Leukocytes and on Dissociation of Streptococci. Ruth Tunnichoff, Chicago.—p. 59.
*Lymphocytic Choriomeningitis: Discussion of Its Diagnosis in Man. Marion E. Howard, New Haven, Conn.—p. 66.
Use of Sulfanilamide in Experimental Brucellosis. B. D. Chinn, Chicago.—p. 78.
Bacteriophage Absorption by Blood Cells and Bacteria. Martha Applebaum Congress, New York.—p. 83.
Washing of Haemophilus Pertussis Vaccines. J. A. Toomey and W. S. Takacs, Cleveland.—p. 89.
Bacteriology and Immunology of Chronic Staphylococcal Osteomyelitis. II. Effect of Inflammatory Tissue on Antigens and Antibodies. Katherine E. Ifite, Chicago.—p. 93.

Chemotherapy in Virus Diseases.—McKinley and his associates treated several experimental virus diseases (rabbit myxoma, rabbit fibroma, herpetic encephalitis, choriomeningitis and St. Louis encephalitis) with sulfanilamide, prontosil and sodium sulfanilyl sulfanilate. None of the compounds were of any therapeutic value in the diseases treated.

Lymphocytic Choriomeningitis.—Howard isolated a strain of the virus of benign lymphocytic choriomeningitis from the spinal fluid of a patient early in the course (sixth and seventh days) of the infection and when the cellular response in the spinal fluid was at its height. Abnormalities were slow in disappearing from the spinal fluid. Neutralizing antibodies in the patient's serum were demonstrated in low titer late in convalescence when mice as the test animals and the virus isolated from the patient were used. The patient's serum did not protect guinea pigs against Rivers' W. E. strain of the virus. Reinoculation experiments and the protection afforded by serum from Rivers' patient W. E. gave proof of the immunologic identity of this strain with others already described. The virus isolated lost its virulence for guinea pigs during constant passage through mice.

Journal of Pediatrics, St. Louis

14: 137-276 (Feb.) 1939

- *Neurogenic Tumors of Sympathetic Nervous System in Children: Report of Three Cases Surviving for a Year or Longer. F. H. Wright and B. H. Paige, New York.—p. 137.
Blood Pressure Determination in Children: Effect of the Width of the Cuff. R. Day, New York.—p. 148.
Consideration of Race and Sex in Relation to Growth and Development of Infants. Ethel C. Dunham, Rachel M. Jense, Washington, D. C., and A. U. Christie, San Francisco.—p. 156.
*Studies in Use of Crystalline Vitamin C (Ascorbic Acid) in Prophylaxis and Treatment of Infantile Scurvy and Some Other Disorders of Infancy and Childhood. A. S. Kenney, New Orleans, and M. Rapoport, Philadelphia.—p. 161.
Epidemic Diarrhea of the Newborn: Report of Three Outbreaks. C. J. Baker, New York.—p. 183.
Factors Influencing Relation of Convulsions and Hyperthermia. M. E. Wegman, Baltimore.—p. 190.
Hypergenitalism in Children. I. P. Bronstein, Chicago.—p. 203.
Acute Infectious Duodenitis (Infectious Jaundice): Report of Seventy-Six Cases. H. A. Slesinger and I. Zeligman, Windber, Pa.—p. 213.
Congenital Syphilis: Ten Year Study of Forty-Five Children. P. J. Howard, Detroit.—p. 220.
Mold Spore Content of Air in Boston, with Reference to Atopic Sensitivity. H. N. Pratt, Boston.—p. 234.

Neurogenic Tumors of Sympathetic System.—Wright and Paige report that three children who had neurogenic tumors of the sympathetic nervous system are alive with no evidence of recurrence or metastasis a year or more after the discovery of the tumors and their consequent removal. One patient is living

six years after removal of a sympathicoblastoma but retains her original signs and symptoms of compression of the spinal cord. One patient is well one year after the removal of a large pelvic ganglioneuroma. One patient is well one year after the discovery of a thoracic ganglioneuroma which has not been excised completely. Surgical removal of sympathicoblastomas followed by radiation therapy may occasionally be effective in preventing recurrence or metastasis.

Ascorbic Acid in Prophylaxis and Treatment of Scurvy.—Kenney and Rapoport gave nineteen infants crystalline vitamin C, 1.83 mg. per kilogram of weight daily, for five months as a prophylactic against scurvy. No clinical or x-ray evidence of scurvy was apparent during the period of observation. Crystalline vitamin C was used in the treatment of twenty-one cases of infantile scurvy and satisfactory healing was obtained. The presence and significance of fever in the scorbutic infant are analyzed, and the lack of temperature elevation following the administration of vitamin C is pointed out. There was no constant effect produced on the capillary resistance (capillary fragility test) in the scorbutic infants following the administration of vitamin C. Crystalline vitamin C seemed to stimulate wound healing in the incision of an infant operated on for pyloric stenosis in whom there was no evidence of healing prior to its administration. Intravenous administration of vitamin C seemed to have no effect on the hematuria in a case of subacute hemorrhagic nephritis.

Maine Medical Association Journal, Portland

30:21-44 (Feb.) 1939

- The Doctor, Family Friend or Public Servant. A. Craig, Bangor.—p. 21.
Gastroscopic Observations on Chronic Gastritis. C. W. McClure and I. R. Jankelson, Boston.—p. 24.
Nonprofit Hospital Service Plans as Presented to the Annual Meeting of the Maine Hospital Association, Lakewood, Maine, Aug. 31, 1938. E. H. Young, Portland.—p. 27.

Medical Bull. of Veterans' Adm., Washington, D. C.

15:217-332 (Jan.) 1939

- Arthroplasty of Hip with Use of Vitallium Cup. H. H. Hopkins and F. N. Zuck.—p. 217.
Cancer of the Rectum. P. E. Johnson.—p. 218.
Transnasal Instillation of Lipiodol into Bronchial Tree. J. R. Boswell.—p. 224.
Associated Pulmonary Tuberculosis and Diabetes Mellitus. W. R. Leverton.—p. 227.
Intestinal Tuberculosis: Report of 3,693 Cases Studied by X-Rays and at Autopsy. H. B. Williams.—p. 236.
Burbot-Liver Oil in Tuberculosis. J. E. Gaines.—p. 240.
Clinical and Roentgenologic Analysis of 150 Cases of Chronic Nonspecific Arthritis. M. L. Weber.—p. 243.
Cervicic Acid in Treatment of Duodenal and Gastric Hemorrhage. W. S. Anderson.—p. 261.
Syringobulbia. J. F. Casey.—p. 264.
Chronic Polymorphous Light Dermatitis: Report of Case. W. J. Turner.—p. 270.
Folie à Deux. M. K. Amdur and S. T. Ginsberg.—p. 277.
Aplastic Anemia. H. Kessler.—p. 280.
Intravenous Urography. W. M. Caffee.—p. 288.
Pilonidal Sinus. H. B. Cupp.—p. 291.
Bacteriologic Examination of Eating Utensils. C. L. Carlisle and A. O. Hartinger.—p. 294.

Northwest Medicine, Seattle

38:37-76 (Feb.) 1939

- *Acromioclavicular Dislocation. Conservative Method of Treatment. R. Anderson and E. Burgess, Seattle.—p. 40.
Fracture of the Jaw. A. B. Murphy, Everett, Wash.—p. 44.
Fractures of the Hip Joint: Extra-Articular Fixation with a Single Screw. G. W. Freeman, Seattle.—p. 46.
Painful Shoulders. C. E. Carlson, Portland, Ore.—p. 52.
Use of Therapeutic Iodized Oil in Treatment of Bronchial Asthma. M. W. Moore, Portland, Ore.—p. 55.
Hypoglycemia Following Delivery of a Diabetic with Edema. L. J. Palmer and G. D. Capaccio, Seattle.—p. 58.
Differential Diagnosis and Treatment of Diseases Associated with Enlargement of Spleen or Lymph Nodes. E. E. Osgood, Portland, Ore.—p. 59.

Acromioclavicular Dislocation.—Anderson and Burgess state that acromioclavicular dislocations, easily and quickly reduced in most cases, prove exceedingly difficult if not impossible to hold reduced by the unsatisfactory dressings in current use. Regardless of the degree of dislocation, a reduction can usually be effected in fresh cases by elevating the shoulder upward and forcing the outer end of the clavicle downward, thus opposing the joint surfaces. Uninterrupted maintenance in this position for a period of several weeks will allow the

ligaments to heal. The authors believe that a dependable and physiologic means whereby acromioclavicular dislocations may be reduced and held is provided by use of Anderson's suspension-hammock clavicle splint. To this splint one addition is made, a single strap over the injured shoulder. This strap attaches to the frame of the splint, front and back, and furnishes a means whereby the clavicle is firmly held down in normal position. With this method reduction cannot be lost, yet there is no undue compression on axillary or shoulder structures and the patient is permitted comparatively free use of the arm. The splint allows elevation of the shoulder by suspension along correct anatomic lines, since adjustable points of motion lie over both the sternoclavicular and shoulder joints. The hammock is molded to conform to the normal axilla and is constructed of resilient rubber, avoiding compression of the axilla. Since the weight of the shoulder is transmitted first to the sternoclavicular area and then to the base of the splint, there is no tendency for dragging or instability. The acromioclavicular strap which passes over the injured shoulder furnishes a means of counterpressure which is mechanically secure, since it is attached to the front and back of the same frame that supports the hammock. By this method patients are ambulatory and can wear their regular clothing. They are unusually comfortable with the splint in place. General anesthesia is unnecessary in reducing the dislocation and applying the splint; in fact, application is facilitated by having the patient sitting or standing. An injection of morphine will usually suffice. The splint is left continuously in place throughout healing. When only the capsular ligaments are torn and the conoid and trapezoid ligaments are intact, splinting for from two to three weeks is sufficient. In complete dislocations the fixation should remain in place for at least six weeks; frequently twelve weeks is necessary for complete healing. Care should be taken not to use the arm for lifting or any other heavy work. The strap across the injured shoulder should be kept tight. Regular x-ray inspection should be made to see that reduction is firmly maintained. Following removal of the splint, graduated active restoration of the function of the shoulder is carried out. The conservative method outlined will not be applicable in all cases. Old dislocations which have gone untreated and the occasional fresh one which is difficult to hold reduced because of the interposition of soft tissues in the joint will need an open reduction. Postoperative splint fixation for six weeks or more should be regularly carried out as supplementary support to internal fixation.

Public Health Reports, Washington, D. C.

54:149-204 (Feb. 3) 1939

- Protein Tyrosine Reaction: Biochemical Diagnostic Test for Malaria. H. O. Proske and R. B. Watson.—p. 158.
Chronic Ulcerative Cecitis in the Rat. B. F. Jones and H. L. Stewart.—p. 172.

Rocky Mountain Medical Journal, Denver

36:73-144 (Feb.) 1939

- Oral Lesions as Sources of Infection: Their Diagnosis and Treatment. W. W. Cogswell, Colorado Springs, Colo.—p. 90.
Nutshells and Kernels in the Bronchus. F. L. Stauffer, Salt Lake City.—p. 93.
Treatment of Asthma. T. D. Cunningham and J. C. Mendenhall, Denver.—p. 97.
A Layman Looks at Hospitals. P. H. Holme, Denver.—p. 100.
Choice of Anesthetic Agent. C. W. Metz, Denver.—p. 102.
*Gastrointestinal Symptoms in Anorectal Disease. H. Gauss, Denver.—p. 106.

Gastrointestinal Symptoms in Anorectal Disease.—In discussing the digestive disturbances referred by anorectal disease Gauss cites in detail a case, among fourteen others, in which the digestive syndrome suggested peptic ulcer and irritable colon but examination revealed hemorrhoids, the removal of which was followed by rapid improvement. Apparently in this case the hemorrhoids were responsible for the digestive distress. The mechanism of the production of digestive symptoms of anorectal origin is generally considered as taking place through the sympathetic and parasympathetic nervous system. It is believed that a constant irritation at the anorectal region may give rise to the irritable colon syndrome and that this may be followed by the gastric irritation syndrome. There are no digestive symptoms which are pathognomonic of anorectal origin. In thirteen cases the successful treatment of

the anorectal disease was followed by prompt relief of the digestive distress. The author did not encounter gallbladder, appendical or true peptic ulcer syndromes as reported by other investigators. Practically all his patients complained of the irritable colon syndrome. The symptoms complained of were chronic constipation, unsatisfactory infrequent stools, incomplete stools, tenesmus, cathartic or enema habits, occasional attacks of diarrhea, abdominal distress under the left and right hypochondria and in the left iliac region, flatulence and belching. In some cases the gastric irritation syndrome was present. Heartburn in the epigastrium and sometimes under the left costal margin, which occurred several hours after eating, was relieved by sodium bicarbonate. While the gastric distress in anorectal disease resembles the peptic ulcer syndrome, it can be easily differentiated from true peptic ulcer by the diffuse area it involves, by its lack of definite periodicity and by x-ray study which does not reveal organic changes in the stomach or duodenum. The gastrointestinal symptoms are purely functional in character and clear up when the offending lesion at the anorectal region is corrected.

South Carolina Medical Assn. Journal, Greenville

35: 27-56 (Feb.) 1939

- My Experience with Transurethral Surgery of the Prostate Gland. W. R. Barron, Columbia.—p. 27.
 Urethral Stricture in the Female. I. A. Phifer and R. A. Way, Spartanburg.—p. 31.
 Practical Uses of the Levin Tube. J. A. Bradley, Florence.—p. 34.
 Gynecologic Endocrinology. J. D. Parker, Greenville.—p. 37.

Surgery, St. Louis

5: 161-326 (Feb.) 1939

- Polypoid Disease of the Colon: Proposed Surgical Procedure in Selected Cases. R. F. Hedin, Chicago.—p. 161.
 Gradual Complete Occlusion of the Celiac Axis, Superior and Inferior Mesenteric Arteries, with Survival of Animals: Effects of Ischemia on Blood Pressure. A. Blalock and S. E. Levy, Nashville, Tenn.—p. 175.
 *Effect of Partial Gastrectomy on Acidity and Peptic Activity of Gastric Juice. F. B. St. John, C. A. Flood and J. A. Gius, New York.—p. 179.
 Tuberculosis of the Stomach. L. Chaffin, Los Angeles.—p. 186.
 Critical Survey of Peritonoscopy. E. T. Thieme, Ann Arbor, Mich.—p. 191.
 Technic of Injection Treatment for Inguinal Hernia. H. I. Diegeleisen, New York, and I. J. Tartakow, New Rochelle, N. Y.—p. 202.
 *Gynecomastia. H. O. Wernicke, Chicago.—p. 217.
 Removal of Benign Tumors of Breast Without Visible Scars. W. W. Babcock, Philadelphia.—p. 226.
 Nonfatal Rupture of the Left Main Bronchus from External Trauma: Report of Case. F. W. Jones and P. P. Vinson, Richmond, Va.—p. 228.
 Acetylation of Sulfanilamide. J. D. Stewart, G. Margaret Rourke and J. G. Allen, Boston.—p. 232.
 Organization and Technic of the Blood Bank at the Philadelphia General Hospital: Experiences with 1,000 Transfusions. C. S. Cameron and L. K. Ferguson, Philadelphia.—p. 237.
 Operation for Dislocated Semilunar Bone of the Wrist. H. R. Mahorner and W. H. Meade, New Orleans.—p. 249.
 Effect of Experimental Hyperthyroidism and Hypothyroidism on Concentration of Cholesterol in Hepatic Bile. J. Johnson and Cecilia Riegel, Philadelphia.—p. 260.
 Etiologic Factors in Acute Appendicitis: Based on Study of 3,400 Cases. D. C. Collins, Los Angeles.—p. 267.
 Circumcision. E. L. Brodie, Buffalo.—p. 271.

Effect of Gastrectomy on Gastric Juice.—St. John and his colleagues analyzed the gastric secretion of twenty-six patients after partial gastrectomy for peptic ulcer. Eleven patients had originally suffered from gastric ulcer, thirteen from duodenal ulcer and two from combined ulcers. The interval which had elapsed between the operation and the time of examination varied from one month to nineteen years. Free hydrochloric acid was absent in twenty-two cases, diminished in three and within normal limits in one. Combined acidity exceeded 10 degrees in sixteen of the twenty-six cases and was as high as 24 degrees in a case of achlorhydria. The p_n of the gastric contents not containing free hydrochloric acid varied between 4.2 and 6.4 and was in the neighborhood of 5 in the majority of instances. The p_n of the specimens containing free acid was approximately from 1.2 to 1.4. No explanation could be found for the failure of anacidity to develop in four of the cases. Achlorhydria was usually manifested in patients recently operated on and in those operated on from five to fifteen years previously. There was no tendency for free acidity to persist in patients who had originally

suffered from ulcer of the duodenum. Two of the four patients whose gastric secretion still contained free hydrochloric acid had extensive gastric resections. It was impossible to determine in retrospect the amount of stomach which had been removed in many instances. The impression was gained, however, that the antral portion of the stomach had not been completely removed in some of the patients with anacidity. Determinations of pepsin were carried out in twenty-four cases. The results show a marked diminution in the peptic activity of gastric juice after partial gastrectomy in almost all instances. In all but three cases the amount of pepsin was found to be below the range found in patients with peptic ulcer who were not operated on. In two instances no peptic activity was demonstrable. The specimens which contained free hydrochloric acid showed relatively large amounts of peptic activity. Twenty-two patients of the group, twelve of whom have been followed for more than three years, have been completely free of symptoms of ulcer during the entire follow-up period. The remaining four patients have suffered from recurrent abdominal pain or melena, attributed in each instance to jejunal ulcer. In one of these patients the presence of jejunal ulcer was proved at exploration. The gastric juice of this patient contained free hydrochloric acid. The other three patients who had had recurrent symptoms showed anacidity. The studies offer no explanation for therapeutic failure in these cases. In most instances, however, the occurrence of achlorhydria after partial gastrectomy for peptic ulcer offers a satisfactory explanation for the successful results.

Gynecomastia.—Wernicke reports four cases of gynecomastia with similar characteristics. All but case 4 were unilateral. All gave a history of trauma. All occurred while the patients were in their teens. Not one of them showed any glandular evidence of disturbance except of the testicles and all but patient 2 had an atrophied left testicle. The Aschheim-Zondek test was negative in the three that were given treatment (testosterone propionate). The other, patient 3, was not examined as he did not return. Libido was increased in two of the three cases treated and was very much present in case 3. If case 2 were merely one of testicular hypofunction, for the testicles were equal in size, it might have been expected that testosterone would stimulate them enough to cause at least some change in the breast; but it had no apparent effect. Nor has anterior pituitary substance had any effect in this patient after two months of treatment. Favorable results were obtained in cases 1 and 4, as opposed to the unfavorable result in case 2, in spite of the fact that in all practically the same treatment was administered. This may be due to two factors. In cases 1 and 4 there was marked atrophy of the left testicle, while in case 2 the testicles were equal in size and apparently normal. In cases 1 and 4 the breast enlargement occurred earlier after puberty (at 16 and 14 years respectively) than in case 2, in which the breast enlarged when the patient was 19 years of age. Patient 4, whose breasts enlarged at 14 and whose treatment was given at 16, responded more quickly than patient 1, whose breast enlarged at 16 and received treatment at 20. Age, therefore, may be an important factor. The favorable outcome in two of the three cases of gynecomastia treated with testosterone propionate suggests that endocrine therapy should be given a thorough trial before surgical removal of the breast is advised. In case 1 enlargement of the breast recurred spontaneously, associated with recurring atrophy of the left testicle. The resumption of treatment with testosterone has produced no change in three weeks (after 165 mg. of the substance). This suggests that probably replacement therapy with testis hormone preparations at regular intervals will be found necessary to maintain a cure once it has been effected.

Wisconsin Medical Journal, Madison

38: 85-168 (Feb.) 1939

- Preparation of the Jaundiced Patient for Surgery. R. W. McNeal, Chicago.—p. 101.
 Prevention of Behavior Problems in Children Through Adequate Prenatal Care. R. A. Jefferson, Milwaukee.—p. 107.
 Sternal Marrow Aspiration. M. Hardgrove and L. J. Van Hecke, Milwaukee.—p. 111.
 Thoracoplasty: Analysis of Seventy-Seven Cases. E. R. Daniels and L. H. Kingsbury, Wales.—p. 114.
 Siles. A. G. Dunn, Stevens Point.—p. 117.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Anaesthesia, Manchester

16: 41-80 (Jan.) 1939

Premedication: Physiologic and Other Considerations. J. D. Stewart.—p. 41.

Ether Convulsions: Case. W. D. Steel.—p. 64.

The Teaching of Anesthetics. J. V. Human.—p. 67.

British Journal of Tuberculosis, London

33: 1-72 (Jan.) 1939

Clinical Aspects of Pneumothorax Therapy as Illustrated by Results Obtained in 191 Cases of Completed Treatment. O. Hjaltestad and K. Törning.—p. 4.

Some Observations on Alpine Climate. B. Hudson.—p. 16.

Tuberculous Tracheobronchitis. F. C. Ormerod.—p. 29.

Etiology and Pathology of Tuberculous Empyema. A. H. Penington.—p. 36.

*Role of Arthrodesis in Tuberculosis of the Hip Joint. E. H. A. Pask.—p. 42.

Asbestosis of the Lungs: Case. P. Arnold, J. R. Beal and H. A. Cookson.—p. 45.

The Spero Industries.—p. 48.

Arthrodesis in Tuberculosis of Hip Joints.—Pask states that over a period of four and a half years 131 patients (seventy-six adults and fifty-five children) have been admitted to Wrightington Hospital with tuberculosis of the hip. Arthrodesis was performed on eleven of these patients (nine adults and two children). It is the author's practice to operate only when the disease may be said to be reasonably quiescent. In very young children such an extensive operation is never justifiable. Arthrodesis of the hip is not a life-saving measure; its purpose is the conversion of a weak, yielding ankylosis into a sound, immobile, painless fixation which will not yield to weight bearing and will not alter its angle at a later date. The combined operation of intra-articular and extra-articular arthrodesis has been done whenever possible. The combined procedure has the advantage of removing all the diseased tissue at the time of the operation, and if for any reason the extra-articular fixation is unsuccessful there is a possibility of a firm ankylosis following the approximation of the denuded femur and acetabulum. The graft in every case was taken from the anterior part of the ilium. The lower part of the graft was not detached from the ilium before it was turned down; this is important, as the chances of the graft taking are considerably increased by adopting this method. In eight of the eleven patients operated on healing occurred by first intention, in three the wound broke down and of these one ultimately died with multiple sinuses. A firm bony ankylosis in good position was obtained in nine cases; in one case the ankylosis was not absolutely firm, but the patient was working and suffered no disability; the patient who died also showed a bony ankylosis in spite of severe suppuration. Five of the patients are working at their normal occupation, three are fit for work but are unemployed, one is doing domestic duties at home and only one is unfit for work.

British Medical Journal, London

1: 147-198 (Jan. 28) 1939

Special Field of Neurosurgery. G. Jefferson.—p. 147.

Unusual Case of Lead Poisoning. G. E. Beaumont and R. W. Burn-Mason.—p. 150.

Plea for the Freer Use of Blood Transfusion in Obstetrics. J. Stallworthy.—p. 153.

*Nature of Growing Pains and Their Relation to Rheumatism in Children and Adolescents. J. C. Hawksley.—p. 155.

Congenital Occlusion of Posterior Nasal Choanae. D. B. Kelly.—p. 157.

*Erythema Nodosum Associated with Acute Tuberculous Cervical Lymphadenitis. B. C. Thompson.—p. 159.

Relation of Growing Pains to Rheumatism.—After a lapse of four years Hawksley reexamined sixty-four unselected cases from the 115 cases of growing pains seen in 1934. None showed any evidence of cardiac involvement. Adding these cases to Sheldon's, it is seen that of 253 children followed up for four years at the Hospital for Sick Children evidence of rheumatic heart disease developed in only two, or less than 0.8 per cent. The incidence of cardiac rheumatism in 301,392 school children examined in 1936 was 0.8 per cent. Growing pains and rheumatism resemble each other only to the extent that both produce

pain in the limbs. A correct differential diagnosis is imperative, for, while rheumatic cases with potential carditis should be treated by rest, it is bad to make invalids out of children with growing pains by treating them for rheumatism. The following clinical features serve to distinguish the two conditions: 1. Rheumatism affects joints and is usually accompanied by tenderness on pressure and movement. There may be redness, swelling or effusion. In growing pains, muscles, ligaments and tendons are usually the site of the pain; tenderness is rare and there is no swelling, effusion or redness. The pain is more nagging and more likely to cause crying in the nonrheumatic case. 2. In growing pains a cause of the pain is often found in postural or orthopedic defect. Tiredness and vague ill health are common to the two diseases, but patients with growing pains are usually sulky and unsociable; this, in the author's experience, is uncommon in rheumatism. 3. Nodules do not occur except in rheumatism. 4. There is no significant change in the temperature in cases of growing pains. There is also no tachycardia. 5. Cases of growing pains as a rule show no anemia; rheumatic cases frequently do. 6. In cases of growing pains there is no antecedent sore throat. 7. There is no lengthening of the PR interval on electrocardiography in cases of growing pains.

Erythema Nodosum and Tuberculous Lymphadenitis.—Thompson describes six cases of erythema nodosum associated with acute tuberculosis of the cervical lymph nodes. The tuberculous infection is believed to be recent and to have gained entrance by way of the tonsil in three, septic follicular tonsillitis having been a contributory cause of this port of entry and possibly also of the subsequent softening and suppuration of the tuberculous lymphadenitis. In the other three cases, tuberculosis was known to have been present for a number of years. The exacerbation in the cervical lymph nodes concurrent with the onset of erythema nodosum is attributed to reactivation of tubercle bacilli latent in the lymph nodes in two cases and in the pulmonary parenchyma in the third case. However, the possibility of exogenous superinfection must be admitted. The pathogenesis of the cutaneous lesions is discussed and their identity as hematogenous tuberculous foci is suggested by the concomitant phlyctenular keratoconjunctivitis in two cases. These lesions underwent exacerbation and remission more or less coincidentally. This occurrence suggests that erythema nodosum may signalize the development of resistance by the host in addition to cutaneous hypersensitiveness, or in other words the accompaniment of allergy by immunity. The paradox of an effect at once beneficial to the lymphadenitis and deleterious to the phlyctenular disease accords with Rich's theory of immunity and allergy as separate, even antagonistic, entities, the latter causing cessation and destruction in defensive tubercles built up by the former.

Indian Medical Gazette, Calcutta

74: 1-64 (Jan.) 1939

Etiology of Tropical Macrocytic Anemia. L. E. Napier.—p. 1.

Pathogenesis of the Commoner Types of Splenomegaly Met with in India.

M. N. De and B. P. Tribedi.—p. 9.

Study of Treatment of Tetanus Based on a Review of Thirty-Eight Cases from the Year 1932-1937. M. G. Kini and S. Venkateswara.—p. 14

Mapharside in Treatment of Syphilis: Clinical Study. R. V. Rajani and N. Vasudeva Rao.—p. 24.

*Probable Cause of the Difficulty of Treating Chronic Amebic Infection in This Country. H. Ghosh.—p. 27.

Intra-Uterine Infection of the Fetus with *Leptospira Icterohaemorrhagiae*. B. M. Das Gupta.—p. 28.

New Method for Determination of Small Quantities of Cocaine in Presence of Novocaine. K. N. Bagchi, H. D. Ganguli, P. N. Mukerjee and J. N. Banerjee.—p. 29.

Further Observations on Leptospiral Infections in Calcutta. B. M. Das Gupta.—p. 31.

Cause of the Difficulty of Treating Amebiasis.—It is generally known that acid reaction of stools favors the life and growth of *Endamoeba histolytica*. On this hypothesis Ghosh treated three patients with chronic amebiasis, whose stools were highly acid to litmus, with one course of six injections of 1 grain (0.065 Gm.) of emetine followed by the oral administration of freshly prepared liquid extract of kurchi for twelve consecutive days while the patients were kept mainly on a protein diet with a restricted amount of carbohydrate. The stool turned alkaline after forty-eight hours. The restricted diet was enforced in each

instance for four weeks and the patient was advised to test the reaction of the stool daily with litmus paper. The restriction of diet was lifted after four weeks but the patients were instructed to avoid rice and sweets as much as possible. During the period of observation several examinations of the stools of each were made; up to the time of writing all three patients were free from amebas. The patients had been following instructions regarding diet, though they said that it was hard to avoid rice and sweets. The general health of these patients has greatly improved. The author draws no conclusion but does suggest that in treating cases of chronic amebiasis strict attention should be paid to the adjustment of the diet in such a way as to keep the reaction of the stool alkaline. Alkali by mouth can change the reaction of the urine but has little influence on the reaction of stools. A change to atta from rice changes the reaction of the stool from acid to alkaline.

Irish Journal of Medical Science, Dublin

No. 157: 1-48 (Jan.) 1939

- Medicine: Yesterday, Today and Tomorrow. W. Langdon-Brown.—p. 1.
Hospitals and Public Health. C. J. McSwecney.—p. 15.
Crime and the Doctor. J. Shiel.—p. 26.
Some Aspects of Ancient Medicine. M. E. Tapissier.—p. 36.

Lancet, London

1: 129-188 (Jan. 21) 1939

- Rehabilitation of the Injured Workman, with Special Reference to the Workmen's Compensation Act. D. Stewart.—p. 129.
*Placental Blood for Transfusion. J. Howkins and H. F. Brewer.—p. 132.
*Prophylaxis of Tuberculous Emyema. L. Roberts.—p. 134.
*Renal Changes in Malignant Hypertension: Experimental Evidence. C. Wilson and F. B. Byrom.—p. 136.
Interruption of Coma in Insulin Shock Therapy. R. Fraser and D. A. Stanley.—p. 140.
Gastric Secretions During Pathologic Hypochloremia. B. M. Nicol and A. Lyall.—p. 144.
Surgical Procedure for Ulcerative Colitis. J. F. Gaha.—p. 146.
*Miners' Dyspnea. J. N. Peterson, J. M. Peterson and C. W. Startup.—p. 147.

Placental Blood for Transfusion.—The average quantity of placental blood that Howkins and Brewer collected from fifty consecutive women at term is small, 47 cc., which compares unfavorably with Goodall's and Grodberg's figures of 125 and 105 cc. respectively. This small yield would necessitate the mixture of from ten to twelve samples to supply the bulk of blood usually employed in an adult transfusion and it is questionable whether this extensive pooling of several bloods, although of the same group, is entirely devoid of the risk of the minor subgroup reactions of agglutination. With regard to sterility, 22 per cent of the samples were contaminated with airborne or genital tract organisms (*Bacillus subtilis*, *Bacillus coli*, *Bacillus pyocyaneus* and *Streptococcus albus*) after a reasonably aseptic technic. The authors can agree neither with Goodall in his assertion that culture of the collected blood is unnecessary nor with Grodberg in his statement that any stray organisms present are usually killed by the leukocytes—a statement which they have proved to be incorrect, in that their second culture always tallied with the first, and organisms if present on the seventh day of storage always survived up to the time of subsequent culture. This source of blood for transfusion, however carefully perfected the technic of its collection, sterilization and storage may become, is unlikely to rival seriously that available through the voluntary donor system.

Prophylaxis of Tuberculous Emyema.—The incidence of tuberculous empyema in patients with artificial pneumothorax is about 10 per cent and its fatality rate, in published reports, about 50 per cent. Therefore it seems to Roberts that prevention seems especially important. He suggests that persistent or recurrent pleural pain over the lesion indicates severe tuberculosis of the pleura, which contraindicates artificial pneumothorax. The risk of empyema is sufficiently great to make some other form of collapse therapy advisable. The object of artificial pneumothorax is relaxation, not compression, of the lung. High positive pressures to "stretch the adhesions" are not justifiable. After adhesions have been cauterized and collapse has been instituted, a pneumothorax which remains ineffective should be promptly abandoned and other collapse therapy substituted. Oleothorax and extrapleural pneumothorax are valuable in certain cases.

Renal Changes in Malignant Hypertension.—Wilson and Byrom present evidence that chronic interstitial nephritis may be caused by hypertension alone. Compression of one renal artery of 157 rats gave rise to hypertension in 101 (65 per cent). The blood pressure may be elevated as early as eighteen hours after the operation or may begin to rise at any time during the first four weeks. The course of the hypertension varies considerably, but in general two types were recognized: 1. That in which the blood pressure rises gradually over a period of several weeks to reach a steady high level, which has been maintained for nine months in animals still under observation and appears to be consistent with normal health. 2. That in which the hypertension runs a more irregular course and often leads to a state of great weakness, wasting, coma and occasionally convulsions. The close resemblance between the renal lesions produced in the rat by experimental hypertension and those found in cases of malignant hypertension in man bespeaks a common pathogenesis. It provides experimental support for the clinical evidence that malignant hypertension is a form of essential hypertension of which renal disease is but a terminal manifestation. Since a similar picture occurs in the hypertensive rat under conditions which apparently exclude the influence of "toxic" agents, the authors infer that inflammatory changes can result from a hypertension severe enough to produce arterial necrosis. The demonstration that arterial lesions can be produced in the kidney by experimental hypertension also throws light on the clinically malignant course of the human disease; for when vascular lesions occur in malignant hypertension as a result of the high blood pressure they will presumably give rise to a reduction in renal blood flow. This may be expected to aggravate the hypertension, and so a vicious circle will be established in which a rising blood pressure is associated with progressive renal destruction. It appears that not only "essential" hypertension but also hypertension secondary to renal disease can set in motion the vicious circle. This "malignant termination" has therefore no specific character derived from the original disease but is an attribute of the high blood pressure which is common to all. The clinical symptoms in the hypertensive rat are closely related to the human disease. In animals moribund from this condition immediate and lasting improvement, with return of the blood pressure to normal, has been produced by excision of the ischemic kidney. The syndrome appears to be a close counterpart to hypertensive encephalopathy in man (the pseudo-uremia of Volhard).

Miners' Dyspnea.—The Petersons and Startup examined thirty-six coal miners whose respiratory disability (dyspnea) was such that they have had to give up their occupation. From this they conclude that the vital capacity per unit of body surface gives, in these instances, a more reliable estimate of the degree of respiratory incapacity than do the roentgenograms.

Medical Journal of Australia, Sydney

1: 49-92 (Jan. 14) 1939

- Sulfanilamide and Other Compounds. R. Beard.—p. 52.
Experiences in Treatment of Urethritis by Sulfanilamide. G. Jose.—p. 54.
Clinical Application of Some of the More Recent Pharmacologic Preparations. K. S. Hetzel.—p. 56.
Orthoptic Treatment of Concomitant Convergent Strabismus. J. R. Anderson and Diana S. Mann.—p. 59.
Further Experiences in Insulin Treatment of Schizophrenia. P. G. Reynolds.—p. 65.
Diverticulosis and Diverticulitis: Autopsy Results. J. B. Cleland.—p. 70.

South African Medical Journal, Cape Town

13: 1-36 (Jan. 14) 1939

- Study of 100 Cases of Head Injury. K. Sartorius.—p. 1.
Provisional Stable Standard for Cobra Antivenene and Its Practical Application. M. H. Finlayson and J. M. Grobler.—p. 9.
Leuko-Erythroblastic Anemia: Report of Three Cases. J. Gear and L. H. Becker.—p. 13.
Clinical Studies of the Bactericidal Power of Blood. E. Matthijssen.—p. 15.
Energy Requirements of Normal Adults. E. E. Buttner.—p. 25.
Respiratory Properties of Lymphocytes and the Lymphatic Spread of Cancer. E. E. Faerber.—p. 27.
Three Cases of Unusual Tendon Injuries. J. J. Levin.—p. 29.
Notes on the Distribution of the "Knoopiespinnekop" (*Larodectus Inductus*). R. H. N. Smithers.—p. 33.
Complications in Tick-Bite Fever: A Survey of Fifty Cases. J. Gear.—p. 35.

Archives des Maladies de l'Appareil Digestif, Paris

29: 1-120 (Jan.) 1939

Secretion Test in Disorders of Pancreas. M. Chiray and M. Bolgert.—p. 5.

Studies on Metabolism of Vitamin C. M. Vauthey.—p. 33.

*Investigations on Hypoglycemia. F. Turyn.—p. 41.

Latent Chronic Pancreatitis. J.-V. Grott.—p. 57.

Investigations on Hypoglycemia.—Turyn says that, since the introduction of insulin in the therapy of diabetes mellitus, hypoglycemia has become more and more frequent and now the symptoms of hypoglycemia are well known. In severe cases they are general weakness, asthenia, abulia, sweats, hunger, tremor, shock, headache, vertigo, diplopia, convulsions, delirium and hypoglycemic coma. In the mild cases the symptoms recall excitation of the sympathetic. There are many theories about the pathogenesis of the symptoms of hypoglycemia but the majority of authors explain their appearance by epinephrine counter-regulation. The author says that signs of hypoglycemia concur with widely differing blood sugar levels. Nevertheless, in the majority of cases subjective signs appear with values of from 80 to 70 mg. per hundred cubic centimeters and objective symptoms are generally noticeable with values of from 70 to 50 mg. per hundred cubic centimeters. The simultaneous determination of the sugar content of the venous and of the capillary blood gives variable results. In this report the author is concerned chiefly with this difference in the capillary and venous glycemia and with its relation to the signs of hypoglycemia. He made a series of investigations to determine whether the diverse signs of hypoglycemia are connected with the augmentation or diminution of the difference between capillary and venous glycemia. He determined the sugar content, according to the method of Hagedorn and Jensen, of blood specimens that were obtained from the finger and from the ulnar vein of the same member. From 20 to 30 units of insulin was injected while the persons were still fasting and then observations were made on the pulse rate and the arterial tension; moreover, the persons were carefully watched for signs such as flushing, pallor, dryness of the mouth, generalized tremor and hunger. Studies were made in sixteen cases. On the basis of these observations the author arrived at the conclusion that the symptoms of hypoglycemia appear in relation to the variations of assimilation of sugar in the peripheral tissues, that is to say with the augmentation or the diminution of the difference of the capillary-venous glycemia. The augmentation of this difference manifests itself as a hypoglycemia of great intensity, in which the symptoms of excitation of the vagus nerve dominate. This is then an insulin intoxication. The diminution of the aforementioned difference is accompanied by the symptoms of epinephrine shock. The absence of signs of hypoglycemia, in spite of a low glycemia, can be explained by the absence of variations of assimilation of sugar in the periphery. Epinephrine shock appears when the hyper-epinephrinemia succeeds in mobilizing the glycogen of the liver.

Journal de Radiologie et d'Electrologie, Paris

23: 1-48 (Jan.) 1939

Roentgenologic Discoveries in Exploration of Biliary Passages. J. A. Saralegui.—p. 1.

Difficulties in Execution and Interpretation of Electrodiagnosis in Nursing. Piffault.—p. 15.

*Roentgen Therapy of Furuncles. G. Ronneaux, H. Desgrez and F. Degand.—p. 17.

Tubes for Roentgen Therapy with High Intensity: New Model; Exterior Anticathode. J. Belot.—p. 19.

Roentgen Therapy of Furuncles.—Ronneaux and his associates point out that roentgen therapy of furuncles produces such favorable results that this treatment is being rapidly adopted in France. In this paper they report observations on twenty-six patients who had either grave furuncles (of the face) or carbuncles. A table listing the twenty-six cases indicates the localization of the furuncles or carbuncles, the type of irradiation, the number of treatments, the number of roentgens administered at each session, the total dose and the outcome of the treatment. The first five patients were irradiated with soft rays, the tension being 120 kilovolts and the filter consisting of 1 mm. of aluminum. Another group of six patients was treated with harder rays; the tension was 150 kilovolts and the filter consisted of 0.2 mm. of copper and 2 mm. of aluminum. In the last group of patients the authors employed 180 kilovolts filtered

through 0.5 mm. of copper and 2 mm. of aluminum. They gained the impression that the harder type of rays effected a more rapid improvement. In the majority of cases, 50 roentgens each was given in the first two sessions and 100 roentgens in a third session. The treatments were given every other day, so that five days was required. To be sure, in some of the cases the total dosage was greater and a longer period was required. The majority of the patients had furuncles of the face, and the authors observed no grave complications in the course of the evolution. Some had generalized furunculosis. It is difficult to render an opinion on the effect of irradiation of a furuncle on the evolution of furunculosis. The authors gained the impression that the treatment of a furuncle modified the evolution of furunculosis favorably, but they learned that several of the patients had relapses after temporary remissions.

Presse Médicale, Paris

47: 217-240 (Feb. 11) 1939

Studies on Motivity of Bronchi. L. Binet and M. Burstein.—p. 217.

After Twenty Years of Gastric Surgery for Ulcer of Stomach. J. Abadie.—p. 219.

*Tuberculosis and Anal Fistula. R. Kaufmann.—p. 221.

Tuberculosis and Anal Fistula.—Kaufmann says that anal fistulas are in many instances tuberculous. Observations in 101 cases led him to think that it is extremely difficult or even impossible to furnish the proof that a fistula is tuberculous. He shows that the frequency of tuberculous anal fistulas has been exaggerated, because numerous reports in France as well as elsewhere have been based on insufficient evidence. He thinks that some want to justify the belief in the habitual concurrence of tuberculosis and anal fistulas, because this conjecture has the advantage of excusing therapeutic failures. Discussing the histologic aspects and particularly the appearance of giant cells he says that, although it is well known that giant cells are not specific for tuberculosis, reports on tuberculous anal fistulas frequently have no other basis than the microscopic demonstration of giant cells. In the course of fifty-four operations for anal fistulas the author found giant cells in six patients. In three of these the local and general evolution indicated a tuberculous process. But the author does not believe that this was the case in the other three, for the latter patients did not have tuberculosis and they were completely cured. After reporting the clinical histories of these patients the author discusses anal fistulas in patients with pulmonary tuberculosis and relates the histories of fourteen. In the evaluation of his entire material of 101 cases, he first repeats that in the aforementioned fifty-four cases of anal fistulas he detected three that were of a tuberculous nature. In a group of thirty-two patients with anal fistulas he failed to detect a single tuberculous case. Thus in a total of eighty-six cases of anal fistula only three were found that were of a tuberculous nature. Even if the fifteen cases from a department for pulmonary tuberculosis are added, it can be said that in 101 operations for anal fistula the tuberculous nature of the fistula was detected ten times at the most. Returning to the difficulty that is involved in deciding whether an anal fistula is tuberculous or not, the author says that, if the presence of giant cells does not have absolute diagnostic value and if the aspect of the fistula, the presence of pulmonary tuberculosis or the weak condition of the patient are not sufficient proof, all the same the morbid entity of tuberculous fistula does exist and it is necessary to affirm it in the presence of the concordance of the three factors which, when isolated, are not convincing. These factors are poor aspects of the fistula, giant cells and pulmonary tuberculosis.

47: 241-256 (Feb. 15) 1939

*Late Results of Treatment of Bronchial Asthma by Stellectomy. R. Leriche and R. Fontaine.—p. 241.

*Treatment of Staphylococic Infections by Crude and Purified Specific Anatoxin. A. Bocage, P. Mercier and R. Richou.—p. 243.

Stellectomy in Bronchial Asthma.—Leriche and Fontaine review the late results of stellectomy in bronchial asthma, pointing out that thus far they have employed this surgical therapy in fourteen cases of bronchial asthma. Two of the cases were lost sight of and so the authors were able to determine the late results in only twelve. After giving brief histories of

these cases, they summarize the results in a table. The fifth patient underwent three interventions: chondrectomy, which failed, stelletomy, which seemed to aggravate the condition, and vagotomy, which ameliorated the disorder for about a year, after which time the patient was lost sight of. This case is also excluded from the estimation of the late results and so only eleven cases remain, in all of which either unilateral (left side) or bilateral stelletomy was done. In six of these eleven cases, that is, in approximately 55 per cent, the results were favorable. Complete cessation of the asthmatic attacks was observed in two of these cases for periods of thirteen and seven and one half years respectively. In another case there was complete cessation of the attacks for seven years and then there was a partial relapse. In three other cases great improvements were observed, which still persisted after four, five and one half and two and one half years. In five cases, that is in about 45 per cent, the stelletomy failed to produce lasting improvement of the bronchial asthma. The authors think that, among the different surgical methods which have been recommended for bronchial asthma, stelletomy is the method of choice, because the technic is simple and outside of Bernard-Horner's syndrome it causes no neuromyolytic sequelae. Infiltration of the stellate ganglion is regarded as a surgical adjuvant; it suppresses the severe asthmatic attacks and thus time is gained; moreover, to a certain extent it may be helpful in selecting the cases that will respond favorably to an operation. The authors conclude from their studies that, when all other treatments have failed, an operation on the sympathetic can be tried to improve the lamentable condition of patients with asthma.

Specific Anatoxin in Staphylococcal Infections.—Bocage and his associates point out that in 1929 Burnet obtained for the first time a true staphylococcal toxin. This prepared the way for the production of a staphylococcal anatoxin (toxoid) analogous to the diphtheric anatoxin (toxoid) of Ramon. The authors have treated staphylococcal infections with a specific toxoid since 1934. In an earlier report (*Presse méd.* 43:1137 [July 17] 1935; abstr. *THE JOURNAL*, Sept. 28, 1935, p. 1080) they described the results which they obtained in approximately 100 cases. In the course of the ensuing years they followed as much as possible the fate of their first patients and treated hundreds of new ones and they always found the therapeutic activity of toxoid superior to all the other treatments. In the present report they examine the results that were obtained since June 1937. Following a discussion of toxicogenesis in staphylococci they give their attention to the clinical study of cutaneous staphylococcal infections. Regarding the mode of application of the toxoid, they say that it is necessary first to test the allergic susceptibility of the subject by subcutaneous injection of 0.1 cc. of the toxoid. If this first injection produces neither fever nor local reactions, treatment is continued with 0.25, 0.5, 1 and 2 cc. The injections are given hypodermically into the supraspinous fossa or into the flank at average intervals of four days. It should not be neglected to precede the treatment by an albumin test of the urine; if this test is positive, it is advisable to defer the toxoid treatment. In subjects who are sensitive to vaccines, the treatment should be begun with 0.05 cc. This dose should be repeated two or three times at two day intervals and, if reactions are absent, the treatment can be continued with the usual doses. In children the toxoid therapy should likewise be begun with 0.05 cc. and this dose should be followed by 0.1, 0.25 and 0.5 cc. The clinical results which the authors obtained with the toxoid are indicated in tables and several case histories are reported. In the conclusion they state that, on the basis of more than 2,000 observations, the efficacy of specific toxoid in the treatment of staphylococcal infections, particularly those of the cutaneous type, appears incontestable. They hope that in the near future they will be able to proceed with more success against the grave forms of staphylococcal infections, especially the septicemias and osteomyelitis. This will be possible when they have at their disposal a purified toxoid of an antigenic power that is still higher than is available at present. Numerous observations made by the authors and by other clinicians and experimental studies confirm their opinion that the antitoxin plays the essential part in the mechanism of antistaphylococcal immunity.

Annales Pædiatrici, Basel

152:253-308 (Feb.) 1939

- *Problem of Etiology of Infantile Acrodynia. R. Debré and A. Névet.—p. 253.
- Induced Premature Birth and the Triad Grave Familial Icterus, Congenital Anemia and Universal Congenital Hydrops. Cornelia de Lange.—p. 277.
- Vitamin C Metabolism of Healthy and Diseased Children. L. F. Meyer and P. Robinson.—p. 283.
- Sulfur and Protein Metabolism of Breast Fed and Artificially Fed Nurlings. S. Blazsó.—p. 302.

Etiology of Infantile Acrodynia.—Debré and Névet call attention to the fact that one of them (Debré) suggested in 1927 that ergotism, ustilaginism, infantile acrodynia (pink disease or erythroderma) and pellagra belong to the same nosologic group. Recent reports by Mayerhofer and Dragisic confirm this view. In ergotism and ustilaginism the toxic-alimentary origin has been definitely established and the authors think that the same etiologic factor plays a part in acrodynia and pellagra, although for the latter two disorders the exact cause of the alimentary intoxication has not been demonstrated as yet. In their experiments on animals (mice and monkeys) they show that symptoms similar to those of the aforementioned diseases (vasomotor, trophic and paralytic symptoms) or even death can be produced by feeding the animals with extracts of ergot, of *Ustilago segetum*, of brown rust of wheat (*Tilletia tritici*) or of the seeds of corncockles. The animal experiments demonstrated particularly the toxicity of brown rust of wheat, contained so frequently in human foods, but also of blight of wheat and of the seeds of corncockles, which are more rarely ingested. Numerous epidemiologic investigations undertaken by the authors in different parts of France failed to establish that in the regions where infantile acrodynia was prevalent the food taken by the children or the fodder of the cows contained the aforementioned toxic substances. Nevertheless the etiologic problem remains and in order to ascertain the etiology of acrodynia and to see whether the theory of a toxic-alimentary origin is right it is necessary to study carefully the dietary regimen of the little patient and the possible parasitic infestation of his food, including the milk, which may contain toxic substances of a vegetable origin.

Schweizerische medizinische Wochenschrift, Basel

69:141-164 (Feb. 18) 1939. Partial Index

- Late and Early Diagnosis of Intraspinal Tumors. W. P. Van Wagenen and J. Rossier.—p. 141.
- Acute Myeloblastic Leukemia (Leukemia and Pregnancy). W. Tschopp.—p. 146.
- *Aspects of Erythroblastoses of the Newborn. A. Albrecht.—p. 146.
- Hemolytic Icterus (Hemolytic Constitution) and Gastric Changes. S. Brandli.—p. 149.
- *Nontropical Sprue and Pregnancy. A. Spreng.—p. 150.

Erythroblastoses of the Newborn.—Albrecht says that the collective term of erythroblastosis of the newborn was applied at first to hydrops foetus universalis, icterus gravis familiaris and congenital anemia. Later the term erythroblastosis was extended to include several disorders of nurslings and young children such as Cooley's anemia, the erythremia of Italian authors and Jaksch-Hayem's anemia (anemia infantum pseudoleukemia). About the nature of the erythroblastoses, the opinions are divided. On the one hand they are regarded as a nonspecific reaction of the hemopoietic organs to a previous noxa, on the other hand as systemic diseases. The author shows that the various forms of erythroblastoses differ in severity but have several symptoms in common. The first of these is the erythroblastosis, to which is added a more or less severe flooding out of myeloid cells; the second symptom which they have in common is the swelling of liver and spleen and the third one is anemia. Another factor which indicates that the diseases belong together is their frequent familial concurrence; it has been observed that two or three forms occur in the same family. After reviewing the clinical aspects of hydrops foetus universalis, of icterus gravis and of congenital anemia, the author describes four cases that were observed at the children's clinic in Basel. In the summary he emphasizes that erythroblastosis cannot be regarded as a primary disease of the blood but as a reaction of the fetal hemopoietic organs to a previous noxa. The hematologic symptom is nearly

always present but often only for a brief time; however, it permits the early diagnosis and a suitable treatment. In the reported cases the treatment consisted of injections of a liver preparation and of parental blood and in some cases of blood transfusions.

Nontropical Sprue and Pregnancy.—Spreng says that a review of the recent literature on anemia in pregnancy discloses little about nontropical sprue in pregnant women. He gives a detailed report of a case observed at his hospital concerning a woman who had nontropical sprue, bronchiectasis and pulmonary tuberculosis. In the course of a triplet pregnancy the conditions became greatly exacerbated. The spontaneous, premature delivery of the triplets was followed by grave complications that threatened the life of the patient. The recovery was slow. The author cites another case of megalocytic anemia in a pregnant woman who was hospitalized only at the end of her pregnancy, when she was in a poor and cachectic condition. She died shortly after the delivery as the result of circulatory weakness. In both of these cases the pregnancy severely complicated the nontropical sprue, and the author concludes that it is advisable to interrupt the pregnancy in such cases. Regarding the therapy, he says that in the first case treatment with yeast was the only measure which was really effective. Cases of sprue which develop during pregnancy and perhaps as a result of it are unknown to the author. However, he thinks that the megalocytic anemias, which are so frequently observed in the tropics in pregnant women who have a B₁₂ insufficiency, might perhaps be considered in this connection.

Archivio Italiano di Anatomia, Bologna

9: 259-376 (Jan.) 1939

*Arteriosclerosis of Brain and Spinal Cord, Especially in Relation to Arteriosclerosis in Other Parenchymal Vessels and to Cerebral Hemorrhage and Softening. G. Lanza.—p. 259.

Total Inversion of Viscera: Case. S. Mondolfo.—p. 338

Pseudocystic Cavities of Pellucid Septum: Pathologic Significance. F. Cottoni.—p. 349.

Arteriosclerosis of the Central Nervous System.—Lanza made an anatomic and microscopic study of the brain and spinal cord and of other structures in the bodies of seventy-five patients who died between the ages of 54 and 96 years from arteriosclerosis, vascular diseases and diseases other than vascular. The author found that arteriosclerosis of the cerebral vessels is frequent in persons over 60. The disease is more acute in the intraparenchymal than in the extraparenchymal vessels and in the nuclei of the base, especially the lenticular nucleus, than in the cerebral cortex and the spinal cord. In the cerebral cortex the lesions of the gray matter predominate over those of the white matter. Cerebral arteriosclerosis frequently exists in association with arteriosclerosis of the renal-splenic and cardiac gastrointestinal territories. The microscopic aspect of cerebral arteriosclerosis is different from that of arteriosclerosis in the parenchymal vessels of other organs. The hyperplastic delamination of the internal elastic coat of the arteries is moderate. Hyalinosis of a special type, calcification (at the globus pallidus) and arterionecrosis (at the putamen) are frequent. Arteriosclerosis of the spinal cord is more rare and less acute than that of the brain. The former frequently develops in association with the latter. Acute lesions of the wall of the vessels (arterionecrosis) exist at the nuclei of the base of the cerebral territory opposite that in which cerebral hemorrhage took place. The lesions of the nonhemorrhagic area are different from those at the hemorrhagic foci. They tend to break and to form millary aneurysm of the Charcot-Bouchard type. The lesions of the vessels in cerebral softening follow a chronic evolution which frequently shows the most common aspect of cerebral arteriosclerosis. They tend to diminish the lumen of the vessels and to form a mechanical obstacle to circulation. The author believes that there are two different forms of cerebral arteriosclerosis. The benign form follows a chronic evolution, induces the most common aspects of cerebral arteriosclerosis in the cerebral arteries and ends in formation of cerebral softening. The malignant form follows an acute evolution, induces necrosis of the arteries and ends in cerebral hemorrhage.

Gazzetta degli Ospedali e delle Cliniche, Milan

60: 1-24 (Jan. 1) 1939

*Tumors of Male Breast. G. Bragagnolo.—p. 3.

Tumors of Male Breast.—Bragagnolo reports the occurrence of cancer and of fibro-adenoma of the breast in two men aged 63 and 56 respectively. The conditions are rare. An early diagnosis from the clinical examination of the patient only is difficult. Cancer of the breast develops as a rule in men over the age of 50. The clinical diagnosis is made by exclusion of several other diseases of the breast, especially tuberculosis, syphilitic gumma, chronic mastitis, fibro-adenoma and sarcoma. The tumor cannot be delimited by palpation of the breast. It is continued at some points with the surrounding tissues and joins the skin at other points by means of adhesions. It has lateral lobular nodules which can be felt by palpation of the breast. The condition may follow either a long or an acute evolution. Recurrences may or may not occur. The prognosis depends on the type of the tumor and the opportunity of an early operation, which consists in amputation of the breast and emptying of the axillary cavity. Fibro-adenoma can be delimited by palpation of the breast. The tumor forms neither adhesions to the skin nor lobular lateral nodules. The condition generally follows a benign evolution but may evolve to cancer. Therefore amputation of the breast with removal of the fascia of the large pectoral muscle is indicated. In the case of the cancer reported by the author there was no history of local trauma and of heredity and the patient did not suffer from tuberculosis or syphilis. In the case of fibro-adenoma there was a history of local trauma and of heredity. The clinical diagnosis was confirmed in both cases by the results of the microscopic study of the tumors that were removed by operation. Both patients are in good health and without recurrences (or metastases in cancer) up to now (more than three years in the case of cancer and more than one year in that of fibro-adenoma). The operation in both cases consisted in amputation of the breast followed by either emptying of the axillary cavity (cancer) or removal of the fascia of the large pectoral muscle (fibro-adenoma).

Archiv für Kinderheilkunde, Stuttgart

116: 1-80 (Jan. 24) 1939. Partial Index

Results of Follow-Up Examinations of Forty-Five Rachitic Children Who Had Been Treated with Concentrated Vitamin D₂. R. Schirmer.—p. 1.

*Vitamin C Consumption in Nurslings and Young Children. Erika Mager.—p. 12.

Primary Tuberculosis of Skin in Nurslings and Young Children: Secondary Formation of Lupus; Four Cases. G. Schachenmann.—p. 33.

Different Development of Paratyphoid in Siblings Contracting Disease Simultaneously. H. Wulf.—p. 53.

Frequent Development of Pneumococcal Diseases in Home for Nurslings. W. Goeters.—p. 60.

Rare Deformity of Vascular System as Cause of Attacks of Suffocation. W. Koch.—p. 63.

Bronchial Asthma in Children. J. Cirlea and L. Bogdan.—p. 65.

Vitamin C Consumption in Infants.—In the introduction to this report, Mager directs attention to the fact that C avitaminosis, scurvy, is relatively rare but that C hypovitaminosis has a high incidence. Further she discusses the vitamin C requirements of the human organism and mentions the different methods that have been recommended for the determination of this vitamin in the fluids of the body. In her own tolerance tests with vitamin C she employed the titration method by means of dichlorophenolindophenol and the litmus paper method of Scheer. All urine specimens were examined with both methods, and the comparison of the results disclosed that in most instances the results were practically identical. The tolerance tests were made on eleven nurslings and on eleven young children; a smaller or larger vitamin C deficit was detected in all of them. In nurslings the deficit was nearly always greater than in the young children. The vitamin consumption of nurslings was found to be relatively high in comparison to that of adults and it was also greater than that of young children. The vitamin C requirements of breast-fed nurslings were found to be lower than those of the bottle-fed nurslings. It was observed also that nurslings are incapable of storing vitamin C and that young children have this capacity to a limited extent. All of the children who were examined had more or less pronounced

C hypovitaminosis. The author concludes that, to prevent such conditions, care must be taken that either the food contains enough natural vitamin C or that synthetic vitamin C is administered.

Klinische Wochenschrift, Berlin

18: 73-112 (Jan. 21) 1939. Partial Index

- New Orally Active Preparation of Corpus Luteum Hormone. W. Hohlweg and H. H. Inhoffen.—p. 77.
Ascorbic Acid, a Preliminary Stage of Vitamin C. H. Lund, E. Trier, M. Ottsen and A. Elmby.—p. 79.
*Disintegration of Glycogen During Starvation and During Poisoning with Phlorhizin, Curable by Insulin-Dextrose. C. Brentano.—p. 82.
Practicability of Rapid Method of Gander and Niederberger for Determination of Deficit of Saturation with Vitamin C. H. Burmeister and K. Wachholder.—p. 85.
Two Procedures for Determination of Changes in Serum Protein. K. Dirr.—p. 91.
*Cause of Elimination of Vitamin A in Urine. W. Thiele and K. Nemitz.—p. 95.
Hemorrhagic Diathesis in Gastric Carcinoma. O. Schildknecht.—p. 97.

Disintegration of Glycogen.—Brentano describes studies on rabbits which he carried out to determine the capacity for glycogen formation in the musculature and liver during creatinuria. In one group of animals creatinuria was induced by starvation lasting three or four days; in another group creatinuria was induced by poisoning with phlorhizin. Then the animals were given a 50 per cent solution of dextrose in a quantity that provided 10 Gm. of dextrose for each kilogram of body weight; the whole quantity was given in two equal portions rather than at once. In the second experiment the same procedure was employed except that insulin was given in addition to the dextrose. Summarizing his observations in the course of these experiments the author says that hunger and poisoning with phlorhizin produce disintegration of glycogen. Two important manifestations of this metabolic disorder are creatinuria and the impairment of the capacity to form glycogen from administered dextrose in the skeletal musculature. Insulin counteracts the creatinuria that develops during starvation and during poisoning with phlorhizin and at the same time restores the capacity of the muscle to form glycogen. Thus the disintegration of glycogen which takes place during starvation or during poisoning with phlorhizin is curable by insulin. The quantity of glycogen which is stored in the liver is reduced by the insulin because insulin apparently increases greatly the sugar requirement of the muscle. Consequently there remains less sugar for glycogen formation in the liver than is the case when sugar alone, without insulin, is administered.

Elimination of Vitamin A in Urine.—Having gained the impression that the reticulo-endothelial system is important for the storage of vitamin A and its impairment for the urinary elimination of vitamin A, Thiele and Nemitz investigated the appearance of vitamin A in the urine during diseases and during therapeutic measures in which an impairment of the reticulo-endothelial system is to be expected. They examined the urines of syphilitic patients undergoing malaria therapy and of syphilitic patients who were treated with bismuth compounds. They found that vitamin A appears in the urine during malaria as well as during the administration of bismuth compounds. Thus the assumption of a causal significance of the reticulo-endothelial system for the urinary elimination of vitamin A seems to be supported by their observations. They suggest that it might be possible to utilize the urinary elimination of vitamin A in the estimation of the function of the reticulo-endothelial system.

Medizinische Klinik, Berlin

35: 169-200 (Feb. 10) 1939. Partial Index

- Sweating Cures in Internal Diseases. E. Kestermann.—p. 169.
Circulatory Weakness in Acute Infectious Diseases and Their Treatment. G. Joachim.—p. 171.
Endocrine Therapy in Hypertrophy of Prostate. Nestmann.—p. 178.
Tuberculosis of Mesenteric Glands and Tuberculous Peritonitis. Frey.—p. 180.
Symptomatology and Treatment of Allergoses. E. Bumm.—p. 182.
*Change of Specific Hypersensitivity in Hay Fever. W. Schmidt.—p. 183.

Change of Specific Hypersensitivity in Hay Fever.—Schmidt first cites reports from the literature which indicate that a change may take place in the specific hypersensitivity in patients with allergic disturbances. For instance, in persons who have changed their occupation on account of hypersensitivity to a certain substance it has been observed that,

whereas the sensitivity to the substance that was the offensive agent originally has greatly subsided or entirely disappeared, a new hypersensitivity has developed to a substance with which they come in contact in their new occupation. To be sure, a period of several years generally elapses between this change in hypersensitivity. However, since such cases are rare it is generally accepted in everyday practice that allergy tests need not be repeated. In hay fever particularly it is generally accepted that the same pollen is responsible for the annually recurring attacks. The author too accepted this opinion and repeated desensitization treatments with the same allergens every year. However, some of his patients (seven in all) he tested anew for sensitivity to different pollen extracts. The results were so surprising that in spite of the small number of cases he feels justified in reporting them. On the basis of his results he differentiates four groups of patients. To the first group belong those in whom, although the specific desensitization had succeeded, a new sensitization had developed to types of pollen which formerly had given negative results. In the second group the specific desensitization was accomplished only partially. Sensitivity toward other types of pollens, which originally had produced only slight or negative reactions, had either been added to the original sensitivity or had replaced it. In the third group the attempted desensitization had failed and the sensitivity now included types of pollen which formerly had exerted no specific influence on the organism. In the fourth group the specific desensitization failed and the sensitivity toward the pathogenic types of pollens had further increased but no change had taken place in the allergen. Observations on one patient, who had received no treatment, indicated that the allergens may change spontaneously. Evaluating the practical significance of these observations, the author says that in cases of hay fever in which desensitization is not effective new tests should be made in order to detect hitherto unobserved allergens. Moreover, the annual desensitization treatment should always be preceded by new allergy tests.

Zeitschrift für klinische Medizin, Berlin

135: 363-650 (Jan. 20) 1939. Partial Index

- Action of Vitamins on Morphology of Blood. A. H. Müller.—p. 363.
Nature and Significance of Thoracic Leads and Their Relation to Electrical Axis of Different Electrocardiographic Deflections. L. von Unghváry.—p. 388.
Laurence-Moon-Biedl Syndrome. W. Menzel.—p. 423.
Lactic Acid and Circulatory Insufficiency. A. Gambigliani-Zoccoli, R. Giaccherio, E. Zambelli and C. Reschia.—p. 457.
How Electrocardiographic Changes May Be Elicited from Hiatus Oesophageus. H. Kalk and K. Koelsch.—p. 537.
Differentiation of Dyskinesias of Biliary Tract. W. Schöndube.—p. 542.
Active Internistic Therapy of Acute Pancreatitis. G. Katsch.—p. 554.
*Roentgenologic Examination of Liver: Gas in Bile Passages and a New Procedure of Hepatolienography. H. H. Berg.—p. 562.
Recognition of Atypical Cases of Pernicious Anemia by Sternal Puncture. S. Thaddea and D. Bakalos.—p. 629.

Roentgenologic Examination of Liver.—Berg points out that signs of accumulation of gas in the hepatic region, particularly in the bile passages, are often detected when in the course of the roentgenologic examination of the region of the gall-bladder attention is given also to the liver. He says that gas in the liver is caused by the following changes: (1) internal biliary fistulas, (2) insufficiency (gaping) of the duodenal papilla, for instance after the passage of calculi, and (3) infections of the biliary passages (cholangitis with and without abscess formation) with gas-forming micro-organisms. The author maintains that the conditions mentioned under points 1 and 3 are more frequent than has been assumed heretofore but that it is necessary to search for them. He thinks that roentgenoscopy of the liver is especially advisable in obscure hepatobiliary disorders, for instance if chronic indigestion appears after colics due to calculi, if cholangitis is followed by chills or if postoperative biliary disturbances develop. The symptom of gas in the biliary passages is of special importance in the differential diagnosis of acute abdominal symptoms, because it makes possible the early diagnosis of biliary perforation into the gastrointestinal tract. Following further discussion of these problems, the author emphasizes that roentgenologic examination of the liver, without any contrast medium whatever, may be of great value in some clinical conditions, because the symptom "gas in the bile passages" may prove to be of great diagnostic and therapeutic

value. In the second part of his paper, Berg discusses a new method of hepatolienography. He says that thorium dioxide sol has been largely abandoned as a contrast medium because it is not readily eliminated and may cause hepatic impairment. However, hepatolienography has regained its importance since a new, less harmful contrast medium has been discovered. The author describes how the new contrast medium was discovered and developed and how it is employed. The medium is an iodine sol. It is administered slowly by intravenous injection and in quantities that are computed on the basis of the body weight. Roentgenograms are made fifteen, forty-five and seventy-five minutes after the injection. At the end of twenty-four hours the contrast shadow has usually disappeared. The contrast medium is eliminated mostly in the urine in the form of an organic salt, only a small portion of it appearing in the feces. Since the iodine content of the medium may cause complications, the patient must first be tested for hypersensitivity to iodine. In about one third of the cases slight increases in temperature are observed (about 1 degree C.). Fever, chills, cyanosis or decrease in blood pressure are only rarely observed. Control examinations of patients who received injections of this contrast medium one year ago disclosed no signs of late impairment. The author thinks that some of the secondary effects of the contrast medium must be ascribed to the serious disorders (cancer, hepatic abscess, hepatic cirrhosis and so on) that exist in the examined patients. He discusses some of the most noteworthy observations that were made in the more than 100 cases that were examined with this new method of hepatolienography.

Vestnik Khirurgii, Leningrad

56: 309-652 (Sept.-Oct.) 1938. Partial Index

- Pathogenesis of Acute Ileus. N. N. Samarin.—p. 317.
Diagnosis of Acute Ileus. Ya. Ya. Dzhanelidze.—p. 333.
Blood Chlorides in Acute Ileus. V. A. Golovinehits.—p. 353.
*Blood Picture in Acute Ileus. P. N. Demidova.—p. 356.
Roentgenologic Examination in Acute Ileus. E. A. Pehelina.—p. 363.
Basic Principles in Treatment of Acute Mechanical Ileus. M. V. Krasnoselskiy.—p. 377.
Continuous Drainage of Stomach with Thin Tube in Acute Ileus. M. G. Kamenehik.—p. 393.
*Acute Ileus During the Years 1928 to 1938 at the Sklifasovsky Hospital. S. S. Yudin.—p. 410.

Blood Picture in Acute Ileus.—Demidova states that the blood picture in 100 cases of incarcerated hernia showed during the first few hours, before the possibility of the development of dehydration, a moderate increase of the erythrocytes and hemoglobin. The author considers this erythrocytosis to be the result of reflex stimulation of the vegetative nervous system and the outflow of red cells from the reserve depots. This was accompanied by a mild leukocytosis with a moderate shift of the neutrophils to the left. She examined the blood picture in 158 cases of acute intestinal obstruction. The blood picture here presented a marked increase in erythrocytes up to 6,000,000 and a correspondingly high hemoglobin, up to 120 per cent, a leukocytosis of from 12,000 to 30,000, a neutrophil shift to the left, hypoeosinophilia and, in a number of cases, monocytosis. A more detailed analysis showed certain differences in different types of obstructions. Obstruction of the sigmoid in twenty-five cases presented a mild erythrocytosis with a mild leukocytosis (from 9,000 to 15,000), with a moderate shift of the neutrophils to the left, a picture resembling that of the early incarcerated hernia and suggesting absence of toxemia. Ileus of the small intestine in twenty-five cases presented a blood picture with a marked increase of the erythrocytes up to 6,000,000, a leukocyte count up to 23,000 and a marked shift to the left of the neutrophils with the appearance in some cases of immature cells and of myelocytes. The leukocytosis in these toxic cases is soon replaced by leukopenia. The author concludes that the blood picture in ileus has a diagnostic value in reflecting the three stages—that of initial pain and irritation of the vegetative nervous system, that of intoxication, dehydration and thickening of the blood and that of intoxication and beginning infection (peritonitis).

Acute Ileus.—Acute ileus occupied, according to Yudin, the fifth place among the acute abdominal infections treated at the Sklifasovsky Emergency Hospital. Thus during the period from 1928 to 1938 there were treated 6,000 cases of acute appendicitis, 3,500 of extra-uterine pregnancies, 1,400 perforations of the gastroduodenal ulceration, 1,500 of incarcerated hernia and 700

of acute intestinal obstruction. While the mortality rate was markedly lowered during this period for the first four forms of acute conditions within the abdomen, that of acute ileus still presented a mortality of 35 per cent as compared with the former figure of 50 per cent. The author emphasizes the diagnostic significance of the diminution of chlorides, while pointing out that its therapeutic value is somewhat limited. The postoperative prognostic value of the chloride curve is quite definite. Cases in which the chlorides continue to fall despite all measures invariably are fatal. If, however, the chlorides increase as the result of intravenous and subcutaneous introduction of salt solution, the chances for recovery in the gravest cases are much improved. All the author's patients received 2,000 cc. of physiologic solution of sodium chloride before the operation and the same amount immediately after. An additional 3 or 4 liters is administered during the first twenty-four hours by means of the intravenous drip. The author advocates blood transfusion of from 600 to 750 cc. before the operation in order to combat shock, and another of similar amount after the operation in order to diminish the postoperative shock and to neutralize toxemia. While opposed to a universal method of anesthesia, he is partial to the spinal method, which, with proper selection of the cases and perfected technic, presents a number of advantages. He was impressed by the superiority of the radical resection of the involved intestine over the more conservative methods.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 265-376 (Jan. 21) 1939. Partial Index

- *Mental Changes in Pernicious Anemia. J. van Baalen and M. M. P. Vroon.—p. 270.
Paratyphoid A (Hepatic Form): Case. A. W. Pot and H. Verhagen.—p. 276.
*Significance of "Peculiar Appendicular Residue" in Roentgenogram. H. E. A. Fermin and G. A. Lindeboom.—p. 283.
Prophylaxis of Traumatic Neuroses. W. G. Sillevius Smitt.—p. 287.

Mental Changes in Pernicious Anemia.—Van Baalen and Vroon show that psychic disturbances may occur when changes take place in the quantity of blood as well as in diseases of the blood. Excessive loss of blood, for instance, may be followed by periods of somnolence, confusion, anxiety and headaches. Giving their attention to the mental changes in the diseases of the blood, the authors show that in polyglobulism, for instance, psychasthenic symptoms, depressive moods or even a syndrome resembling Korsakoff's psychosis may be observed. In polycythaemia rubra nervous symptoms in the form of headaches, dizziness, tinnitus aurium and paresthesias have been noted, but disturbances of a psychotic character have also been observed. Reviewing the literature on mental changes in pernicious anemia, the authors cite several investigators who have made reports about this problem and point out that Roger and Olmer differentiate three stages in the psychic disturbances of pernicious anemia. During the initial stage, mild character changes appear, such as quarrelsomeness, jealousy and peevishness. Sometimes the mental energy decreases. During the second stage there may appear various psychic changes from simple psychic asthenia to a demented condition and even delirious phases with delusions of persecution. The terminal stage is characterized by demented conditions, confusions and hallucinations. Under the influence of modern liver therapy, these disturbances are less frequent. After calling attention to some reports about psychoses in so-called funicular myelitis, the authors report their observations on three patients with pernicious anemia who had symptoms of mental disturbances. The first patient presented paranoid reactions, depressive disturbances, delirious phases and suicidal inclinations. In the two other patients, the changes in the character and in the moods predominated. As the blood picture improved under the influence of liver therapy the psychic disturbances likewise subsided.

Appendicular Residue in Roentgenogram.—Fermin and Lindeboom report that among 100 patients for whom internists had requested roentgenologic examination of the alimentary tract, twenty-seven showed an "isolated" appendicular residue (shadow in the appendix and not in the cecum) after forty-eight hours. None of these patients were later found to have chronic appendicitis. Many of them had symptoms of ulcer. In two of the cases the anamnesis or the examination disclosed signs indicative of chronic appendicitis and the authors think

that these were the only cases in which appendectomy was indicated. Later the authors examined twenty-four persons in whom an x-ray examination of the alimentary tract had not been requested and who were free from abdominal symptoms. They found that four of this group showed an isolated appendicular residue after forty-eight hours. They conclude from these observations that the isolated appendicular residue is of no great value in determining the advisability of an appendectomy. In this regard the phenomenon probably acquires greater importance if it is observed after a longer period; that is, after four days.

Acta Medica Scandinavica, Stockholm

98:141-288 (Jan. 12) 1939

Composition of the Alveolar Air Investigated by Fractional Sampling: Comparative Investigations on Normal Persons and Patients with Bronchial Asthma and Pulmonary Emphysema. E. Roelsen.—p. 141.
Hypert thyroidism and Iodine Treatment. J. Tillgren and N. Sundgren.—p. 172.

*Mastic Test in Acute Anterior Poliomyelitis. K. G. Kaijser.—p. 209.

*Serotherapeutic Studies on Lobar Pneumonia, Especially Treatment with Rabbit Antipneumococcus Serum. N. I. Nissen.—p. 231.

Clinical Aspects and Occurrence of Icterus and of Its Different Forms. W. Kerppola.—p. 262.

Appearance and Frequency of Desquamation in Scarlet Fever. L. G. Sterner.—p. 280.

Mastic Test in Acute Anterior Poliomyelitis.—Kaijser says that little attention has been given to the mastic reaction in acute anterior poliomyelitis. Nevertheless, several observers have shown that a type of mastic reaction can be evolved which is characteristic for poliomyelitis. The mastic test has been employed in experimental poliomyelitis in monkeys as well as for the early diagnosis of poliomyelitis in human subjects. The author himself studied the value of the test first in fourteen cases of acute anterior poliomyelitis accompanied by paralysis. He reports the clinical histories of these cases and the outcome of the mastic reaction. It was found that in certain cases of poliomyelitis in which paralysis exists at the time of the examination of the cerebrospinal fluid there is a typical mastic reaction. In the majority of these cases only a moderate flocculation was observed in the tube that contains the strongest concentration and the maximum of flocculation appeared in the second, third and fourth tubes. In the succeeding tubes it subsided and it usually disappeared completely in the sixth or seventh tube. The average curve of the mastic reaction in these cases is represented by the figures 123321000. Having determined that poliomyelitis with paralysis possesses a typical curve, the author studied the mastic reaction in two other types of disorders, namely in ten cases of acute anterior poliomyelitis without paralysis and in five cases in which poliomyelitis was suspected. In the ten abortive cases of poliomyelitis the curve of the mastic reaction was not as uniform or as characteristic as in the cases of poliomyelitis that were accompanied by paralysis. In the abortive cases the maximum flocculation was usually observed in tubes 2, 3 and 4. In the five cases in which poliomyelitis was only suspected, the mastic reaction was as it is under normal conditions. The impression was gained that in these five cases there existed a disorder other than poliomyelitis.

Serotherapy of Lobar Pneumonia.—Nissen gives an account of the serum treatment of lobar pneumonia in the Sundby Hospital in Copenhagen and presents statistical data on cases treated with or without serum in the municipal hospitals of Copenhagen in the period from October 1935 to May 1938. Until the autumn of 1937 the serum treatment was given almost exclusively with horse serum, but since November of that year rabbit serum has been generally used. It was found that when adequate serum treatment is given within the first four days of illness a case mortality of more than 40 per cent can be lowered to less than 10 per cent; when treatment with large doses of serum is instituted on the fifth and sixth day, the mortality may probably be reduced to less than 20 per cent. Even on the seventh day the treatment ought to be tried in severe cases. Treatment with serum not specific for the type gave a lower mortality than treatment without serum, but a typical reduction of temperature was rare after administration of such serum. The therapeutic efficacy of nonconcentrated rabbit antipneumococcus serum is just as great as that of concentrated horse serum; whether it is superior cannot be decided on the basis of the present material. The failure of type specific serum treatment may be due to (1) too late institution of treatment

owing to belated clinical or bacteriologic diagnosis, (2) infection with more than one pneumococcus or mixed infection with other bacteria, (3) insufficient dosage, (4) poor quality of serum, (5) bacteremia, (6) preexisting complications, especially cardiac and pulmonary lesions, pregnancy, cirrhosis of the liver, and syphilis and (7) pneumonic complications in the lungs, heart, meninges and peritoneum. Finally, cases will occur in which the infection is so violent from the start that all specific therapy is ineffective. Serum shock was seen in only 5 to 7 per cent of the cases, collapse after one of 222 primary serum injections. Serum shock was not more frequent or more severe, but rather less frequent, after the nonconcentrated rabbit serum preparations than after concentrated horse serum. Serum sickness was far less frequent after the use of concentrated horse serum than after nonconcentrated rabbit serum, occurring respectively in 21 per cent and 47 per cent of the patients, and it was more severe in the patients treated with rabbit serum. Most likely, concentration of the rabbit serum will lower the incidence and intensity of serum sickness. Purulent lung complications were not more frequent in patients treated with serum than in those treated without serum, rather less frequent. The absolute numbers are bound to be somewhat uncertain, because necropsy was not permitted in many of the fatal cases.

Finska Läkaresällskapetets Handlingar, Helsingfors

81:503-606 (June) 1938

*Observations on Action of Aminopyrine on Living Neutrophil Granulocytes in Normal Persons and in Persons Hypersensitive to Aminopyrine. I. Wallgren.—p. 560.

Approximate Determination of Fat Content in Feces. R. Ehrström.—p. 577.

Blood Picture in Intracutaneous Vaccination. Birgitta Knappe.—p. 579.

Action of Aminopyrine on Granulocytes.—Examining neutrophil granulocytes in a milieu with successively increased aminopyrine content, Wallgren established a threshold at which most of the cells still performed their ameboid movements and a higher threshold at which most of the cells no longer moved. In cells from normal persons the upper threshold was at an aminopyrine concentration of from 0.2 to 0.24 per cent in cells from two persons hypersensitive to aminopyrine at a concentration of 0.14 and 0.18 per cent respectively. He says that in hypersensitive persons, after the intake of aminopyrine, there is in addition to other symptoms a decrease in the number of neutrophil granulocytes in the peripheral blood. Since the neutrophil granulocytes in vitro withstand an aminopyrine content many times higher than that which appears in the blood plasma after the usual therapeutic dose of aminopyrine, it is not likely that this dose causes a disturbance of the cells in the circulating blood. The occurrence of neutrophil granulocytes in the circulating blood is variable. Leukopenia may occur in the peripheral blood simultaneously with a leukocytosis in the internal organs, and vice versa. In conditions of shock there may be a sudden transport of neutrophil granulocytes from the skin to the internal blood vessels. It does not seem unlikely that the sudden leukopenia which appears in hypersensitive persons after aminopyrine medication takes place in the same way. This presupposes an abnormal sensitivity in the mechanism which regulates the apportionment of the neutrophil granulocytes in the blood vessel system. The fact that the cells from persons hypersensitive to aminopyrine cease their ameboid movements at a lower threshold than do the cells from the control cases may be the expression of such a hypersensitivity in the apportionment mechanism of the neutrophil granulocytes.

81:607-698 (July) 1938

*Iron Content in Liver in Pernicious Anemia After Some Improvement Following Short Treatment with Liver. C. A. Hernberg.—p. 647.
Two Cases of Unilateral, Partial Aplasia of Adnexa. N. Riska.—p. 651.
Some Cases of Tetany Treated with Dihydrochysterol. S. Söderlund.—p. 659.

Iron Content of Liver in Pernicious Anemia.—Hernberg states that in a woman aged 60, who died from bronchopneumonia on the tenth day after the start of energetic liver treatment, the hemoglobin content had risen from 23 to 36 per cent, the number of red blood corpuscles had risen from 824,000 to 1,640,000, and the color index had dropped from 1.64 to 1.1. The liver showed a definite siderosis. The total iron in the liver was 637.5 mg., more than six times as much as that previously found by the author in two cases of pernicious anemia in full remission.

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MODERN METHODS OF TREATMENT OF DISEASES OF THE NERVOUS SYSTEM

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It has not been many years since neurology was widely considered a purely diagnostic specialty—a *meditatio morbis*. One can look through the pages devoted to nervous diseases in almost any textbook of medicine written before the war and find scarcely a single suggestion of treatment beyond arsenic, strychnine, bromides and electricity, aside from the more obvious indications for surgery.

Yet there are specific and effective forms of treatment for neurologic diseases, and their number has shown an astonishing growth during recent years. Since so few of them have found their way into the common body of medicine, I have thought it might be of interest to review them. In assembling such a summary, I find that as a matter of fact there is so much ground to cover that certain important territories will have to be omitted entirely.

Three large and significant fields about which I shall say little are surgical. They are the territories of the treatment of injuries of the nervous system, of the surgery of tumors and of operations on the sympathetic system. Any brief summary would fail to do them justice; moreover, the story of their successes has often been brought before the medical public, and recent authoritative books are available on each.¹

I shall leave psychiatry and psychotherapy entirely out of account as being outside my own sphere of competence. In passing, however, I should like to pay tribute to the rising standard of psychologic understanding and interest among practitioners and students of today. Though startling innovations have been rare, there is far less quarreling over doctrinal differences and far more devotion to an unprejudiced appraisal of the patient's needs of various kinds than was the case twenty years ago.²

In addition to these intentional omissions there are, I am sure, unintentional ones. This list of methods of treatment makes no pretensions to completeness. It

consists of those which seem thoroughly established or with which I have had personal successful experience. An attempt has been made to give credit only for broad innovations, but I am quite aware that the story might have been written with an entirely different set of heroes. It is the theme that I particularly wish to bring to attention.

THE TREATMENT OF PAIN

To return to more strictly neurologic subjects: It is perhaps natural that pain should be the symptom of disease of nerve tissue which earliest demanded and first received specific relief. The use of opium dates back to prehistoric days and no real substitute for it has ever been found. According to Létievant³ the first recorded nerve section for neuralgia was performed by Maréchal, the court surgeon of Louis XIV. I have not been able to find any particulars. Létievant himself, writing in 1872, was familiar with section of branches of the trigeminal, the intercostals, the occipitals and the sciatic nerves. Peripheral neurectomies have, however, largely fallen out of use except in the treatment of supra-orbital neuralgia, of thrombo-angiitis obliterans⁴ and of tuberculosis of the larynx.

A more refined procedure is intraspinal section of spinal posterior roots, first suggested by Charles Dana and carried out by Robert Abbe⁵ of New York in 1888. This obviously has the advantage that motor power is preserved. It paved the way for that triumph of surgery, the radical cure of trigeminal neuralgia. Rose⁶ was the pioneer in removal of the gasserian ganglion, but his approach has been abandoned. Horsley⁷ cut the posterior root by a method resembling the modern one in 1891 but his patient died. Successful results from a practical procedure were announced by Krause⁸ in 1893.

A bold step forward in neurologic treatment was suggested by Schüller in 1910⁹ and carried out by Spiller and Martin¹⁰ in 1911, the section of the pathways for pain in the spinal cord. Aside from the prac-

3. Létievant, J. J. E.: *Traité des sections nerveuses*, Paris, J. B. Baillière et fils, 1873.

4. Smithwick, R. H., and White, J. C.: *Peripheral Nerve Block in Obliterative Vascular Disease of the Lower Extremity*, Surg., Gynec. & Obst. 60: 1106-1114 (June) 1935.

5. Abbe, Robert: *A Contribution to Surgery of the Spine*, M. Rec. 33: 149-152, 1889.

6. Rose, W.: *Removal of the Gasserian Ganglion for Severe Neuralgia*, read before the Medical Society of London, Oct. 27, 1890.

7. Horsley, Victor; Taylor, J., and Coleman, W. S.: *Remarks on the Various Surgical Procedures Devised for the Cure of Trigeminal Neuralgia*, Brit. M. J. 2: 1139 (Nov. 28), 1191 (Dec. 5), 1249 (Dec. 12) 1891.

8. Krause, Fedor: *Entfernung des Ganglions Gasseri und des central davon gelegenen Trigeminalganglions*, Deutsche med. Wchnschr. 19: 341, 1893.

9. Schüller, Arthur: *Ueber operative Durchtrennung des Rückenmarkstränge (Chordotomie)*, Wien. med. Wchnschr. 40: 2292-2296, 1910.

10. Spiller, W. G., and Martin, Edward: *The Treatment of Persistent Pain of Organic Origin in the Lower Part of the Body by Division of the Anterolateral Column of the Spinal Cord*, J. A. M. A. 58: 1489 (May 18) 1912.

Read before the American College of Physicians, Atlantic City, N. J., in May 1938.

From the Neurological Unit, Boston City Hospital, and the Department of Neurology, Harvard Medical School.

1. (a) Munro, Donald: *Treatment of Head Injuries*, Oxford Medical Publications, to be published. (b) Cushing, Harvey: *Intracranial Tumors*, Baltimore, Charles C. Thomas, Publisher, 1932. (c) White, J. C.: *The Autonomic Nervous System*, New York, Macmillan Company, 1935.

2. Ross, T. A.: *An Enquiry into Prognosis in the Neuroses*, London, Cambridge University Press, 1936.

tical value of the operation, which has now become a common and standard one, this step opened what promises to be an important epoch in neurology, that of operative intervention on structures of the central nervous system for the purpose of altering its physiology.

Except for operations on the sympathetic nervous system, which will be mentioned briefly later, the only new procedure for the relief of pain which has found wide acceptance is that introduced by Dogliotti¹¹ in 1931, namely the subarachnoid injection of absolute alcohol. The method was first used in this country at the Neurological Unit, as far as I am aware, and the staff has convinced itself that the method has definite though restricted value. It is a conservative method of treating mild chronic pain; for severer conditions chordotomy saves time, pain, uncertainty and the patient's motor power. A field of usefulness for the procedure of Dogliotti which deserves further study is in the treatment of certain forms of spasticity.

SURGICAL TREATMENT OF TUMORS OF THE NERVOUS SYSTEM

The first successful operation for tumor of the brain (by Godlee) was recorded in 1884.¹² A tumor of the spinal cord was removed in 1888 by Horsley.¹³ Annandale¹⁴ reported recovery after operation on an acoustic neuroma in 1893. Successful radiotherapy of a pituitary adenoma was reported by Bécclère¹⁵ in 1901. Nordentoft¹⁶ announced successful treatment of gliomas in 1917. From these hesitating beginnings the surgery of tumors of the brain and spinal cord has made enormous strides, perhaps most strikingly signalized by Cushing's¹ review of his 2,000 verified tumors in 1932. I shall make no attempt to trace the steps of the progress, but I should like to point out that it was due largely to the successes of tumor surgery that hopes of successful forms of treatment in other departments of neurology were aroused.

THE TREATMENT OF CONVULSIONS

Epilepsy was recognized as a disease and treated in prehistoric times. While scattered "cures" have followed the use of any one of a thousand different remedies, only a few measures have come to be accepted in modern practice. One of these is the use of bromides. This was apparently first recommended by Sir Charles Locock¹⁷ in 1857 in the course of a discussion of a paper by Sieveling. Locock's reasoning was simple: An unnamed German had tried potassium bromide on himself and found it an anaphrodisiac; it was well known that many cases of epilepsy were caused by onanism; he tried it in fourteen cases and it worked in all but one. It is still recognized as a moderately successful anticonvulsant.

11. Dogliotti, A. M. Traitement des syndromes douloureux de la périphérie par l'alcoolisation subarachnoïdienne des racines postérieures à leur émergence de la moelle épinière, *Presse méd* 39: 1249 (Aug. 22) 1931.

12. Bennett, H., and Godlee, R. Excision of a Tumour of the Brain, *Lancet* 2: 1090 1091, 1884.

13. Gowers, W. R., and Horsley, Victor. A Case of Tumor of the Spinal Cord; Removal; Recovery, *M. Chir. Tr. (London)* 71: 377-430, 1887-1888.

14. Annandale, Thomas. On Intracranial Surgery, Edinburgh M. J. 39: 898-910, 1893.

15. Bécclère, A. The Radiotherapeutic Treatment of Tumors of the Hypophysis, Gigantism and Acromegaly, *Arch. Roentg. Ray, London* 14: 142, 1909.

16. Nordentoft, S. The Treatment of Tumors of the Brain by X-Rays, *Ugeskr. f. Læger* 79: 775 (May 17) 1917.

17. Locock, Charles, in discussion on paper by Sieveling, E. H., *Lancet* 1: 528, 1857.

A rational operative treatment for focal epilepsy was reported by Horsley¹⁸ in 1887, namely excision of an irritable focus of the cortex. The procedure could scarcely be termed an accepted one until after the careful studies of Foerster and Penfield.¹⁹ It appears probable that the more precise information which can now be obtained by electro-encephalography will be of particular value in selecting cases for this treatment.²⁰

On the whole, the most successful treatment for the majority of patients suffering from convulsions of unknown origin is the use of phenobarbital, which was recommended for this purpose by Hauptmann²¹ in 1912. It is applicable to a far larger proportion of cases than is surgery, and it has a greater anticonvulsant effect in proportion to its soporific effect than bromides or than any of the other barbiturates.

The treatment of epilepsy by ketosis was reported by Wilder²² in 1921. It is a measure which still finds employment in some cases, particularly for petit mal in children.

The drugs at present in use for the treatment of convulsions were all primarily introduced as hypnotics, and the discovery of their anticonvulsant effect has been rather accidental. A systematic search for anticonvulsants by an experimental method was begun at the Neurological Unit in 1937²³ and is still being continued. It has already yielded one compound, diphenylhydantoin, which appears to be more effective than phenobarbital and without appreciable soporific effect. The study of convulsions by means of electro-encephalography²⁰ suggests that there are several types, each due to a distinct physiologic mechanism, and possibly each will require individual study and treatment.

TREATMENT OF NEUROSYPHILIS

The recognition of syphilis of the nervous system is a relatively modern feat. It was doubtless treated with mercury even before it was recognized. According to Garrison,²⁴ the identity of the man who first introduced mercury into therapeutics is unknown. It is probable that, as far as neurosyphilis at least is concerned, its reign is almost over.

The story of the introduction of arsphenamine by Ehrlich²⁵ in 1910 is familiar to all. It is unique in history—a new conception systematically and patiently pursued by a great genius over many years, and finally a magnificent success—to be compared only with vaccination in its significance to the human race. As a treatment for parenchymatous neurosyphilis it has largely been replaced by a modification—tryparsamide,

18. Horsley, Victor. Remarks on Ten Consecutive Cases of Operation upon the Brain and Cranial Cavity to Illustrate the Details and Safety of the Method Employed, *Brit. M. J.* 1: 863, 1887.

19. Foerster, O., and Penfield, W.: Die Narbenzug am und im Gehirn bei traumatischer Epilepsie in seiner Bedeutung für das Zustandekommen der Anfälle und für die therapeutische Bekämpfung derselben, *Ztschr. f. d. ges. Neurol. u. Psychiat.* 125: 475 (June 16) 1930.

20. Gibbs, F. A.; Gibbs, E. L., and Lennox, W. G. Epilepsy. A Paroxysmal Cerebral Dysrhythmia, *Brain* 60: 377-388 (Dec.) 1937.

21. Hauptmann, A. Luminal bei Epilepsie, *München med. Wchnschr.* 59: 1907, 1912.

22. Wilder, R. M. The Effects of Ketonuria on the Course of Epilepsy, *Bull. Mayo Clin.* 2: 307, 1921.

23. Putnam, T. J., and Merritt, H. H. Experimental Determination of the Anticonvulsant Properties of Some Phenyl Derivatives, *Science* 85: 525 (May 28) 1937. Merritt, H. H.; Putnam, T. J., and Schwab, Dorothy M.: A New Series of Anticonvulsant Drugs Tested by Experiments on Animals, *Arch. Neurol. & Psychiat.* 39: 1003-1015 (May) 1938.

24. Garrison, F. H. An Introduction to the History of Medicine, ed. 2, Philadelphia, W. B. Saunders Company, 1917, p. 175.

25. Ehrlich, Paul, and Hata, Sahachiro. Die experimentelle Chemotherapie der Spirillosen (Syphilis, Framboesie, etc.) Berlin, Julius Springer, 1910.

prepared by Jacobs and Heidelberger²⁰ of the Rockefeller Institute in 1917. The use of fever in the treatment of neurosyphilis has a long history in the life of one man. Wagner von Jauregg²⁸ apparently first noticed its effect in dementia paralytica in 1887 but he dropped the subject and returned to it only during the war. His first brief paper specifically recommending the use of malaria was published in 1918.²⁹ Since then the method has become a standard one.

A few years later the use of bismuth was proposed by Sazerac and Levaditi.³⁰ The salts of this metal have largely taken the place of those of mercury.

At the turn of the century there was no known method of treatment of syphilis that would prevent infection of the nervous system. Up to the close of the war, once neurosyphilis was established, there was little hope of arresting its course. At present the majority of early cases can be cured.

THE TREATMENT OF OTHER INFECTIONS

Among infections of the nervous system, abscess of the brain presents a problem of which the solution is obvious but difficult to attain. Successful operation on an abscess was reported by Morand³¹ in 1768. The principles governing operative treatment are gaining slow recognition and there has been a gradual decline in the average operative mortality.

The next progress in controlling infections came with the rapid growth of bacteriology and immunology in the last quarter of the last century. The Pasteur prophylaxis against rabies³² in 1885 and the antitoxin against tetanus developed by von Behring³³ in 1892 are now so successful that one can scarcely reconstruct for oneself the days when those terrible diseases were common.

Meningitis, next to syphilis the most common form of infection of the nervous system, still retains a high rate of mortality. The value of lumbar puncture in its treatment³⁴ is not yet fully recognized. A specific antiserum against infections with the meningococcus was introduced by Jochmann³⁵ in 1906. Although widely used, its value is still in some doubt. In the last two years, synthetic drugs of the type of sulfanilamide³⁶ have become a standard treatment, which is amazingly effective not only against infections by the meningococcus but against other pyogenic infections.

There is no accepted treatment for, or prophylaxis against, poliomyelitis, encephalitis and herpes. It has been shown that many types of "encephalitis" are in reality not infections of the brain.³⁷ Severe chorea of

the Sydenham type, and also that occurring in pregnancy, may be effectively treated by induced fever.³⁸ The severe neuralgia that sometimes follows herpes usually yields to roentgen treatment.³⁹

TREATMENT OF DEFICIENCY DISEASES

An increasing number of diseases of the nervous system are now being recognized as due to vitamin deficiency. The first of these was pellagra,⁴⁰ the treatment of which has now been placed on a sound basis.⁴¹ Modern vitaminology may be said to have begun with Eijkman's⁴² experiments on beriberi. He would have been surprised, perhaps, to see most polyneuritides regarded as subvarieties of beriberi,⁴³ including the type described by Landry.⁴⁴

Owing to the recognition that combined systemic disease of the spinal cord is related to pernicious anemia, it is obvious that Minot and Murphy's discovery of the liver diet for the treatment of the latter should be applied to the former also. There have been disappointing results with liver treatment in some hands, but convincing evidence has been offered that arrest of progress of degeneration of the cord is the rule, and improvement is common if large enough doses are used—far larger than are needed to control the blood picture.⁴⁵

Not only "alcoholic" polyneuritis⁴⁶ but also the characteristic confabulatory psychosis often associated with it appears to be due in part to a vitamin deficiency.⁴⁷ It is likely that the same is true of Wernicke's alcoholic poliencephalitis.⁴⁸ How effective treatment of these conditions will be remains to be seen.

TREATMENT OF DISEASES OF THE SYMPATHETIC SYSTEM

Surgery of the sympathetic nervous system had its beginnings in the last century, but its real successes have come only since the war. It is of definite value in the treatment of Raynaud's disease⁴⁹ and of Hirschsprung's disease.⁵⁰

There have been many disappointments in the treatment of angina pectoris, but alcohol injection of the intercostal nerves as carried out by Mandl⁵¹ appears to be a reliable method of cure of the pain. Certain obscure painful conditions of the extremities are some-

26 Jacobs, W. A., and Heidelberger, M. Aromatic Arsenic Compounds, *J. Am. Chem. Soc.* **41**: 1581, 1917. Brown, W. H., and Pearce, Louise. The Toxic Action of *n*-Phenyl Glycine Amide p Arsonic Acid, *J. Exper. Med.* **30**: 417 (Nov.) 1919.

27 Footnote deleted on proof.

28 Wagner, von Jauregg, Julius. Ueber die Einwirkung fieberhaften Erkrankungs auf Psychosen, *Jahrb. f. Psychiat.* **7**: 94 131, 1887.

29 Wagner von Jauregg, Julius. Ueber die Einwirkung der Malaria auf die progressive Paralyse, *Psychiat. neurol. Wehnschr.* **20**: 21, 22: 39, 40, 1918.

30 Sazerac, R., and Levaditi, C. Le bismuth dans la syphilis, *Compt. rend. Soc. de biol.* **85**: 482, 1921.

31 Morand, S. F. Opuscules de chirurgie, Paris, 1768.

32 Pasteur, Louis. Methode pour prevenir la rage apres morsure, *Compt. rend. Acad. d. sc.* **101**: 765, 1885.

33 von Behring and Kitasato. Ueber die Zustandekommen der Diphtherieimmunität und der Tetanusimmunität bei Tieren, *Deutsche med. Wehnschr.* **16**: 1113, 1145, 1890.

34 Quincke, H. Die Lumbalpunktion des Hydrocephalus, *Berl. klin. Wehnschr.* **28**: 929, 965, 1891.

35 Jochmann, G.: Versuch zur Serodiagnostik und Serotherapie der epidemischen Genickstarre, *Deutsche med. Wehnschr.* **1**: 788, 1906.

36 Domagk, Gerhard. Ein Beitrag zur Chemotherapie der bakteriellen Infektionen, *Deutsche med. Wehnschr.* **61**: 250-253 (Feb. 15) 1935.

37 Putnam, T. J. Lesions of "Encephalomyelitis" and Multiple Sclerosis: Venous Thrombosis as the Primary Alteration, *J. A. M. A.* **108**: 1477-1480 (May 1) 1937.

38 von Kern, T. Die Behandlung der Chorea minor mittels Milchinjektionen, *Wien. klin. Wehnschr.* **37**: 164-165 (March 1) 1923.

39 Hadengue, P. Deux cas de zona traites par la radiotherapie, *Bull. et mem. Soc. de radiol. med. de France* **13**: 212-214, 1925.

40 Lussana and Frua. Sulla pellagra, Milan, 1886.

41 Spies, T. D.: The Treatment of Pellagra, *J. A. M. A.* **101**: 1377 (April 20) 1935. Elvehjem, C. A.; Madden, R. J.; Strong, F. M., and Wooley, D. W.: Relation of Nicotinic Acid and Nicotinic Acid Amide to Canine Blacktongue, *J. Am. Chem. Soc.* **59**: 1767, 1937.

42 Eijkman, Christiaan. Ein Versuch zur Bekämpfung Beri beri, *Virehows Arch. f. path. Anat.* **149**: 187, 1897.

43 Shattuck, G. C.: Relation of Beriberi to Polyneuritis from Other Causes, *Am. J. Trop. Med.* **8**: 539-543 (Nov.) 1928.

44 Brown, M. A. Note on the Etiology of So Called Landry's Ascending Paralysis, *Arch. Neurol. & Psychiat.*, to be published.

45 Strauss, Maurice; Solomon, Philip; Schneider, A. J., and Patek, A. J., Jr.: Subacute Combined Degeneration of the Spinal Cord, the Complete Arrest of the Lesions with Parenteral Liver Therapy, *J. A. M. A.* **104**: 1587-1592 (May 4) 1935.

46 Minot, George; Strauss, Maurice, and Cobb, Stanley: "Alcoholic" Polyneuritis, Dietary Deficiency as a Factor in Its Production, *New England J. Med.* **208**: 1244-1249 (June 15) 1933.

47 Alexander, Leo, Pijoan, Michel, Schube, P. C., and Moore, Merrill: Ascorbic Acid Content of Blood Plasma in Alcoholic Psychoses, *Arch. Neurol. & Psychiat.* **40**: 58 (July) 1938.

48 Alexander, L.; Myerson, A., and Pijoan, M. Beriberi and Scurvy—An Experimental Study, *Tr. Am. Neurol. A.* **64**: 135-138, 1938.

49 Royle, N. D.: The Surgical Treatment of Raynaud's Disease and Similar Conditions, *M. J. Australia* (supp. 11), Nov. 5, 1927, pp. 341-343.

50 Wade, R. B., and Royle, N. D.: The Operative Treatment of Hirschsprung's Disease: A New Method, *M. J. Australia* **1**: 137-141 (Jan. 29) 1927.

51 Mandl, F.: Weitere Erfahrungen mit der paravertebralen Injektion bei der Angina pectoris, *Wien. klin. Wehnschr.* **38**: 759 (July 2) 1925.

times benefited by sympathectomy.⁵² Further information should be sought in one of the recent treatises on the subject.^{1c}

A recent accession to the list of conditions amenable to surgery is the carotid sinus syndrome. The clinical importance of the condition has been pointed out by Weiss⁵³ and the possibility of its surgical relief has been demonstrated at the Boston City Hospital.

Whether or not migraine should be included among surgical diseases is open to question. Cervical sympathectomy,⁵⁴ injection of alcohol into the gasserian ganglion,⁵⁵ section of the temporal artery and of the meningeal artery⁵⁶ have all been followed by success in some instances and failure in others. A remarkable medical treatment for individual attacks of migraine is the use of ergotamine tartrate.⁵⁷

THE TREATMENT OF PARALYSIS AGITANS AND ATHETOSIS

One of the most familiar diseases of the nervous system is paralysis agitans. The only accepted treatment for this often distressing condition is the use of drugs of the atropine series, apparently first suggested by Charcot.⁵⁸ Enormous doses are sometimes tolerated but are often ineffective. Recently the use of a fresh hot decoction in white wine has found wide and apparently successful use in Italy. Some of my patients have told me that moderate doses of alcohol, alone or with scopolamine, are valuable. The asthenia that often accompanies the disease may sometimes be relieved in the postencephalitic types of paralysis agitans by administration of amphetamine (benzedrine) sulfate,⁵⁹ which is also a fairly reliable remedy for the oculogyric crises which accompany it.

In extremely severe unilateral cases the resort to surgery may be justified. Bucy⁶⁰ has recently demonstrated that the tremor may be abolished by an extensive resection of the motor cortex—a possibility vaguely foreshadowed by Parkinson himself.⁶¹ At the Neurological Unit a similar result has been obtained by section of the pyramidal tract in the spinal cord, which impairs the function of the corresponding limbs to an astonishingly slight extent.⁶²

The somewhat rarer but often far more distressing condition of athetosis has received less attention than it deserves. The first successful attempt at its relief, excision of the corresponding motor cortex, was

reported in 1909 by Horsley,⁶³ and his method has been further developed by Bucy and his associates.⁶⁴ The method first used at the Neurological Unit in 1931 accomplishes the same object by section of the extrapyramidal tracts in the spinal cord.⁶⁵ It can be used in bilateral cases (best in two stages) and does not destroy the use of the extremities.

A promising start in the medical treatment of athetosis has been made by West.⁶⁶ He has shown that the intravenous administration of curare will depress abnormal movements for several days, and this has been confirmed by Burman⁶⁷ and at the Neurological Unit. Obviously, the method is not suitable for general use at present, but a search for more practical drugs is under way.

The most successful treatment for spasmodic torticollis is the operation devised by Dandy:⁶⁸ section of the first four cervical roots and the spinal accessories.

THE TREATMENT OF HYDROCEPHALUS

The importance of hydrocephalus as a disease has been underestimated. According to Murphy⁶⁹ it occurs in the proportion of more than one and one-half times in every thousand "white" births; that is, there are probably two or three thousand hydrocephalic infants born every year in this country. Most hydrocephalic infants are mentally defective from the outset, and these are doomed in any case. Many of them, however,—perhaps a fourth—are apparently capable of growing up normally if the pressure can be relieved. There have been isolated successes from various types of operations (reviewed by Davidoff⁷⁰), but only recently have technical improvements permitted a series large enough for statistical purposes to be accumulated.⁷¹ In selected cases the operative mortality may be as low as 10 per cent after bipolar coagulation of the choroid plexuses. When hydrocephalus and spina bifida coexist, an alternative method of relief has been successful in a few instances, namely resection of the abnormal mass of tissue which apparently blocks the circulation of fluid.⁷²

TREATMENT OF SYRINGOMYELIA

Syringomyelia is a hereditary malformation which often exists without giving rise to symptoms. About 60 per cent of cases are improved by persistent treatment with x-rays.⁷³ In cases resistant to irradiation

52 Jaboulay, Mathieu: *Arthralgies et neuralgies traitées par des opérations pratiques sur le sympathique*, Lyon med **41**:129 131, 1899

53 Weiss, Soma, and Baker, J. P.: *The Carotid Sinus in Health and Disease: Its Role in the Causation of Fainting and Convulsions*, Medicine **12**:297 (Sept.) 1933

54 Dandy, Walter: *Treatment of Hemiergia (Migraine) by Removal of the Inferior Cervical and the First Thoracic Sympathetic Ganglion*, Bull. Johns Hopkins Hosp **48**:357 (June) 1931

55 Harris, W.: *Ciliary (Migrainous) Neuralgia and Its Treatment*, Brit M. J. **1**:457-460 (March 7) 1936

56 Dickerson, D. G.: *Surgical Relief of the Headache of Migraine*, J. Nerv. & Ment. Dis. **77**:42 (Jan.) 1933

57 Maier, H. W.: *L'ergotamine, inhibiteur du sympathique, étude en clinique, comme moyen d'exploration et comme agent thérapeutique*, Rev. neurol **1**:1104, 1926. Von Storch, T. I. C.: *The Migraine Syndrome: Comments on Its Diagnosis, Etiology and Treatment*, New England J. Med **217**:247 251 (Aug 12) 1937

58 Ordenstein, L.: *Sur la paralysie agitante et la sclérose en plaques généralisée*, Paris, 1868, p. 31

59 Solomon Philip; Mitchell, R. S. and Prinzmetal, Myron: *Use of Benzedrine Sulfate in Postencephalitic Parkinson's Disease*, J. A. M. A. **108**:1765 (May 22) 1937.

60 Bucy, P. C.: Personal communication to the author.

61 Parkinson, James: *Essay on the Shaking Palsy*, reprinted in Arch. Neurol. & Psychiat. **7**:683 710 (June) 1922.

62 Putnam, T. J.: *The Relief of Unilateral Paralysis Agitans by Section of the Pyramidal Tract*, Arch. Neurol. & Psychiat. **40**:1049-1050 (Nov.) 1938

63 Horsley, Victor: *The Function of the So Called Motor Area of the Brain*, Brit. M. J. **2**:125, 1909.

64 Bucy, P. C., and Case, T. J.: *Athetosis. II. Surgical Treatment of Unilateral Athetosis*, Arch. Neurol. & Psychiat. **37**:983 1020 (May) 1937.

65 Putnam, T. J.: *Results of Treatment of Athetosis by Section of Extrapyramidal Tracts in the Spinal Cord*, Arch. Neurol. & Psychiat. **39**:258 272 (Feb.) 1938

66 West, Ranyard: *Pharmacology and Therapeutics of Curare and Its Constituents*, Proc. Roy. Soc. Med. **28**:565 (March) 1935

67 Burman, M.: *The Therapeutic Use of Curare and Erythroidine Hydrochloride in Spastic and Dystonic States*, Arch. Neurol. & Psychiat., to be published

68 Dandy, Walter: *Operation for Treatment of Spasmodic Torticollis*, Arch. Surg. **20**:1021 (June) 1930

69 Murphy, D. P.: *The Etiology of Congenital Malformations in the Light of Biologic Statistics*, Am. J. Obst. & Gynec. **34**:890 (Nov.) 1937.

70 Davidoff, L. M.: *Treatment of Hydrocephalus: Historical Review and Description of a New Method*, Arch. Surg. **18**:1737 1762 (April) 1929

71 Putnam, T. J.: *The Mentality of Infants Relieved by Hydrocephalus by Endoscopic Coagulation of the Choroid Plexus*, Am. J. Dis. Child. **55**:990 999 (May) 1938.

72 Parker, H. L., and McConnell, A. A.: *Internal Hydrocephalus, Resulting from a Peculiar Deformity of the Hindbrain*, Tr. Am. Neurol. A. **63**:14 16, 1937. D'Errico, A. P.: *A Surgical Procedure for Hydrocephalus with Spina Bifida*, read before the Section on Nervous and Mental Diseases of the American Medical Association, June 10, 1937.

73 Raymond, J.: *La syringomyélie, diagnostic; pathogénie*, J. de méd. int. **8**:53-55, 1904. O'Brien, F. W.: *Roentgen Therapy in Syringomyelia*, Radiology **24**:16 21 (Jan.) 1935

and especially those in which there is pain or a sub-arachnoid block, operative drainage of the syrinx may afford some relief. This operation was first recorded by Elsberg⁷⁴ and was applied in a systematic fashion and recommended by Puussepp⁷⁵ of Estonia, where the condition is apparently far more common than in this country.

TREATMENT OF MÉNIÈRE'S SYNDROME

A method of treatment of recurrent attacks of vertigo, by destruction of the labyrinths, was suggested by Lake⁷⁶ in 1904. The operation of section of the auditory nerve was first carried out by Frazier⁷⁷ in 1910. Both types of procedure were long neglected and have only recently come into their rightful places.⁷⁸ In addition to the modern operations, medical treatment, which is often effective, has been proposed by Furstenberg.⁷⁹

NEW MEDICAL REMEDIES FOR MISCELLANEOUS DISEASES

Narcolepsy is a disease which is often overlooked or untreated. The overpowering drowsiness which characterizes it is satisfactorily combated by amphetamine sulfate, for which the patients often have a high tolerance.⁸⁰ Since the introduction of the drug for this purpose it has been widely used in the treatment of asthenia, fatigue and debility of many types⁸¹ perhaps too widely, for it is not a drug for indiscriminate use.

An effective treatment for myasthenia gravis was found by Mary Walker⁸² in 1935, namely prostigmine, a synthetic substitute for physostigmine.⁸³ Myotonia, a disease which is in many ways the opposite of myasthenia (both are apparently disorders of the chemical transmission of the nerve impulse), was relieved by the use of quinine by Kennedy and Wolf⁸⁴ in 1936.

TWO MECHANICAL SUBSTITUTES FOR NERVOUS FUNCTIONS

There are many disease states which produce a temporary cessation of respiration but are not necessarily fatal otherwise. A respirator was designed by Drinker⁸⁵ in 1929 primarily for use in resuscitation from asphyxia and electric shock. It is, however, finding a larger and constantly expanding use in the treatment of poliomyelitis, polyneuritis and injuries to the spinal cord. A respirator should be part of the equipment of every neurologic service.

74. Elsberg, C. A.: *Diseases of the Spinal Cord and Its Membranes*, Philadelphia, W. B. Saunders Company, 1916, p. 170.

75. Puussepp, L.: *Traitement opératoire de la syringomyélie*, *Rev. neurol.* 1: 1171, 1926.

76. Lake, Richard: *Ménière's Disease*, *Lancet* 1: 1056, 1904.

77. Frazier, C. H.: *Intracranial Division of the Auditory Nerve for Persistent Vertigo*, *Surg., Gynec. & Obst.* 15: 524-529, 1912.

78. Dandy, Walter: *Ménière's Disease: Its Diagnosis and Method of Treatment*, *Arch. Surg.* 16: 1127 (June) 1928. Putnam, T. J.: *The Treatment of Recurrent Attacks of Vertigo by Subtemporal Destruction of the Labyrinth*, *Arch. Otolaryng.* 27: 161-168 (Feb.) 1938.

79. Furstenberg, A. C.; Lashmet, F. H., and Lathrop, F.: *Ménière's Symptom Complex: Medical Treatment*, *Ann. Otol., Rhin. & Laryng.* 43: 1035 (Dec.) 1934.

80. Prinzmetal, Myron, and Bloomberg, Wilfred: *The Use of Benzadrine for the Treatment of Narcolepsy*, *J. A. M. A.* 105: 2051-2054 (Dec. 21) 1935.

81. Myerson, Abraham: *Effect of Benzadrine Sulfate on Mood and Fatigue in Normal and in Neurotic Persons*, *Arch. Neurol. & Psychiat.* 36: 816 (Oct.) 1936.

82. Walker, Mary: *Case Showing Effect of Prostigmine on Myasthenia Gravis*, *Proc. Roy. Soc. Med.* 28: 759-761 (April) 1935.

83. Viets, H. R., and Schwab, R. S.: *Prostigmine in the Diagnosis of Myasthenia Gravis*, *New England J. Med.* 213: 1280-1283 (Dec. 26) 1935.

84. Kennedy, Foster, and Wolf, Alexander: *Experiments with Quinine and Prostigmine in Treatment of Myotonia and Myasthenia*, *Arch. Neurol. & Psychiat.* 37: 68-74 (Jan.) 1937.

85. Drinker, Philip, and Shaw, L. A.: *An Apparatus for the Prolonged Administration of Artificial Respiration*, *J. Clin. Investigation* 7: 229 (June) 1929.

Many deaths have resulted from infection of the bladder and kidneys following disease of the spinal cord. A practical device for preventing cystitis was devised by Laver and perfected by Munro in 1934,⁸⁶ namely a tidal drainage apparatus on the principle of a Tantalus siphon. The importance of the apparatus extends far beyond the comfort of the patient and the saving in bed linen. The prevention of infection permits a degree of recovery of damaged nerve tissue which would never be possible otherwise. It is simple and inexpensive and should be available in every hospital.

THE PROSPECT OF FURTHER ADVANCES

Since the war, and especially during the past ten years, something of a revolution has taken place in the field of clinical neurology. From a static branch of medicine, with the ideal of predicting irreversible structural changes from rigidly classified syndromes, it has become more dynamic by advancing in two directions. One is toward interpretation of the activities of an injured nervous system in terms of neurophysiology and thence toward remedying the defect. Examples of this type of analysis and systematic attempts at applications of physiologic knowledge are the recent steps forward in the treatment of epilepsy, paralysis agitans and athetosis, and longer strides in the same directions are unquestionably in prospect.

Another type of dynamic concept which is relatively new in neurology is an analysis of the mechanism and pathogenesis of diseases of the nervous system. The gross and microscopic appearances of the brain and cord in practically all diseases known today were described before the turn of the century. The stages in breakdown of various tissue elements have been thoroughly studied. Attention is now centered on the steps preceding irreparable damage. Arteriosclerosis and neurosyphilis were probably the first diseases in which attempts at dynamic interpretation were made and are still being continued. The mechanism and pathogenesis of multiple sclerosis, next to neurosyphilis and epilepsy the most important disease of the nervous system, are now fairly clear.⁸⁷ Similar advances in the pathology of the deficiency diseases,⁸⁸ progressive muscular atrophy⁸⁸ and amyotrophic lateral sclerosis⁸⁸ are in progress and in the course of time will certainly bear fruit.

The practical understanding and treatment of nervous and mental diseases are still in an expanding stage. The subject grows more complicated with each year that passes, and while there is a proper tendency for diseases formerly considered to lie within the jurisdiction of the neurologist to pass into the hands of internists and general surgeons—for example tetany and hyperthyroidism—the specialized knowledge and interest of trained neurologists, provided with adequate and independent facilities for research, is essential for real progress in the comprehension of many obscure and intricate problems. To reduce clinical neurology to a subdepartment is to subordinate the welfare of patients suffering from diseases of the nervous system.

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86. Munro, Donald: *"The Cord Bladder": Its Definition, Treatment and Prognosis when Associated with Spinal Cord Injuries*, *J. Urol.* 36: 710-729 (Dec.) 1936.

87. Footnote deleted on proof.

88. Putnam, T. J., and Alexander, Leo: *Tissue Damage Resulting from Disease of Cerebral Blood Vessels, in The Cerebral Circulation*, A. Research Nerv. & Ment. Dis., Proc., to be published.

EFFECT OF ALCOHOL ON NORMAL KIDNEY AND KIDNEY OF BRIGHT'S DISEASE

AN EXPERIMENTAL STUDY

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THE EXCRETION OF ALCOHOL BY THE KIDNEY

Alcohol is assumed frequently to be a renal irritant, although the amount eliminated by the kidney after its ingestion is relatively small. Miles¹ has shown that after a single dose of alcohol (about 0.5 cc. per kilogram of body weight) in a human being only 1.2 to 1.6 per cent of the amount ingested is excreted within the first two hours. In the next six hours approximately 0.3 per cent is excreted; the urine is practically alcohol free in eight hours. Haggard and Greenberg² have shown that in dogs the percentage of the total amount of alcohol lost through the kidneys depends on the quantity of urine passed and that in sixteen hours varies from 2.4 to 4.3 per cent of the alcohol ingested. These values confirm the earlier work of Binz,³ Heubach⁴ and others.⁵ In a fatal case of alcohol poisoning, Juckenack⁶ found the concentration of alcohol in the kidney to be 0.37 per cent and in the urine 0.65 per cent.

ALCOHOL AND BRIGHT'S DISEASE

In 1932 Langmead and Hunt⁷ said "The drinker undoubtedly shows some increasing susceptibility to inflammation of the kidney (Bright's disease). . . . Whatever the causal mechanism, there is abundant clinical experience that alcohol may promote chronic nephritis." The treatise in which this statement occurred carried an editorial footnote to the effect that this opinion is not held in this country and that it is not known that alcohol causes chronic nephritis, although its use may aggravate the symptoms of the disease. In 1924 Vogelius⁸ wrote that "very few authors deny

the importance of alcohol intoxication in the occurrence of renal disease." Of the forty-two patients with chronic alcoholism studied by Vogelius, tests of renal function revealed the presence of renal disease in twenty. Scheel⁹ stated that alcoholism in conjunction with other factors may contribute to the development of true contracted kidney. Zundell, Volhard and Strauss⁹ maintained that alcohol exerted a definite influence on the kidney; its use in acute nephritis was absolutely forbidden, whereas in the chronic forms the restriction was less severe. Von Noorden⁹ prescribed alcohol for nephritic patients only when the appetite had to be increased or the heart stimulated. In 1926 MacNider¹⁰ studied the effect of alcohol and of alcoholic beverages on the kidneys of normal and of naturally nephropathic dogs. He found that in normal dogs alcohol was only slightly nephrotoxic whereas naturally nephropathic dogs were more susceptible to the toxic effect of the same amount of alcohol; moreover, both the normal dogs and the dogs with renal disease showed an increased toxicity to alcoholic distillates. Moschini¹¹ reported a case of nephrosis in a nursing infant of 4 months in whom the renal lesion, according to this writer, was due to alcoholism of the mother.

However, a number of authors have published data indicating that alcohol does not initiate or aggravate renal disease. Friedenwald¹² fed a large series of rabbits somewhat excessive doses of either alcohol or whisky daily to the point of intoxication. Although a small number of these animals began to show albumin and casts in the urine after two months of such treatment, the pathologic changes thus produced in the kidney were unlike those seen in chronic nephritis. In 1910 Hultgen¹³ investigated 460 patients with chronic alcoholism and showed that only 9.1 per cent of these manifested any evidence of nephritis. Moreover, only 5.2 per cent of the 460 drinkers showed any permanent albuminuria. He concluded that alcohol taken daily, as it is by the chronic inebriate, is not an irritant to the kidneys. Wegelin¹⁴ reported definite changes in the kidney in only seven of 106 chronic alcoholic addicts. Ziegler and Horner¹⁵ in a recent pathologic study of twenty chronic alcoholic addicts, found only slight glomerular lesions in 20 per cent. Mosenthal¹⁶ maintained that alcohol does not damage the renal parenchyma and that it may be prescribed without hesitation in renal disorders, even when patients are seriously ill. Masci¹⁷ reported an interesting case of acute nephritis in a 41 year old man, who, tired of his restricted regimen, imbibed 2,500 cc. of white wine in three hours. Anuria developed, lasting for twenty-four hours; this was followed by the excretion of markedly hemorrhagic urine. The patient, however, began to improve readily and within ten days after the ingestion of the wine was pronounced cured. The urine was protein free and con-

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Read by title before the American Society for Clinical Investigation, Atlantic City, N. J., in May 1938, abstr. J. Clin. Investigation (Proc) 17:516 (July) 1938.

1. Miles, W. R. Alcohol and Human Efficiency, Publication 333, Carnegie Institution of Washington, 1924.

2. Haggard, H. W., and Greenberg, L. A.: Studies in the Absorption, Distribution, and Elimination of Ethyl Alcohol. II. The Excretion of Alcohol in Urine and Expired Air, and the Distribution of Alcohol Between Air and Water, Blood and Urine, J. Pharmacol. & Exper. Therap. 52:150 (Oct.) 1934.

3. Binz, C. Die Ausscheidung des Weingeistes durch Nieren und Lungen, Arch. f. exper. Path. u. Pharmacol. 6:287, 1877.

4. Heubach, H.: Quantitative Bestimmung des Alkohols im Harn, Arch. f. exper. Path. u. Pharmacol. 8:446, 1878.

5. Strassmann, F.: Untersuchungen über den Nährwerth und die Ausscheidung des Alkohols, Arch. f. d. ges. Physiol. 49:315, 1891. Atwater, W. O., and Benedict, F. G.: An Experimental Inquiry Regarding the Nutritive Value of Alcohol, Mem. Nat. Acad. Sc. 8:231, 1902.

6. Völz, W., and Baudrexel, A.: Ueber die vom tierischen Organismus unter verschiedenen Bedingungen ausgeschiedenen Alkoholen: II. Einfluss des Muskelarbeit auf die Ausscheidung des Alkohols in Atmung und Harn, Arch. f. d. ges. Physiol. 142:47, 1911. Völz, W.; Baudrexel, A., and Dietrich, W.: Ueber die vom tierischen Organismus unter verschiedenen Bedingungen . . .

III. Einfluss des Füllungsstandes des . . . Ausscheidung in Harn und Atmung, . . . ibid. 145:210, 1912. Völz, W., and Baudrexel, A.: Ueber die vom tierischen Organismus unter verschiedenen Bedingungen ausgeschiedenen Alkoholen: IV. Ueber den Einfluss der Dosierung und der Aussen- temperatur auf die Alkoholausscheidung durch Harn und Atmung und über die Resorption des Alkohols durch die Harnblase, ibid. 152:567, 1913.

7. Juckenack, A.: III. Beitrag zum Kapitel "Alkoholvergiftung," Ztschr. f. Unters. d. Nahrungs- u. Genussmittel. 16:732, 1908.

8. Langmead, F. S., and Hunt, T. C.: Alcohol and Man, in Emerson, Haven: Alcohol and the Body's Resistance to Infection, New York, Macmillan Company, 1932, chapter 8, p. 180.

9. Vogelius, F.: Renal Disease in Chronic Alcoholism, Acta med. Scandinav., supplement 7:309, 1924.

10. Cited by Vogelius⁸.
11. MacNider, W. de B.: A Preliminary Paper Concerning the Toxic Effect of Certain Alcoholic Beverages for the Kidney of Normal and Naturally Nephropathic Dogs, J. Pharmacol. & Exper. Therap. 26:97 (Sept.) 1925.

12. Moschini, Stefano. Su di una grave forma di nefrosi in un lattante, Lattante 5:3 (Jan.) 1934.

13. Friedenwald, Julius: The Pathologic Effects of Alcohol on Rabbits. An Experimental Study, J. A. M. A. 45:780 (Sept. 9) 1905.

14. Hultgen, J. F.: Alcohol and Nephritis. A Clinical Study of 460 Cases of Chronic Alcoholism, J. A. M. A. 55:279 (July 23) 1910.

15. Wegelin, C.: Schrupfmiere und Alkoholismus, Schweiz. med. Wchnschr. 61:1181 (Dec. 5) 1931.

16. Ziegler, L. H., and Horner, H. C.: A Clinical and Pathologic Study of Alcoholism, New York State J. Med. 35:921 (Sept. 15) 1935.

17. Mosenthal, H. O.: Variations in Blood Pressure and Nephritis. Oxford Monographs on Diagnosis and Treatment, New York, Oxford University Press, 1931, vol. 7.

18. Masci, B.: Nefrite emorragica guarita in seguito ad intossicazione alcoolica acuta, Policlinico (sez. prat.) 27:761 (July 19) 1920.

tained no red blood cells or casts. The permanence of the cure was proved by a recheck several months later.

In view of the somewhat conflicting evidence as to the effect of alcohol and of alcoholic beverages on the normal and the diseased kidney, it seemed worth while to reinvestigate this problem, since accurate methods are available today for studying the degree of irritation and functional capacity of the kidneys.

MATERIAL AND METHODS

Twenty-one subjects have been studied, of whom five were free from renal disease, five had acute diffuse glomerular nephritis, seven had chronic diffuse glomerular nephritis and five had arteriosclerotic nephritis (nephrosclerosis). All subjects were kept at complete bed rest. The diet was kept constant throughout the

experimental day was set aside in which two determinations of urea clearance²⁰ covering two hours each were carried out before and immediately after the ingestion of alcohol. The amount of alcohol given varied from 50 to 200 cc. of a 25 per cent solution by volume of pure ethyl alcohol or of distilled bonded whisky in amounts equivalent to 100 or 200 cc. of 25 per cent pure ethyl alcohol. After the larger doses, signs of intoxication were invariably present, though only to a mild degree. Specimens of blood were analyzed for urea nitrogen²¹ and nonprotein nitrogen,²² and the urea ratio²³ was calculated. The alcohol content of the blood was also determined.²⁴ On the day on which the alcohol was given the dry diet, starting at 4 p. m., was resumed and the urine collected from 7 p. m. to 7 a. m. the following day. On the following day, if alcohol was again

TABLE 1.—*The Immediate Effect of Alcohol and of Alcoholic Liquors on the Normal Kidney and on the Kidney of Bright's Disease*

Case	Age	Sex	Alcohol Ingested		Positive Results
			Type	Quantity	
Normal Group					
3	26	♂	Alcohol	200 cc 25% solution	Diuresis, urine red blood cells and white blood cells increased but not above normal; blood urea nitrogen slightly increased
6	42	♀	Alcohol	200 cc 25% solution	Diuresis; urine red blood cells increased but not above normal, white blood cells and casts increased above normal; blood urea nitrogen and urea ratio slightly increased; urea clearance increased
9	20	♀	Alcohol	200 cc 25% solution	No significant effects
10	35	♂	Alcohol	200 cc 25% solution	Urea clearance increased
11	10	♂	Alcohol	50 cc. and 100 cc 25% solution in 48 hours	Diuresis, Urine red blood cells, white blood cells and casts increased but not above normal
Group with Acute Diffuse Glomerular Nephritis					
2	44	♂	Alcohol	2 doses of 200 cc. 25% solution in 24 hours	Diuresis; proteinuria increased; urine red blood cells, white blood cells and casts increased; blood urea nitrogen and nonprotein nitrogen increased
16	30	♂	Scotch whisky	57.5 and 115 cc in 24 hours, equivalent to 100 cc and 200 cc 25% solution of alcohol	Slight diuresis, blood urea nitrogen and nonprotein nitrogen increased
19	29	♂	Rye whisky	50 and 100 cc in 24 hours, equivalent to 100 cc and 200 cc 25% solution of alcohol	Diuresis; blood urea nitrogen increased slightly after first dose of alcohol but decreased after second; urea clearance decreased after first dose of alcohol but increased after second
21	30	♂	Rye whisky	50 and 100 cc in 24 hours, equivalent to 100 cc. and 200 cc 25% solution of alcohol	Urine consistent decrease in red blood cells, white blood cells and casts not impaired by ingestion of whisky, blood urea nitrogen and nonprotein nitrogen decreased
Group with Chronic Diffuse Glomerular Nephritis					
7	23	♂	Alcohol	200 cc 25% solution	No significant effects
8	33	♀	Alcohol	200 cc 25% solution	Blood urea nitrogen decreased; urea clearance increased
12	25	♂	Alcohol	50 cc and 100 cc 25% solution in 24 hours	Diuresis; blood urea nitrogen and urea ratio decreased, urea clearance increased
13	42	♀	Alcohol	50 cc 25% solution	Diuresis; urea clearance slightly decreased
14	17	♂	Alcohol	50 cc and 100 cc 25% solution in 24 hours	Diuresis; blood urea nitrogen increased; urea clearance decreased
15	15	♀	Scotch whisky	2 doses of 57.5 cc in 24 hours, equivalent to 100 cc 25% solution of alcohol each	Urine red blood cells and casts decreased, urea clearance temporarily decreased
17	50	♂	Rye whisky	50 cc and 100 cc in 24 hours, equivalent to 100 cc and 200 cc 25% solution of alcohol	Diuresis after second dose only; proteinuria increased
Group with Arteriosclerotic Nephritis					
1	62	♂	Alcohol	2 doses of 200 cc 25% solution in 24 hours	Diuresis, proteinuria increased; urine red blood cells and white blood cells increased; urea clearance decreased
4	41	♀	Alcohol	200 cc 25% solution	Urine casts increased; urea clearance decreased
5	52	♀	Alcohol	200 cc 25% solution	Blood urea nitrogen increased; urea clearance decreased
18	50	♂	Rye whisky	50 cc and 100 cc in 24 hours, equivalent to 100 cc and 200 cc 25% solution of alcohol	Urine red blood cells and casts increased
20	44	♂	Rye whisky	50 cc and 100 cc in 24 hours, equivalent to 100 cc and 200 cc 25% solution of alcohol	Diuresis; urine red blood cells, white blood cells and casts increased; urea clearance decreased

course of study. Addis counts¹⁸ were carried out on twelve hour specimens of urine voided from 7 p. m. to 7 a. m. It was impossible to precede this period by a twelve hour dry diet, as suggested by Addis, since in many cases the restriction of fluid was contraindicated and at other times alcohol was given. For this reason patients were placed on a dry diet three hours prior to the twelve hour collection of urine. Addis counts were carried out daily for from three to five or more days, until the number of formed elements in the urinary sediment exhibited some degree of consistency. Urinary volume was carefully measured, the protein excretion determined¹⁹ and the reaction of the urine noted. After control Addis counts showed satisfactory agreement, an

taken, the urea clearance was determined before and after. However, if no alcohol was given on this particular day, the urea clearance was again determined in the afternoon. In most cases Addis counts were carried out for several days after the ingestion of one or more doses of alcohol.

RESULTS

The pertinent data and positive observations in all cases are given in table 1. The results may be summarized briefly as follows: 1. In subjects with normal

20. Moller, Eggert, McIntosh, J. F., and Van Slyke, D. D. Studies of Urea Excretion II Relationship Between Urine Volume and the Rate of Urea Excretion by Normal Adults, *J. Clin. Investigation* 6: 427 (Dec.) 1928

21. Van Slyke, D. D. Determination of Urea by Gasometric Measurement of the Carbon Dioxide Formed by the Action of Urease, *J. Biol. Chem.* 73: 695 (June) 1927.

22. Folin, Otto, and Wu, Hsien. A System of Blood Analysis, *J. Biol. Chem.* 38: 81 (May) 1919

23. Moenthal, H. O., and Brugger, Maurice. The Urea Ratio as a Measure of Renal Function, *Arch. Int. Med.* 55: 411 (March) 1935.

24. Abel, J. C. A Simple Method for Determination of Ethyl Alcohol in Blood, *Proc. Soc. Exper. Biol. & Med.* 34: 346 (April) 1936

18. Addis, Thomas A. Clinical Classification of Bright's Diseases, *J. A. M. A.* 85: 163 (July 18) 1925

19. Wu, H., and Ling, S. M. Colorimetric Determination of Proteins in Plasma, Cerebrospinal Fluid and Urine, *Chinese J. Physiol.* 1: 161 (April) 1927

kidneys the ingestion of alcohol was occasionally followed by an increase in the excretion of red blood cells, white blood cells and casts in the urine, but the values were rarely elevated above the average normal range. Proteinuria was not induced, nor did any measurable impairment of renal function occur. 2. Alcohol rarely

Addis count (with the exception of patient 5). 5. The renal function remained unchanged after the ingestion of alcohol by persons with acute and chronic diffuse glomerular nephritis. It did not delay the recovery of patients with acute diffuse glomerular nephritis, who showed a gradual improvement in renal efficiency

TABLE 2 (CASE 21)—Observations on a Man Aged 30 with Acute Diffuse Glomerular Nephritis

Date	Time	Volume, Cc.	Specific Gravity	Reaction	Albumin		Addis Count			Urea Nitrogen, Mg. per 100 Cc.	Nonprotein Nitrogen, Mg. per 100 Cc.	Urea Ratio, %	Urea Clearance, % of Normal	Blood Alcohol, Mg. per Cc.
					Gm. per 100 Cc.	Total, Gm.	R.B.C. $\times 10^6$	W.B.C. $\times 10^6$	Casts $\times 10^3$					
19 20	12 hr.	720	19	Acid	.	.	34.92	17.28	2,400	..	..	..	..	.
23-24	12 hr.	620	19	Acid	1.63	10.1	62.00	23.54	3,440	..	..	..	..	.
24-25	12 hr.	470	20	Acid	1.50	7.1	85.00	23.43	3,150	..	..	..	..	.
31-1	12 hr.	750	16	Acid	0.62	4.8	24.57	11.44	3,250	..	..	..	..	.
1-2	12 hr.	620	15	Acid	0.75	4.7	12.40	10.54	2,720	..	..	..	..	.
2-3	12 hr.	860	14	Acid	0.55	4.5	26.00	17.53	3,490	..	..	..	..	.
3-4	12 hr.	730	15	Acid	0.82	5.9	25.55	18.99	1,070	..	..	..	..	.
4-5	12 hr.	830	16	Acid	0.57	4.7	10.70	7.05	1,820	..	..	..	..	.
6-7	12 hr.	740	18	Acid	0.87	6.5	23.30	10.60	1,256	..	..	..	..	.
7-8	12 hr.	1,900	8	Acid	0.15	2.5	11.72	9.50	0.730	..	..	..	..	.
8	12 2								..	21.7	42.2	51	70.3	0
	2	Ingested 50 cc. of rye whisky												
	2 4									21.8	40.8	53	66.2	0.50
8-9	12 hr.	1,430	7	Acid	0.13	1.9	10.25	5.24	0.352	..	..	..	..	.
9	12 2					..		..	..	18.6	..	..	74.4	0
	2	Ingested 100 cc. of rye whisky												
	2 4									18.7	38.0	49	70.5	0.00
9 10	12 hr.	1,250	10	Acid	0.23	2.9	7.91	4.58	0.486	..	..	..	..	.
10	12 2									16.1	30.0	53	72.3	0
10 11	12 hr.	790	16	Acid	0.50	4.0	6.84	11.32	0.550	..	..	..	..	.
11-12	12 hr.	550	15	Acid			3.66	5.86	0.520	..	..	..	..	.
13 14	12 hr.	440	17	Acid	1.25	5.5	3.37	5.23	0.970	..	..	..	..	.
14 15	12 hr.	930	15	Acid	0.83	7.7	2.35	3.72	0.782	..	..	..	..	.

TABLE 3 (CASE 12).—Observations on a Man Aged 25 with Chronic Diffuse Glomerular Nephritis

Date	Time	Volume, Cc.	Specific Gravity	Reaction	Albumin		Addis Count			Urea Nitrogen, Mg. per 100 Cc.	Nonprotein Nitrogen, Mg. per 100 Cc.	Urea Ratio, %	Urea Clearance, % of Normal	Blood Alcohol, Mg. per Cc.
					Gm. per 100 Cc.	Total, Gm.	R.B.C. $\times 10^6$	W.B.C. $\times 10^6$	Casts $\times 10^3$					
26 27	12 hr.	770	8	Acid	0.68	5.2	15.4	19	118.6	..	..	..	..	.
27-28	12 hr.	1,100	6	Acid	0.57	6.3	46.0	24	285.0	..	..	..	..	.
28 29	12 hr.	730	6	Acid	0.74	5.4	54.0	36	800.0	..	..	..	..	.
31 1	12 hr.	450	8	Acid	1.00	4.5	25.0	20	479.0	..	..	..	..	.
1	12 2									43.4	53.1	82	12.3	0
	2	Ingested 50 cc. of 25% alcohol												
	2 4									36.9	48.8	75	16.2	0.20
1 2	12 hr.	615	8	Acid	0.98	6.0	42.0	25	284.0	..	..	..	..	.
2	12 2					..			..	32.2	51.3	63	15.7	0
	2	Ingested 100 cc. of 25% alcohol												
	2 4									32.6	51.3	64	15.5	0.00
2 3	12 hr.	1,270	2	Neutral	0.40	5.1	23.0	5	0*	33.0	47.3	60	16.2	0
3	12 2									..	..	..	..	.
3 4	12 hr.	710	6	Acid	0.69	4.9	63.0	14	477.0	..	..	..	..	.

* The absence of casts in this specimen was probably accounted for by the neutral reaction of the urine.

TABLE 4 (CASE 20)—Observations on a Man Aged 44 with Arteriosclerotic Nephritis

Date	Time	Volume, Cc.	Specific Gravity	Reaction	Albumin		Addis Count			Urea Nitrogen, Mg. per 100 Cc.	Nonprotein Nitrogen, Mg. per 100 Cc.	Urea Ratio, %	Urea Clearance, % of Normal	Blood Alcohol, Mg. per Cc.
					Gm. per 100 Cc.	Total, Gm.	R.B.C. $\times 10^6$	W.B.C. $\times 10^6$	Casts $\times 10^3$					
8-9	12 hr.	850	16	Acid	0.83	7.1	3.95	3.28	440.9	..	..	..	..	.
9 10	12 hr.	550	21	Acid	0.92	5.0	3.30	3.12	427.7	..	..	..	..	.
13 14	12 hr.	730	17	Acid	1.70	12.4	2.19	4.25	603.0	..	..	..	..	.
14 15	12 hr.	820	15	Acid	0.99	8.1	1.64	2.05	533.0	..	..	..	..	.
15 16	12 hr.	720	17	Acid	0.72	5.2	1.89	2.64	333.0	..	..	..	..	.
16	12 2									22.2	40.5	54	57.0	0
	2	Ingested 50 cc. of rye whisky												
	2 4									21.0	36.6	57	64.2	0.00
16 17	12 hr.	1,320	16	Acid	0.47	6.2	2.62	4.62	831.0	..	..	..	..	.
17	12 2					..			..	18.6	40.0	47	55.3	1.10
	2	Ingested 100 cc. of rye whisky												
	2 4									17.3	39.5	44	20.7	0
17-18	12 hr.	1,395	15	Acid	0.27	3.7	18.07	4.40	430.0	..	..	..	..	.
18	12 2									21.6	36.6	59	41.3	..
21 22	12 hr.	1,000	14	Acid	0.77	7.7	5.17	4.60	240.0	..	..	..	..	.

augmented the proteinuria in patients with Bright's disease. 3. Moderate diuresis was frequently induced (this occurred even in patients with marked impairment of renal function). 4. Alcohol did not increase the number of red blood cells and casts in the urine of persons with acute diffuse glomerular nephritis (with the exception of patient 2) or of patients with chronic diffuse glomerular nephritis. The ingestion of alcohol or whisky by patients with arteriosclerotic nephritis (nephrosclerosis) produced a transient increase in the

Impairment of renal function was increased temporarily by the ingestion of alcohol by patients with arteriosclerotic nephritis (nephrosclerosis).

Typical detailed studies of cases of acute diffuse glomerular nephritis, chronic diffuse glomerular nephritis and arteriosclerotic nephritis are given in tables 2, 3 and 4. Table 2 demonstrates that the ingestion of 150 cc. of rye whisky (equivalent to 300 cc. of a 25 per cent solution of pure ethyl alcohol) does not impair the gradual improvement in the Addis count of a patient

with acute diffuse glomerular nephritis. Table 3 shows that the ingestion of 150 cc. of a 25 per cent solution of alcohol by a patient with chronic diffuse glomerular nephritis is not followed by any deleterious effect on renal function; in fact, the functional capacity of the kidneys shows some improvement, as indicated by a decrease in the urea nitrogen content of the blood, by a diminution in the urea ratio and by an increase in the urea clearance. Table 4 demonstrates a marked increase in the number of red blood cells in the urine and a decrease in the urea clearance for a patient with arteriosclerotic nephritis after the ingestion of 100 cc. of rye whisky (equivalent to 200 cc. of a 25 per cent solution of alcohol). No significant effect was observed after the first and smaller dose, 50 cc. of rye whisky.

COMMENT

These studies do not answer the question as to the part played by alcohol in the causation of Bright's disease. However, it is significant that acute and chronic diffuse glomerular nephritis are not aggravated by alcohol and whisky in the doses given, whereas a transient deleterious effect is observed frequently on arteriosclerotic nephritis.

The following hypothetical considerations are offered in an attempt to explain these observations: Since the taking of alcohol in moderate doses is followed by a peripheral vasodilatation (as indicated by the feeling of warmth and flushing of the skin), a redistribution of blood after its ingestion may diminish the flow of blood through the kidneys. In cases of arteriosclerotic nephritis, diverting blood from the kidney to the skin may aggravate the renal lesion, since in such cases the flow of blood is already impaired by vascular sclerosis. With glomerular lesions, however, particularly acute diffuse glomerular nephritis, such a redistribution of blood would tend to reduce congestion in the glomeruli and the taking of alcohol in moderate doses may even be desirable or at least not be followed by undesirable effects.

The diuresis frequently noted after the ingestion of alcohol or of alcoholic beverages is of clinical importance. The diuretic effect is considered to be due to the large amount of fluid usually imbibed with it or to the presence of other substances (as in the distillates), especially volatile oils, and not to a specific action of the alcohol. In 1910 Mendel and Hilditch²⁵ gave two young men 96 cc. of 95 per cent alcohol daily in six doses of 16 cc. each and obtained no diuretic response. Their work has been quoted widely, even in modern textbooks,²⁶ to indicate that alcohol per se is not a diuretic agent. This contention, however, has been refuted by an appreciable amount of work carried out since 1910.²⁷ The present studies show that alcohol

increases the output of urine, even in the presence of decreased functional capacity of the kidneys.

CONCLUSIONS

Alcohol or whisky in moderate doses rarely augments the proteinuria of patients with Bright's disease. Moderate diuresis may be induced even in the presence of marked impairment of renal function. Alcohol or whisky has no deleterious effect on the kidneys of normal subjects, nor does it aggravate the renal lesion in patients with acute or chronic diffuse glomerular nephritis. In patients with arteriosclerotic nephritis (nephrosclerosis) the ingestion of alcohol or of whisky is followed frequently by a transient increase in the number of red and white blood cells and casts excreted in the urine and by a temporary diminution in renal function.

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APPENDICITIS IN ADULTS

REVIEW OF 2,000 CONSECUTIVE CASES, WITH COMMENTS
ON THE RISING MORTALITY OF THE ACUTE
SUPPURATIVE TYPE

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AND

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CLEVELAND

In 1931 one of us¹ reviewed the records of 1,000 consecutive cases of acute suppurative, acute simple and chronic appendicitis in adults as they occurred in the files of Woman's Hospital. This nomenclature was used in accordance with the pathologic reports on the appendixes sent to the hospital laboratory.

In this paper we present a review of the next thousand cases in adults and compare this series with the former one. We were anxious to learn whether there were wide variations in the statistics and to try to explain them if possible (table 1).

It may be seen that there are no great variations in the data for the two series except for the marked increase in the death rate of acute suppurative appendicitis; this rate has increased from 9 per cent in the first series to 23 per cent in the second. Quain and Waldschmidt² reported a mortality rate of 10 per cent in a series of 1,000 cases between 1919 and 1927 and found, as we did, that there was a sharp increase in the mortality to 18.8 per cent in their second series of 1,000 cases during the depression years.

Forty-five of 193 patients in the second group with acute suppurative appendicitis died; the causes are shown in table 2.

In the earlier series the proportions were about the same. These data agree with those of McKenna³ and Davis and his associates.⁴ Davis found among fifty-five deaths forty-one due to immediate and fourteen to remote causes. In McKenna's series fifty-nine were due to immediate and nineteen to remote causes.

From the Woman's Hospital.

1. Watkins, R. M.: The Changing Picture of Appendicitis in Adults. *Ann. Surg.* 94: 197-202 (Aug.) 1931.

2. Quain, E. P., and Waldschmidt, R. H.: Acute Appendicitis. *Arch. Surg.* 16: 868-878 (April) 1928; Quain, E. P.: Acute Appendicitis, *ibid.* 28: 782-785 (April) 1934.

3. McKenna, Hugh: The Reduction of the Increasing Mortality and Morbidity in Acute Appendicitis. *Ann. Surg.* 104: 617-627 (Oct.) 1936.

4. Davis, J. E.; Muske, P. H.; Mulligan, P. L., and Gutov, Julius: Appendicitis. *J. A. M. A.* 108: 1498-1500 (May 1) 1937.

25. Mendel, L. B., and Hilditch, W. W.: The Influence of Alcohol upon Nitrogenous Metabolism in Men and Animals. *Am. J. Physiol.* 27: 1, 1910.

26. Emerson, Haven, and others, editors: Alcohol and Man, New York, Macmillan Company, 1932.

27. Januszkievicz, A.: Ueber Alkoholdiurese, *Ztschr. f. Biol.* 56: 401, 1911. Miles, W. R.: The Comparative Concentrations of Alcohol in Human Blood and Urine at Intervals After Ingestion, *J. Pharmacol. & Exper. Therap.* 20: 265 (Nov.) 1922. Miles, J. Carpenter, T. M.: Human Metabolism with Enemata of Alcohol, Dextrose and Levulose, Publication 369, Carnegie Institution of Washington, 1925, p. 195. Mosonyi, J., and Gömöri, P.: Experimentelle Studien über die diuretische Wirkung des Alkohols, *Arch. f. exper. Path. u. Pharmacol.* 124: 73, 1927. Murray, M. M.: Diuretic Action of Alcohol and Its Relation to Pituitrin, *J. Physiol.* 76: 379 (Nov. 5) 1932. diMacco, G.: Azione dell'alcool etilico sulla capacità di diluizione e di concentrazione del rene nella diuresi provocata, *Riv. di pat. sper.* 8: 459 (July) 1932. Raso, M.: Azione dell'alcool etilico sulla funzione renale: Modificazioni del potere di concentrazione, *Rassegna di terap. e pat. clin.* 4: 473 (Aug.) 1932. Hida, Yoney: Influence of Aliphatic Alcohols upon the Pigment-Excreting Function of the Liver and the Kidneys, *Jap. J. Gastroenterol.* 8: 93 (June) 1936.

WHY HAS THIS MORTALITY INCREASED?

The increase in mortality can be explained in three words: delay in operation. We have in mind three causes for this delay:

A. *Changed Economic Conditions.*—The first thousand cases occurred from about 1925 to 1930, when the nation was in a prosperous state economically. The second series of 1,000 occurred from 1931 to 1936, when conditions were entirely different. The records show that in the early series the patients were ill for 3.8 days before operation and in the later series for 4.9 days. This means that during these depression years patients delayed operation 29 per cent longer than in better times. This surely increased the mortality rate. Quain and Waldschmidt² found that the average time between onset of illness and operation was more than twenty-four hours longer in the second series than in the first and attributed their increase in mortality in part to this delay.

B. *Home Treatment, Especially with Laxatives.*—This subject may be a corollary of the previous one,

reported a series of cases in which one of sixteen patients who used a purgative died, whereas of the 109 who had not used laxatives only one of 109 died.

In our series we tried to estimate from the history the length of time from the rupture of the appendix until the operation.

Twenty-eight of our 190 patients with acute suppurative appendicitis in the second series were operated on less than twenty-four hours after the rupture; only 35 per cent died. Of eighty-six who were operated on forty-eight or more hours after rupture, 32 per cent died.

Giertz⁷ of Stockholm found about the same proportions. His figures are 3.5 per cent mortality if the operation was done within forty-eight hours of the onset of peritonitis and 23 per cent if more than forty-eight hours had intervened.

C. *Delay in Operation Because of Urinary Abnormality.*—In going over the records we were not surprised to find the usual variations in leukocyte counts, temperature and pulse readings, but we did not expect to

TABLE 1.—Composite Statistics (in Percentages)*

	Acute			Chronic		Suppurative			Total
Male	41	49	27	47	60	60	37.6	50.0	
Female	59	51	73	53	40.	40	62.4	50.0	
Pain	99	92	98	93	99.5	98	95.5	76.7	
Nausea	66	66	47	30	78	78	58.7	58.2	
Vomiting	52	48	28	17	66	63	42.4	42.3	
Constipation	38	39	40	21	32	35	38.1	33.0	
Rigidity	51	59	20	4.8	77	79	40.7	47.5	
Distention	7.5	22	5.0	2.4	18.	34	8.5	18.8	
Tenderness at McBurney's point	56	69	50	34	43	64	44.0	56.6	
Tenderness in right lower quadrant	35	74	50	50	53	73	45.9	67.1	
Complications	4.0	4.0	6.0	6.8	7.7.	14	5.8	6.8	
Results (deaths)	2.7	1.2	1.4	1.0	9.3.	23.0	3.3	5.4	
Urinary data	W B C 2.0	14.5	W B C 3.0.	15.2	W B C 5.0	24.2	W B C 3.3	18.0	
	R B C 1.0	5.6	R B C 1.0	3.9	R B C 2.0	12.1	R B C 1.3	7.1	
	Casts 0.0	0.8	Casts 0.8	2.1	Casts 1.2	0.6	Casts 0.6	1.6	
Average values									
Temperature	99.9	100.7	98.7	99.1	100.4	101.1	99.7	100.2	
Pulse rate	95.5	98.0	86.2	84.0	101.0	104.0	94.2	94.5	
White blood cell count	14,340	15,480	10,660	7,940	17,320	14,600	14,100	12,325	

* The figures for the first series are in regular type; for the second, in boldface

because the increase of the use of home measures probably is a mirror of the economic state. During the delay in reaching surgical aid the patient is using various medicines suggested by those about him, and among them, unfortunately, are laxatives. We have gleaned from the records the facts that in the 1925-1930 series 24 per cent of the patients reported the taking of laxatives for their attack, whereas during the later series 42 per cent reported having done so. We feel that the increase of laxative taking has been partly responsible for the increase in mortality. Of the patients who died of what we term immediate causes twenty-one, or 67 per cent, reported taking laxatives. We believe that credit should go to Bower⁵ of Philadelphia for actively campaigning for education of the public in this regard. He compiled the results obtained in several hospitals and found that of 306 patients who died of acute suppurative appendicitis 147, nearly half, had taken laxatives. In another series he reported that 91.6 per cent of 214 patients who died of acute diffuse peritonitis had taken them. Blackburn⁶

find so many laboratory reports of red blood cells in the urine. In the first series only those cases in which a considerable number of red blood cells were reported by the laboratory were noted in the statistics, whereas in the second series any mention of red blood cells, even though of only an occasional cell, was noted, which may account in part for the great variance.

Hematuria Associated with Acute Appendicitis: It has often been said jocularly that every patient with chronic genito-urinary symptoms has a McBurney scar. Genito-urinary symptoms and signs may often obscure the picture of acute appendicitis and thereby delay operation and increase the mortality rate. Hematuria is the most important offender among the urinary abnormalities and deserves discussion.

Collins⁸ reported 1,402 consecutive cases of emergency appendectomy. Hematuria was found in 88 per cent of these. He stated that exclusion of other causes of the hematuria delayed operation an average of four hours and increased mortality from 4.7 to 6.2 per cent. In our series, with acute and suppurative appendicitis

5 Bower, J. O. The Mortality of Acute Appendicitis, J. A. M. A. 99: 1765-1768 (Nov. 19) 1932.
6 Blackburn, J. H. The Factors that Maintain the High Death Rate in Acute Appendicitis, South. M. J. 28: 141-144 (Feb.) 1935.

7 Giertz, K. N. Twenty Five Years' Experience in the Treatment of Peritonitis, Ann. Surg. 104: 712-735 (Oct.) 1936.
8 Collins, D. C. Hematuria Associated with Acute Appendicitis, Urol. & Cutan. Rev. 42: 22 (Jan.) 1938.

hematuria occurred in 7.9 per cent, a not infrequent occurrence. The incidence of hematuria with acute retrocecal appendicitis is great. Collins found it present in 83.9 per cent of his cases and we found it in 62 per cent of ours. This high incidence is due to the close proximity of the acutely inflamed organ to the ureter, causing secondary ureteritis.

TABLE 2.—Causes of Death in Forty-Five Cases of Acute Suppurative Appendicitis

Immediate Causes of Death—	
General peritonitis	18
General peritonitis with paralytic ileus	11
Septicemia	1
General peritonitis with gas gangrene	1
Remote Causes of Death—	
Postoperative pneumonia	13
Pulmonary embolus	1

When the surgeon is confronted with such a condition in a patient suspected of having acute appendicitis, what is he to do? Delay may be dangerous, yet he does not wish to remove a normal appendix. Certainly a quick and reasonably thorough investigation of the urinary tract should be made before any operative procedure is undertaken. Catheterized specimens should be examined to exclude any possible extraneous sources of contamination. If erythrocytes are still present, a plain roentgenogram of the urinary tract is the next step. If this reveals no calculi, he should then take stock of the situation. Often this amount of information, admittedly not thorough, but with the other laboratory data and the clinical picture, is enough to warrant an exploratory laparotomy. There are occasions, however, when the clinical picture is still indefinite, despite this additional information, and the next step is intravenous pyelographic study, to visualize the urinary tract and further to rule out any calculi, ureteral strictures, torsion or tumors. A final step, if time and conditions permit, is cystoscopic study and catheterization of the ureters.

Let us again call attention to the frequency of hematuria in cases of acute appendicitis, particularly if the appendix is retrocecal. We do not believe that a surgeon should relax his vigil when faced with hematuria and allow time to supply the answer. Appendicitis is exacting too high a mortality already. It is the surgeon's duty to conduct a prompt investigation of the urinary tract as thorough as the condition of the patient allows.

Experience of Others.—We do not feel proud of our mortality statistics, but we are not so chagrined when we compare them with others (table 3).

TREATMENT OF DIFFUSE APPENDICAL PERITONITIS

We do not feel it necessary or suitable in this paper to discuss all the details of treatment of appendicitis in general; instead we wish to convey the ideas of ourselves and others with regard to two features of the treatment of diffuse or general peritonitis secondary to acute suppurative appendicitis with rupture. No one form of treatment of this condition is practiced by all surgeons. From the literature we have found that a number of representative surgeons favor deferring any operation in a certain type of diffuse appendical peritonitis. Only a few cases fit into this category, but they are plentiful enough so that the matter should be presented.

A. Deferred Operation.—Coller and Potter⁹ have expressed the belief that operation should be postponed until a propitious time in all cases in which the appendix has ruptured and peritonitis has developed to the extent of being generalized. If they first see the patient two or three days after peritonitis has begun and it has become diffuse, they are inclined, if the patient's condition will allow, to wait from six to eight weeks and to secure as great localization as possible before operating. Guerry¹⁰ has stated the opinion that this plan applies more to late than to early diffuse peritonitis.

If this plan is followed, the well known 1892 Ochsner¹¹ method of treatment is employed. This is directed toward allowing the entire gastrointestinal tract as near complete rest as possible, plus the use of fluids parenterally administered, liberal amounts of opiates, Fowler's position and dry heat to the abdomen.

Again let us emphasize that comparatively few cases arise in which the question of deferred operation occurs.

Reid and his associates¹² have recommended and practiced the Ochsner treatment in certain cases, in the hope of lowering the mortality rate in this small group.

Guerry¹⁰ compared two series. In the first, with immediate operation, the mortality rate was 10 per cent; in the second, in which operation was postponed, the rate was 1.4 per cent.

Coller and Potter⁹ reported a series in which operation was deferred with a death rate of 9.4 per cent.

B. Immediate Operation.—Operation should not be deferred in cases of (1) acute simple appendicitis, (2) early suppurative appendicitis before generalized peritonitis has developed, (3) suppurative appendicitis with localized abscess, (4) general peritonitis associated with pregnancy and (5) doubtful diagnosis.

C. Drainage vs. Nondrainage in Appendical Peritonitis.—We recognize the fact that the policy of deferring operation applies to only a few cases of suppurative appendicitis and that the large majority of

TABLE 3.—Mortality of Appendicitis

Source	Type of Appendicitis	Mortality Rate, %
Reid and his associates ¹² ...	Rupture with localized abscess...	11.4
	Rupture with general peritonitis...	33.9
Davis and his associates ⁴ ...	Acute gangrenous	8.02
	Acute, with rupture	25.5
McKenna ³	Gangrenous with peritonitis	19.0
	Gangrenous with rupture	46.1
Hur, D. K.: Illinois M. J. 69: 447 (May) 1936	Rupture with local peritonitis...	10.0
	Rupture with diffuse peritonitis.	18.5
Nuzum, T. W.: Wisconsin M. J. 35: 109 (Feb.) 1936	Suppurative	7.5
Our Series		
First 1,000	Acute suppurative	9.5
Second 1,000	Acute suppurative	23.3
2,000 averaged	Acute suppurative	16.4

patients should be operated on without delay. The subject we wish to discuss here is when drainage should be used and when not used.

Drainage should be used in all cases of walled-off abscess formation. If the appendix is readily accessible it should be removed; if not, it should be left alone to avoid manipulation with resultant breaking of pro-

9. Coller, F. A., and Potter, E. B.: The Treatment of Peritonitis Associated with Appendicitis, J. A. M. A. 103: 1753-1760 (Dec. 8) 1934.

10. Guerry, LeGrand: Mortality from Appendicitis, J. A. M. A. 107: 1910 (Dec. 5) 1936.

11. Ochsner, A. J.: The Cause of Diffuse Peritonitis Complicating Appendicitis and Its Prevention, J. A. M. A. 26: 1747 (June 22) 1901; abstr., Am. J. Surg. & Gynec. 15: 84, 1902.

12. Reid, M. R.; Peck, D. H., and Merrell, Paul: Statistical Study of 2,921 Cases of Appendicitis, J. A. M. A. 106: 665-669 (Feb. 19) 1936.

tective adhesions and spreading of infection; also, if the appendix is not removed, drainage should be used even though general peritonitis is present. However, if the appendix is removed, and even though general peritonitis is present with free fluid throughout the abdomen, and that fluid frank pus, drainage should not be employed. The objections to drainage in this condition are:

1. It is impossible to drain the entire abdominal cavity.

2. The material forming the drains stimulates the formation of additional adhesions between the abdominal organs and the peritoneal surfaces and increases the danger of intestinal obstruction and mechanical ileus.

3. A wide and weakened incision with its accompanying direct hernia is a frequent complication.

4. These developments prolong hospital stay and expense.

5. These factors definitely increase the mortality rate according to most surgeons.

In this connection Cafritz¹³ quoted Marchini as reporting 285 cases in which drainage was used and 158 in which it was not. In the former group the death rate was 14 per cent and in the latter 5.6 per cent. Krasnoselskiy¹⁴ reported 1,944 cases, with 17 per cent mortality in the drainage group and 1.5 per cent in the nondrainage group. In our own group only nineteen patients were treated by closure without drainage; there was but one death, and that from postoperative pneumonia. The other 171 patients had drainage, and forty-four died, a rate of 25.7 per cent. These figures seem significant, even though our series is small and not divided according to the presence or absence of localized abscess.

REMEDIES

A. *Education of the Public.*—It is probably too soon to estimate the results of the Philadelphia campaign, but it seems to us to be the one most efficient means of getting the public to cooperate by seeking early medical attention for abdominal pain. If economic conditions improve, this delay on the patient's part will be lessened, but in the meantime persons should be told to pocket their pride and seek medical aid regardless of their circumstances if they have pain in the abdomen. For this educational measure the great publicity mediums of newspapers, magazines, radios, public speeches and placards can well be used, as they are being employed now in the campaigns against cancer and syphilis. Especial attention must be placed on the danger of taking purgatives in the presence of abdominal pain.

B. *Education of the Physician.*—It seems trite to state that the physician should be told that with few exceptions appendicitis is a surgical disease. Rarely the patient has another disease that precludes operation, but modern surgery and modern methods of anesthesia make the operation in cases of early involvement so simple that a patient with advanced degenerative disease or serious infection can tolerate it with reasonable safety.

Early operation is another important factor. The mortality rate of chronic and uncomplicated acute appendicitis is so low that it is well worthwhile to remove the organ promptly and avoid the dangers of delay.

13. Cafritz, E. A.: Nondrainage of the Peritoneal Cavity in Appendicitis. *J. A. M. A.* 108: 1315-1317 (April 17) 1937.

14. Krasnoselskiy, M. V.: Treatment of Appendical Peritonitis Without Drainage. *Vestnik khir.* 40: 193, 1935; abstr., *J. A. M. A.* 105: 2120 (Dec 21) 1935.

SUMMARY

We have analyzed another thousand cases of chronic, acute simple and acute suppurative appendicitis in order of occurrence at Woman's Hospital and have found no great variations from the first thousand cases except a sharp increase in the mortality rate (9 per cent to 23 per cent) for the acute suppurative type.

We believe the increased mortality to be due to delay in operation and that in turn to (a) economic causes, (b) the tendency to use home remedies, including purgatives, for a protracted time and (c) complicating factors in diagnosis causing delay in operation.

In a few cases of suppurative appendicitis the operation should be deferred. In the greater number, however, surgical measures should be taken at once. A decrease in the mortality rate can be obtained by education of the public to avoid delay in seeking medical attention and by education of the physician to take prompt action when indicated.

BOWEL ANTIGEN

IV. THE CLINICAL USE OF A NEW METHOD TO DETERMINE THE PRESENCE OF THE VIRUS OF LYMPHOGRANULOMA VENEREUM IN THE DIFFERENTIAL DIAGNOSIS OF INTESTINAL INVOLVEMENTS

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I. EXPERIMENTAL AND CLINICAL BACKGROUND FOR THE CLINICAL USE OF BOWEL ANTIGEN¹

Involvements of the intestine of known cause are those due to neoplasms, bacterial and parasitic infections, bacterial toxins associated with food poisoning, vitamin deficiencies and the excretion of poisonous chemicals. A decade ago lymphogranuloma venereum, now generally regarded as due to a virus, was associated with rectal stricture because of the frequent concomitant occurrence of the latter condition with a positive Frei reaction. More recently some authors have assumed that a positive Frei reaction associated with intestinal diseases indistinguishable pathologically and clinically from bowel disorders of diverse or unknown origin is indicative that this virus is the cause. This is true in many instances, but given a specific case it is not possible merely by means of the Frei reaction to establish such a connection. Even the clinical aspects and the pathologic picture of lymphogranuloma venereum are not pathognomonic.

The most that can be said is that a positive Frei reaction in association with a bowel disorder can suggest the possibility of viral origin. A positive Frei reaction is an allergic intracutaneous response to inactivated bubo pus containing the virus of lymphogranuloma venereum. It merely establishes the fact that the

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1. The term antigen strictly speaking is limited to substances known to engender antibodies when injected into the animal organism. "Bowel antigens" may or may not produce them; their composition is not completely known, but this term has been used because all bowel antigens are manipulated in much the same manner as other true antigens. Bowel antigen and associated terms have also been employed to avoid confusion by readily distinguishing the bowel antigen and its response from the Frei antigen and its reaction.

reacting subject is or has been infected at some time in his life with this virus. The Frei reaction will be positive even though this viral infection has ended as a simple bubo. The viral infection, active, inactive or terminated, resulting in a positive Frei reaction, may bear no relation to the intestinal involvement. A positive Frei reaction does not establish the presence of the virus in any involved tissue except in the bubo. Any other deduction is simply inferential attended by all the limitations of such reasoning. Indeed, not all patients infected with the virus of lymphogranuloma venereum, with or without concomitant intestinal disturbances, give positive Frei reactions.

Bowel antigen—a new, practical diagnostic aid—appears to offer a more direct and specific method of determining the presence of the virus in intestinal tissue and discharge, both ante and post mortem. Inactivated blood, mucus, pus and intestinal contents grossly free from feces compose what is known as a bowel discharge antigen. Bowel tissue free from fecal contamination, preferably fresh and unfixed, macerated and inactivated, makes up bowel tissue antigen. The preparation of the patient and the technic for the securing of material for use as bowel antigens, the preparation of the antigens, their intracutaneous inoculations into a minimum of three subjects known to have a positive reaction to the Frei antigen and into at least three controls, neither group manifesting any systemic disorder or organic gastrointestinal disease, and the interpretations of the reactions have been discussed in detail elsewhere.²

A positive reaction to bowel antigen parallels the positive response to Frei antigen inoculated simultaneously for purposes of comparison.

A positive bowel antigen (one producing positive reactions) indicates the presence of the virus in the tissue or in the discharge of the patient from whom the material was secured. A negative bowel tissue antigen prepared from actively involved tissue is more significant than a negative bowel discharge antigen, because in the latter the antigenic material may be too greatly diluted or lost as a result of dysentery. Neither type of negative antigen determines the absence of the virus as conclusively as a positive antigen indicates its presence.

The conclusion that a positive bowel antigen indicates the presence of the virus in the tissue or discharge of the patient from whom it was secured is based on analogy and experimental evidence, which also indicates its pathogenic significance.

A. Analogy.—A positive bowel antigen like the Frei antigen will produce positive responses in persons known to have been infected with the virus of lymphogranuloma venereum. The type of intradermal reaction, unlike any produced by known bacteria, toxins, foreign proteins or other allergens, and their interpretations are identical. Strains of both Frei and bowel antigens vary similarly in their antigenic qualities. Control subjects, free from systemic or organic gastrointestinal disease, give negative reactions to both types of antigens. Bowel antigens produce a negligible number of false positive reactions. This is striking when one considers their present crudity.

The only reference encountered to work of a similar nature is that of Nicolas, Favre, Lebeuf and Charpy,³ who secured an antigen from the pus exuding from a fistula of a person with anorectal elephantiasis and a positive Frei reaction. In three persons with positive Frei reactions this antigen produced a positive response. No control work of any nature or details of technic and of interpretations are reported. A similar effort with material from a similar source was reported by Wien and Perlstein. The same criticism can be offered of their work.

B. Experimental Evidence.—1. Findlay⁴ summarized the data to 1936 as follows:

Ravaut, Levaditi, Lambling and Cachera (1932), and Laederich, Levaditi, Mamou and Beauchesne (1932), by an ingenious technic, isolated from inflamed rectal tissue [vegetation secured by biopsy] a virus which agreed in every way with the viruses isolated from cases of lymphogranuloma inguinale by Hellström and Wassén (1930), Levaditi et al. (1931) and Findlay (1932). A similar virus isolated by Mocquot, Levaditi and Reinié (1935), from an inflammatory condition [vegetation secured by biopsy] of the colon, proved of considerable interest, for with this strain Levaditi, Mollaret and Reinié (1935) produced the histological changes characteristic of lymphogranuloma inguinale in the rectum of chimpanzees by direct inoculation into the mucosa, while in human volunteers they reproduced the primary penile sore with involvement of the inguinal glands—the lesions typical of lymphogranuloma inguinale. [The human subjects were negative to the Frei antigen prior to the inoculation and positive to it subsequently.] A green monkey *Cercopithecus calli thrix* was inoculated (Findlay, 1935) immediately anterior to the rectum, with a virus isolated in this country from the enlarged inguinal glands of a patient with genital lymphogranuloma inguinale and passed through mouse brains. Ten days after inoculation the monkey was killed and a swelling about the size of a hazelnut was found at the site of injection, while the mesenteric glands were swollen. From the inflamed tissues involving the rectal wall—which histologically were characteristic of lymphogranuloma inguinale—and from the mesenteric lymph nodes there was recovered a virus that produced meningitis in mice and resembled in all respects the virus of lymphogranuloma inguinale. There is thus little doubt that the same virus is responsible both for the genital lesions of lymphogranuloma inguinale and for the rectal lesions associated with certain cases of stricture.

2. A male dog was parenterally inoculated by me⁵ with uninactivated bowel discharge from a patient from whom a positive bowel discharge antigen had been obtained. The dog's intradermal reactions to two active human Frei antigens were positive at fourteen days. Prior to administration of bowel discharge the animal gave a negative reaction to three active Frei antigens, one of which produced one of the two positive reactions referred to. A control antigen consisting of inactivated bubo pus of nonspecific origin from several human sources produced no reaction. This, it is believed, tends to establish further that the virus is present in material from which a positive bowel antigen is made, and the intradermal response is brought about by the virus or an associated product.

A stricture or vegetations with or without colitis have not been produced with this virus experimentally. The evidence to date seems to establish that the virus is present in vegetations and strictures associated with

3. Nicolas, J.; Favre, M.; Lebeuf, F., and Charpy, J.: Intradermo-réactions positives dans la maladie de Nicolas-Favre (trois cas) avec une antigène tiré d'une forme anorectale élephantiasique de la maladie, *Bull. Soc. franç. de dermat. et syph.* 39: 24 (Jan.) 1932.

4. Findlay, G. M., in Discussion on the Etiology and Treatment of Fibrous Stricture of the Rectum (Including Lymphogranuloma Inguinale), *Proc. Roy. Soc. Med.* 29: 1449 (Sept.) 1936.

5. Paulson, Moses: III. The Diagnosis of Colitis Associated with the Virus of Lymphogranuloma Venereum by Bowel Antigen, *Am. J. Digest. Dis. & Nutrition* 5: 554-562 (Nov.) 1938.

with Positive Frei Tests, *Am. J. Digest. Dis. & Nutrition* 3: 667-673 (Nov.) 1936; A New Diagnostic Intradermal Reaction with Bowel Antigen Indicating the Presence of the Virus of Venereal Lymphogranuloma in the Intestine and Differentiating Colitis Associated with that Virus, *J. A. M. A.* 109: 1880-1886 (Dec. 4) 1937; footnote 5.

rectal involvements in many persons with positive Frei reactions. It also shows that it is present in the bowel discharge as well as in bowel tissue, with or without stricture, elephantiasis or fistula. The evidence points out that this agent is identical with the virus encountered in the genital phase of lymphogranuloma venereum. The ability of the virus obtained from rectal vegetations to reproduce genital lymphogranuloma, venereum in man, and inguinal adenopathy and meningo-encephalitis in lower animals establishes its pathogenic propensities. In view of this and much striking clinical evidence, it seems reasonably safe to assume at this time that the presence of the virus in the intestine as indicated by a positive bowel antigen is of pathogenic significance. Bowel antigen seems now to have made possible the practical clinical application of the experimental data adduced heretofore.

II. THE APPLICATION AND SIGNIFICANCE OF BOWEL ANTIGEN IN CLINICAL PRACTICE . . .

A. Rectal Stricture.—The colonic involvement commonly recognized as due to the virus of lymphogranuloma venereum is the advanced stage of the disease. It appears as a rectal stricture in a person with a positive Frei reaction, frequently with fistulas and anal and genital elephantiasis, often associated with ulceration and polyposis. This relatively easily recognized clinical picture is now no longer a diagnostic problem. The use of bowel antigen here would not seem essential; however, its use may be desirable for confirmation.

This clinical state, even in the absence of a positive Frei reaction, has been considered as due to this virus. The discrepancy is explained on the basis of anergy. It has been estimated by Frei that about 10 per cent of such cases manifest anergy. The actual extent of this phenomenon is not known, since not all rectal strictures and not all the so-called typical clinical states referred to are due to the virus of lymphogranuloma venereum. Also, the extent of anergy in the absence of this advanced stage or in states indistinguishable from those brought about by other agents has yet to be determined. At this writing the only direct method of establishing anergy in either of these typical or less typical conditions rests on the procuring of a positive bowel antigen.

The following cases of the typical or advanced bowel states usually associated with lymphogranuloma venereum but with negative Frei reactions are illustrative of the use and significance of bowel antigen:

CASE 1.—A white man, an American, aged 59, seen in 1937 because of rectal stricture and ulcerative colitis, in 1922 had had inguinal adenopathy on the right which was drained. In 1927 a stricture of the lower part of the rectum was discovered. In 1937, when the Frei antigen was first used on him, he gave a negative reaction to five active human strains.

Was the bubo due to the virus of lymphogranuloma venereum? Were the colitis and stricture, occurring five years after his bubo, due to this virus? Were they unrelated? Was this case one of anergy?

His bowel discharge antigen produced eight positive and five negative responses in thirteen patients with positive Frei reactions and twenty-three negative reactions in twenty-three patients with negative Frei reactions. Here bowel antigen indicated clearly that the problem—one of anergy—was associated with the virus of lymphogranuloma venereum.

CASE 2.—A white woman aged 48, seen in consultation by me in the diagnostic clinic of the Johns Hopkins Hospital for rectal pain and bleeding, five years previously had undergone

excision of the left kidney presumably for relief of lithiasis. A sinus exuding pus persisted in the postoperative wound. The perineum and labia majora were "indurated and stony hard"; the vagina did not permit the insertion of a finger. The anus, through which only the tip of the small finger could be inserted, was strictured and fissured and discharged pus; a rectoscope with a two-eighths inch diameter could not be passed for more than 2 or 3 cm. The anogenital tissues were hypertrophied.

Both the gynecologist and I at first thought the problem to be one of lymphogranuloma venereum, for the clinical picture was highly suggestive. When the patient failed to react to five different strains of active human Frei antigen, the following questions arose: Was the case one of anergy? The sinus persisting after nephrectomy suggested tuberculosis. The Wassermann reaction of the blood was negative, and the patient had had no antisyphilitic therapy. Was the condition malignant? A biopsy specimen of anal tissue and a bowel discharge antigen were obtained. Injection into guinea-pigs of material from the nephrectomy wound produced no sign of tuberculosis. The bowel antigen gave negative results and the pathologist reported squamous cell carcinoma.

This case teaches that even the advanced clinical state said to be typical of lymphogranuloma venereum may be a manifestation of other conditions. As lymphogranuloma venereum is increasingly emphasized, there is danger of overlooking or forgetting other etiologic factors in clinically similar situations. Lymphogranuloma venereum, which in this instance at first seemed unmistakable, could not be established. While it is still possible that the virus may have borne some relation to this problem, experience with bowel antigen appears to make this possibility more remote.

Further Comment: The significance of bowel antigen is emphasized when these two illustrative cases and their implications are considered together. Both patients were white, one a man and the other a woman; both presented strictures; the man also had ulcerative colitis above the stricture; both failed to respond to multiple active human Frei antigens; both had the typical clinical picture of lymphogranuloma venereum, the man giving a history of the genital phase, the woman—as is often the case—having no knowledge of the earlier phases. Only by inference, by virtue of the so-called typical clinical picture, could it be assumed that the infection in each case was due to the virus of lymphogranuloma venereum. Even this inference was not particularly strong when the patients failed to respond to the Frei antigen. In the man, the presence of the virus was determined by obtaining a positive bowel antigen, not an inferential but a direct diagnostic procedure. The woman's antigen was negative and the problem was solved by the finding of squamous cell carcinoma. Bowel antigen provides a direct indication of the presence of intestinal venereal lymphogranuloma. It reduces the necessity for inference. What inference may lead to is exemplified specifically by the fact that for years every stricture of the rectum was regarded as due to syphilis because some persons with strictures had positive Wassermann reactions.

B. Other Intestinal Conditions.—Bowel antigen is of import in the differential diagnosis of intestinal disorders, particularly when the clinical manifestations appear to be at variance with the so-called typical clinical distal state of intestinal lymphogranuloma venereum already referred to. It is with such problems now not generally recognized as possibly associated

with this virus, that bowel antigen should find its greatest usefulness, as indicated by the following cases:

1. Dysentery:

CASE 3.—*Ulcerative colitis with a negative Frei reaction.* A Negress aged 24, examined Dec. 22, 1937, because of rectal pain and bleeding on defecation, had noted a "lump in the right groin" on November 18. Gynecologic examination revealed bilateral inguinal adenopathy. There was no rectovaginal fistula or anogenital elephantiasis. Vaginal smears showed no gonococci. She failed to react to chancroidal vaccine and to multiple human Frei antigens as late as May 1938, and numerous attempts to aspirate pus from the buboes were unsuccessful. Rectosigmoidoscopic study revealed progressively severe colitis without mass or stricture, exuding blood and mucus and extending from the anorectal margin 12 or 15 cm., the brunt of the involvement being within the first 5 cm. Bacteriologic, parasitologic, serologic and roentgenologic study gave no significant information.

My inability to ascribe this patient's inguinal adenopathy to lymphogranuloma venereum, her consistent failure to react to multiple human Frei antigens, the absence of an intestinal or genital picture suggestive of lymphogranuloma venereum and the lack of evidence suggesting any other etiologic agent resulted in the condition being designated nonspecific ulcerative colitis.

However, the bowel antigen obtained in this case gave six positive reactions in eleven patients with positive Frei reactions and no reactions in ten patients with negative Frei reactions. A positive discharge antigen from the generative tract was also secured. This will be the subject of a forthcoming publication.

Thus it was demonstrated with bowel antigen that this apparent nonspecific ulcerative colitis was actually associated with the virus of lymphogranuloma venereum. Anergy, in this case not clinically typical of lymphogranuloma venereum, could have been discovered only by this procedure.

Anergy, together with the failure to recognize the possible association of this virus with intestinal conditions different in appearance from those described as "typical," results in a reported frequency of viral infection lower than the probable true incidence. Bowel antigen should aid in such determination.

CASE 4.—*Ulcerative colitis with a positive Frei reaction.* A Negro aged 19 with a positive Frei reaction had typical, apparently indeterminate ulcerative colitis without stricture three years after a bubo involvement. Was the intestinal disorder unrelated to his venereal disease? The answer rests on the fact that ten of eleven patients with positive Frei reactions gave positive reactions to his bowel discharge antigen; eighteen with negative Frei reactions gave negative reactions to it; there were no false positive reactions.

Further Comment: What might be expected from the use of bowel antigen is again emphasized when the two foregoing cases are considered together. Both patients had had buboes; the man gave positive Frei reactions; the woman failed repeatedly to respond to multiple active strains of human Frei antigen. Both had apparent typical nonspecific ulcerative colitis. If inference were to establish the virus of lymphogranuloma venereum as the cause of ulcerative colitis because of a positive Frei reaction and a previous bubo in the case of the man, was inference also to result in the contrary conclusion for the woman when there was a bubo which might have been due to any one of several agents and no response to the Frei antigen? A positive bowel antigen from each solved the problem not by inference but by directly indicating the presence of the virus of lymphogranuloma venereum in the involved intestine. Clinically such a result might well be regarded as of etiologic significance.

Bowel antigen makes possible the detection of intestinal venereal lymphogranuloma before the clinical picture becomes advanced and typical, thus facilitating early therapy in the hope of avoiding the later, frequently incurable manifestations. The incidence of venereal lymphogranuloma in cases of so-called typical ulcerative colitis is as yet not known. Bowel antigen offers the only practical available means for its determination.

2. Inflammation of the Terminal Portion of the Ileum, Cecum and Ascending Colon with Positive Frei Reaction:

CASE 5.—A Negro aged 27 came to the hospital Oct. 28, 1937, because of a painful lump to the right of the umbilicus, which he had noted for the first time two days prior to admission. Two weeks earlier he experienced a generalized dull ache in the right upper part of the abdomen, which apparently had come on during the course of an evening and persisted until admission. There was daily defecation. No change in the consistency of the stools, no mucus, pus or bright red blood in the feces and no melena, nausea, vomiting, chills or urinary symptoms were encountered. The temperature was 100.2 F., the pulse rate 78, the respiratory rate 18, and the blood pressure 112/80. A movable tender mass, not attached to the liver, 2 inches to the right of the umbilicus was noted. Rectal examination including examination of the prostate gave negative results. The urine was normal, and the white blood cell count was 12,000. The tentative diagnosis was of "inflamed appendix causing inflammation and matting of a loop of the intestine, or a cecal mass either tuberculous or malignant."

In 1934 he was seen during intense abdominal pain and in mild shock. A perforated duodenal ulcer was closed. In 1930 he had had gonorrhea.

At operation it was difficult to decide whether the condition of the resected cecum, ascending colon and terminal portion of the ileum was inflammatory or malignant. The impression of the pathologist, who found a foreign body ("a piece of wood or a piece of peach or prune pit") embedded in the mass, was that the process was active nonspecific inflammation. It appeared not unlike that described for either regional ileitis or lymphogranuloma venereum. The results of subsequent efforts to clarify its causation with respect to tuberculosis and infection by the typhoid-paratyphoid-dysentery group of organisms were negative. The patient did not respond to Ducey bacillus antigen. He gave a positive Frei reaction, but he stated that he had had no bubo involvement and there was no inguinal scarring.

The clinical manifestations and gross and microscopic study of tissue and other investigations offered no aid in ascertaining the cause. The positive Frei reaction merely suggested a possible association between the virus of lymphogranuloma venereum and the lesion. The bowel tissue antigen was negative in six cases of positive and in six of negative Frei reactions.

If the virus was the cause of such an active process, it was reasonable to expect its presence in the involved tissue and hence its manifestation by this method because of the relative ease with which I have secured positive tissue antigens from the rectum and sigmoid flexure. At any rate, this negative antigen casts further doubt on the inference that because the Frei test gave a positive result the virus of lymphogranuloma venereum was the causative agent.

Bowel tissue antigen and bowel discharge antigen should be employed in all cases of obscure intestinal disorders. When there is a positive Frei reaction, bowel antigen offers the only practical method to determine the connection between such a reaction and the cause of the lesion. Even when the Frei test is negative, the virus may be present in the lesion (anergy). Bowel antigen is the only available practical means by which the cause in these cases can be discovered.

III. SUMMARY

The evidence to date—experimental and clinical—supports the view that the virus of lymphogranuloma venereum in intestinal discharge or tissue is of pathogenic significance. The only direct clinical method now available to determine the presence of the virus in such sources is in the use of bowel antigen. When bowel antigen is positive it indicates the virus of lymphogranuloma venereum in the bowel tissue or discharge from which it is obtained.

Bowel antigen is important because:

1. The clinical picture is not pathognomonic. The so-called typical state of intestinal lymphogranuloma venereum is not always caused by this virus.

2. Some cases clinically indistinguishable from non-specific ulcerative proctitis or colitis are found associated with the virus of lymphogranuloma venereum by means of bowel antigen.

3. The pathologic picture—grossly and histologically—is not pathognomonic. Bowel antigen may aid in differential diagnosis ante and post mortem.

4. The Frei antigen alone in differential diagnosis is inadequate because:

(a) The patient may give no reaction to Frei antigen, and bowel antigen may indicate virus presence (anergy).

(b) A positive Frei reaction may be produced by an antedated or healed virus infection or one unrelated to the bowel disturbance.

Medical Arts Building.

ALLERGIC MANIFESTATIONS WITH INJECTION TREATMENT OF VARICOSE VEINS

DEATH FOLLOWING AN INJECTION OF MONOETHANOLAMINE OLEATE (MONOLATE)

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Deaths resulting from injections given in the treatment of varicose veins fortunately have been very rare. Reports of death due to emboli have practically disappeared from the medical literature since the use of coagulant solutions has been given up and since the realization has become general that the patients during the course of their treatment must be kept ambulatory.

However, the hazard from the phenomena of allergy has not been eliminated and remains a real danger which must be borne in mind continuously by surgeons using injections in the treatment of varicose veins.

REACTIONS ACCORDING TO THE SOLUTION USED

The various sodium chloride or sugar solutions are not entirely free from this danger, as nitrogenous impurities may be contained in them. The resultant reactions of course should occur but rarely and be minor. That they do occur is borne out by Probestein's¹ report of a nitritoid reaction after the injection of a solution of invert sugar. In 1938 a case² was described in which dermatitis of the involved leg with a

slight dermatitis on both arms and the sacral region developed after the second injection of the solution.

In addition to the typical evidences of salicylism which frequently follow the use of sodium salicylate for injecting varicose veins, Meisen³ has noted urticaria following its use.

Quinine, when used as a solution of quinine urethane, not infrequently causes urticaria or dermatitis, which may even develop into severe weeping eczema. Immediately after the injection of this solution into a patient sensitive to quinine a generalized urticaria may develop, associated with asthma so severe that the patient is unable to breathe until given a large dose of epinephrine hydrochloride. I know of no case in which this has been fatal but have never seen a case in which epinephrine was not given immediately.

Sodium morrhuate causes a variety of allergic reactions. This fact is not surprising, in that in the preparation of this solution it is impossible to remove all nitrogenous materials contained in the cod liver oil. In 1932 Ritchie⁴ called attention to these reactions and described the following three types:

1. Erythematous or urticarial manifestations of the skin.

2. Gastrointestinal disturbances with abdominal pain and diarrhea appearing shortly after injection.

3. Collapse with cyanosis, pallor, low blood pressure and temporary loss of consciousness.

To cases of the first type I would add those in which in the course of treatment by injections of the sodium morrhuate solution an itching, thickened, red area appears in the skin over the veins injected some time previously. If the injections of this solution are stopped this rash disappears, but if the treatment is continued the condition spreads, soon becoming a fairly well generalized weeping eczema.

The second type described by Ritchie⁴ is probably only a mild form of the third, which is of course a severe nitritoid reaction and, when sufficiently severe, may cause death. Levi⁵ in 1938 called attention to the fact that deaths have followed the injection of sodium morrhuate. That death occurs oftener than the medical literature would indicate is evidenced by the fact that one physician from the medical examiner's office in New York City, as he has advised me, has seen three such deaths in the course of his duties, none of which have been reported in any medical magazine. These reactions, as is typical of the greater number of the severe reactions following the injection of sodium morrhuate, occurred with the first or second injection following at an interval after a previous series of injections of the same solution. Lewis⁶ and Zimmermann⁷ have described this type of sensitization phenomenon, but in patients who recovered from the resulting reactions.

On a number of occasions I have seen a similar but milder reaction following the patient's first injection of sodium morrhuate solution. It is impossible, of course, to prove that these less severe manifestations may not have been psychic.

3. Meisen, Valdemar: *Varicose Veins and Haemorrhoids and Their Treatment*, New York, Oxford University Press, 1932.

4. Ritchie, Alison: *Treatment of Varicose Veins During Pregnancy*, abstr. Edinburgh M. J., November, 1933, pp. 157-164.

5. Levi, David: *The Injection Treatment of Varicose Veins*, in Rolleston, Humphry, and Moncrieff, A. A.: *Practical Procedures*, London, Eyre and Spottiswoode, 1938; reviewed in M. World, London 48: 234 (April 22) 1938.

6. Lewis, K. M.: *Anaphylaxis Due to Sodium Morrhuate*, J. A. M. A. 107: 1298 (Oct. 17) 1936.

7. Zimmermann, L. M.: *Allergic-like Reactions from Sodium Morrhuate in Obliteration of Varicose Veins*, J. A. M. A. 102: 1216-1217 (April 14) 1934.

1. Probestein, J. S.: *Major Complications of Intravenous Therapy*, J. Missouri M. A. 33: 349-352 (Sept.) 1936.
2. Dermatitis from Invert Sugar for Varicose Vein Injections, *Queries and Minor Notes*, J. A. M. A. 110: 1774 (May 21) 1938.

That cessation of treatment for a period is not necessary to the development of this allergic state is testified to by the case reported by Dale,⁸ in which a severe nitritoid reaction followed the thirteenth in a series of injections spaced at regular intervals. Hatcher and Long⁹ reported a case in which a reaction occurred in the course of the first series of injections and another when the treatment was resumed at a later date. The second reaction developed before the tourniquet was removed from the patient's leg. Both reactions were very severe but complete recovery ensued in about four hours.

For nearly two years monoethanolamine oleate (monolate) has been my solution of choice for varicose veins. This solution is made of a synthesized chemical and for this reason the possibility of its containing nitrogenous materials has theoretically been eliminated. Until the time of treatment in the case to be reported I had used this solution in the treatment of more than 200 patients and had seen no reactions of any kind following its use. I have continued to use it since and have observed no other reaction of any kind. The manufacturers have received no reports of reactions, with the exception of a few of a very mild nature. Meyer¹⁰ observed no allergic manifestations following the use of monoethanolamine oleate in a small series of cases.

REPORT OF CASE

Miss A. S., a well developed and slightly obese white English woman aged 57, referred for treatment of varicose veins Jan. 17, 1936, had extensive varicosities of the great and small saphenous systems in both legs. She had had no previous treatment. Injections of from 3 to 5 cc. of 5 per cent solution of sodium morrhuate were given at intervals until August 10, thirteen injections having been given up to that time. There was no evidence of any type of reaction to these injections.

The condition of the legs was greatly improved, although a fair number of varicosities remained which had not been injected. However, she felt so greatly improved at that time that she did not return to the office until May 2, 1938.

A week previous to this time a superficial varicosity over the left tibia had ruptured, but the resulting hemorrhage had been readily controlled by pressure. Examination revealed a considerable number of new varicosities in addition to those which had not been treated in 1936. Many of the veins which had been previously injected could still be felt as firm fibrous cords.

Because of the interval since the use of sodium morrhuate, its use was considered to be contraindicated. May 2, 1938, 2 cc. of monoethanolamine oleate was injected into a vein in the left leg. There was no reaction and a satisfactory closure of the varicosity was obtained. May 9, 4 cc. was injected into another vein in the left leg, again with no reaction and an excellent closure.

May 16, 4 cc. was again injected into a vein in the left leg. There was no immediate reaction of any kind. As had been done after each previous injection, the leg was elevated to permit the solution to empty from the vein. The patient sat quietly for about ten minutes and then dressed. She walked about 50 feet to the front door of the office, when she felt somewhat faint. She walked back into the office and sat down in a chair, where she had a generalized convulsion, to all appearances typical of that seen in epilepsy. With it she lost consciousness. Her pulse and color were excellent. In about forty-five seconds the convulsion ceased; she became conscious and was able to talk. To all appearances she was completely recovered.

After about two minutes she said that she could not breathe and lost consciousness again, but without any convulsion or muscular spasm. She ceased breathing and within two or three

minutes became pulseless. Epinephrine hydrochloride was given intravenously and then into the heart, without effect. Artificial respiration was maintained from the onset of the second episode in the reaction for about thirty minutes.

An autopsy performed by Dr. Philip Goldstein, acting assistant medical examiner, revealed nothing but visceral congestion. If the death was due to any cause other than the injected monoethanolamine oleate solution, no evidence of such circumstance could be found.

COMMENT

Apparently death in this case was due to an allergic reaction, although the clinical picture was not typical. The interval of about fifteen minutes before the onset of the convulsion, the convulsion without marked change in the pulse or the patient's color and the apparently complete recovery followed by failure of respiration and cardiac action without any appreciable response to intravenous and intracardiac injections of epinephrine, were certainly not the manifestations expected with a nitritoid reaction.

Of course, rarely an allergic reaction may be evidenced in the form of a convulsion. I have a patient now nearly 40 years of age who since childhood has had a convulsion with loss of consciousness whenever she eats cod fish and at no other time. Another patient, now 25 years of age, since childhood has had a typical grand mal convulsion with loss of consciousness whenever she eats chocolate, and at no other time.

In the present case sensitivity must have developed from the two previous injections of monoethanolamine oleate, although the previous injections of sodium morrhuate may have had some bearing on the development of the allergy, in that chemicals similar to those in monoethanolamine oleate are contained in the sodium morrhuate. Meyer¹⁰ mentioned two patients, treated first with sodium morrhuate and then with monoethanolamine oleate without any allergic reaction, who had typical allergic reactions when injections of sodium morrhuate were resumed.

PREVENTION OR AVOIDANCE OF REACTIONS

The question of the prevention or avoidance of the reactions encountered in the course of treating varicose veins by injections is most difficult and no satisfactory answer is available at the present time.

Small test doses of the solution used may reveal a sensitivity present before treatment is started but do not point out what patients will become sensitive in the course of treatment.

Mild reactions of various types will in most cases serve to warn the surgeon that a different solution should be used. Watching for these minor reactions and using them as a danger signal will aid greatly in avoiding the development of the major reactions.

After an interval in a course of treatment, various surgeons have suggested the use of intradermal tests for sensitivity before the resumption of injections with the previously used solution. This procedure cannot be counted on to rule out all patients who will later have a severe reaction, as a full dose of the material given intravenously may cause no reaction whatever for one or more injections in the new series and then be followed by a severe reaction. I start with small amounts, from 0.25 to 0.5 cc., and gradually increase the amount until the desired dose is reached, but I do not feel that this will prevent or foretell a reaction later in the series of treatments.

The commonest time for severe reactions is on the resumption of treatment after a temporary cessation of

8. Dale, M. L.: Reaction Due to the Injection of Sodium Morrhuate. *J. A. M. A.* 108: 718-719 (Feb. 27) 1937.
9. Hatcher, M. B., and Long, H. W.: Unfavorable Reaction from Sodium Morrhuate. *J. M. A. Georgia* 26: 427-428 (Aug.) 1937.
10. Meyer, N. E.: Monoethanolamine Oleate: A New Chemical for the Obliteration of Varicose Veins. *Am. J. Surg.* 40: 628-629 (June) 1938.

treatment with sodium morrhuate. Rather than to rely on the intradermal or intravenous tests for sensitization, it might be better in this circumstance always to use some other solution.

TREATMENT OF THE ALLERGIC REACTIONS TO SOLUTIONS USED FOR THE TREATMENT OF VARICOSE VEINS

For the milder types of reactions, whether they are cutaneous manifestations or minor generalized nitritoid reactions, cessation of the use of the causative drug is the only treatment required.

For the severe urticarial and asthmatic type of reaction, administration of 7, 15 or if necessary 30 minims (0.4, 1 or 2 cc.) of 1:1,000 solution of epinephrine hydrochloride will give prompt and complete relief.

For the severe generalized nitritoid reactions, epinephrine, dextrose and saline solutions given intravenously, caffeine, sodium benzoate and coramine with the application of external heat and, when necessary, artificial respiration will prevent death in nearly every case.

After any type of reaction the solution which caused that reaction should not be used for the same patient at any later time.

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IS NUTRITIONAL DEFICIENCY THE BASIS OF WERNICKE'S DISEASE?

REPORT OF CASE

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In 1881 Wernicke¹ described under the formidable title "encephalitis haemorrhagica superior" a disease affecting the nuclei of the nerves to the eye muscles which leads to death in a few days. The clinical signs consist of paralysis of the eye muscles, a reeling gait and disturbances of consciousness—a terminal somnolence which may or may not be preceded by a period of excitement. This syndrome has been found occasionally in association with Korsakoff's psychosis (Bonhoeffer¹) and with polyneuritis. Tachycardia (unassociated with fever) is common, and disturbances of breathing are sometimes observed. There is an occasional report of recovery.

Perhaps the most typical anatomic feature of the disease² is the distribution of the lesions, which are largely limited to the gray structures near the third and fourth ventricles and the aqueduct. Sections of the brain reveal, even macroscopically, the presence of hemorrhagic areas in the mammillary bodies, posterior corpora quadrigemina and thalami. The chief histologic changes are intimal proliferation of the small blood vessels, necroses, which may be accompanied with hemorrhage, and marked glial proliferation. Because there is no true inflammation, Spatz¹ expressed preference for the designation pseudo-encephalitis.

Two of Wernicke's original three patients were alcoholic addicts who were admitted in delirium. The subsequent patients with this syndrome whose cases were to be reported (Jacobäus) were all alcoholic addicts. Indeed, chronic alcoholism has come to be considered the basis of the condition.²

It is therefore interesting to recall that in Wernicke's first case (cited by Jacobäus³) there was no associated alcoholism:

The patient was a 20 year old seamstress who was dismissed from the Charité Jan. 6, 1877, after recovering from poisoning with sulfuric acid. Soon after she left the institution she started to vomit but otherwise remained well. However, from February 3 she was bedridden and strikingly sleepy; she yawned a great deal and reeled in walking. Her vision became impaired, and she suffered from dizziness and headache. February 11 there were some ptosis, impairment of external ocular movements and diminution of the pupillary light reflex. Moderate swelling of the optic disks and many retinal hemorrhages were observed. She became more sleepy and disoriented, sank into coma and died February 15. Necropsy revealed punctate hemorrhages in the vessel sheaths of the tissue lining the third ventricle, in the corpora quadrigemina and in the retinas.

In 1924 Tanaka⁴ observed the same histologic picture in association with an unusual condition which has been interpreted in Japan as "intoxication from mother's milk." That Wernicke's disease is found associated not only with misuse of alcohol and other exogenous intoxications but also with so-called endogenous intoxications was shown by Neubürger,⁵ who reported fourteen cases of the disease without alcoholism. He included ten cases of cancer, in seven of which the malignant growth was in the stomach. In most of Neubürger's cases vomiting and loss of weight were prominent signs.

Környey⁶ reported two cases in which the clinical and the histologic pictures were of Wernicke's disease but there was again no associated alcoholism. In his first case a Korsakoff psychosis started twenty days after gastric resection for cancer. In the second instance persistent vomiting occurred with recurrent carcinoma of the cervix.

In 1937 Neubürger⁷ reported three cases of chronic gastritis in elderly women with preterminal disturbance of consciousness and paralysis of the eye muscles. In these cases the anatomic lesions of Wernicke's disease were observed. It is noteworthy that in each instance the entire course of the disease was marked by striking and persistent vomiting. Neubürger considered intestinal autointoxication and nutritional deficiency in the etiology.

REPORT OF CASE

A white American woman, married, was examined in 1923. At that time fractional analysis after a test meal revealed 8 units of free hydrochloric acid in each of three specimens of gastric content. In 1929 there was no free hydrochloric acid in any of four specimens of gastric content after a test meal and x-ray examination of the stomach gave normal results. At this time cholecystectomy was performed.

She returned to the hospital at the age of 50, July 12, 1937, and said that for two years she had had indefinite irregular

3. Jacobäus, H.: Ueber einen Fall von Polioencephalitis haemorrhagica superior (Wernicke), Deutsche Ztschr. f. Nervenh. 5: 334-350 (July 19) 1894.

4. Tanaka, Toshiwo, cited by the Werthams.²
5. Neubürger, Karl: Ueber die nichtalkoholische Wernicke'sche Krankheit, insbesondere über ihr Vorkommen beim Krebsleiden, Virchows Arch. f. path. Anat. 298: 68-86 (Nov.) 1936.

6. Környey, S.: Wernicke-Korsakow-Prozess als Komplikation bösartiger extraneuraler Geschwülste, Deutsche Ztschr. f. Nervenh. 144: 241-260 (Oct. 25) 1937.

7. Neubürger, Karl: Wernicke'sche Krankheit bei chronischer Gastritis. Ein Beitrag zu den Beziehungen zwischen Magen und Gehirn, Ztschr. f. d. ges. Neurol. u. Psychiat. 160: 208-225 (Oct.) 1937.

From the Section on Neurology, the Mayo Clinic

1. Cited by Bumke, Oswald, and Kant, F.: Rausch- und Genussgifte: Giftsuchten, in Bumke, Oswald, and Foerster, O.: Handbuch der Neurologie, Berlin, Julius Springer, 1936, vol. 13, pp. 828-915.

2. Wertham, Frederic, and Wertham, Florence: The Brain as an Organ, New York, The Macmillan Company, 1934.

distress and pain in the upper right quadrant of the abdomen, together with eructations. Three months before registration, at the time of an automobile accident, she had been unconscious for a short period but had suffered neither fracture nor gross trauma. Since then she had been very nervous and the attacks of severe abdominal pain had occurred more frequently. Headache had been present for six weeks and daily vomiting for five weeks before registration.

Except for some tenderness in the right side of the abdomen and a pulse rate of 120 beats a minute, general physical examination, including ophthalmoscopic examination, gave negative results. The temperature was 98.4 F. The urinalysis and routine examinations of the blood gave essentially normal results (the hemoglobin content was 12.6 Gm. per hundred cubic centimeters, the erythrocytes numbered 4,160,000 and the leukocytes varied from 5,300 to 17,500 per cubic millimeter). There was no free hydrochloric acid in the gastric content. X-ray examinations of the chest, head and abdomen showed no abnormality. Examination of the blood for bromides gave negative results. The basal metabolic rate was +12 per cent. The blood urea content was 18 mg. per hundred cubic centimeters, the carbon dioxide combining power was 46.7 volumes per cent, and the serum sulfates amounted to 3.3 mg. and the serum bilirubin to 1.1 mg. per hundred cubic centimeters. The bromsulphalein liver function test showed maximal retention of the dye. The sedimentation rate was 62 mm. an hour. A careful examination of the central nervous system gave negative results objectively. However, the history suggested an anxiety state of several years' standing.

The patient's course in the hospital was marked by continual vomiting of the regurgitant type, which required the parenteral administration of salt solution and dextrose almost daily. Her pulse rate continued to vary between 110 and 120 beats a minute, even though her temperature remained normal and there was no evidence of hyperthyroidism. Although there was some tenderness in the right side of the abdomen, the leukocyte count was repeatedly normal. The determination of serum bilirubin was repeated and the content found to be 1.2 mg. per hundred cubic centimeters; the serum yielded an indirect van den Bergh reaction. Occasionally the patient became restless, slightly agitated and depressed because of her failure to improve. The ophthalmoscopic examination was repeated by Dr. H. P. Wagener and again reported as giving negative results. Some observers felt a mass in the right side of the abdomen.

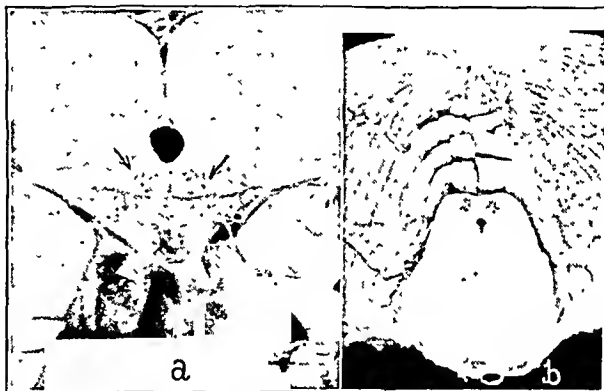
July 24 exploratory laparotomy, performed under regional anesthesia, revealed a loop of ileum which had become adherent to the site of the former right rectus incision. The pylorus and the first portion of the duodenum were adherent to the liver at the bed of the gallbladder. The rest of the exploration showed no abnormality and the adhesions were freed.

The first five days of the postoperative course were marked by much less vomiting than had occurred previously. The patient took about 2 liters of fluid a day by mouth. However, the afebrile tachycardia persisted.

July 29 the vomiting recurred and minimal fever (temperature, 99 F.) appeared. The fever recurred daily in the late afternoon and gradually increased. The pulse rate varied between 110 and 140 beats a minute. August 6 mental confusion and restlessness with continual movements of the lower limbs were observed. There was some loss of visual acuity. External ocular movements were limited in all directions, and the deep tendon reflexes were generally diminished to a slight degree. No other abnormality was found on neurologic examination, but the patient could not cooperate for a sensory examination. Dr. H. P. Wagener repeated the examination of the fundus and found a number of large hemorrhages in each retina around the margins of the optic disk and toward the macula. He found no definite edema of the optic disks. He considered the recent reduction of vision retrobulbar in origin and the entire picture suggestive of a deficiency of vitamins B and C. The blood urea amounted to 26 mg. and the blood chloride to 627 mg. per hundred cubic centimeters, the carbon dioxide combining power was 68 volumes per cent and the calcium content was 9.4 mg. per hundred cubic centimeters. Preparations of vitamin B, vitamin C and liver extract were administered intramuscularly, and parenteral injection of a solution of salt and dextrose was continued.

August 7 the spinal fluid was found to be clear and colorless. The pressure was 8 cm. of water and the protein content 45 mg. per hundred cubic centimeters. The Kolmer, Kline and colloidal gold tests were negative. There were 2 small lymphocytes per cubic millimeter. The patient's temperature ascended to 105 F. and the pulse rate to 170 beats a minute. Although the patient was comatose and breathing irregularly, her pupils reacted normally. The calves were tender. The tendon reflexes were diminished in the arms and absent in the legs. These observations were considered evidence of multiple peripheral neuritis. The parenteral administration of vitamins was continued, and a transfusion of 500 cc. of blood was given. August 8 the patient was moribund in coma. There was twitching of the facial muscles. Tenderness of the nerve trunks and of the calves was still present. The temperature remained high until death occurred August 9.

Necropsy was performed two hours after death. The brain weighed 1,080 Gm. and there was minimal atrophy of the cerebral convolutions. Petechial hemorrhages were present in the mammillary bodies (*a* in the illustration) and in the posterior corpora quadrigemina (*b*). Otherwise the brain, spinal cord and brachial and lumbosacral plexuses were normal macroscopically. There were also petechial hemorrhages in the skin over the arms and chest and in the lungs, as well as atrophy of the liver (which weighed 1,085 Gm.) and of the gastric and intestinal mucous membranes.



a, Frontal section at the level of the mammillary bodies, showing minute hemorrhages; *b*, transverse section of the inferior corpora quadrigemina, showing minute hemorrhages in the roof of the midbrain. (The lesions in the nuclei of the trochlear nerves are microscopic and are found below the aqueduct.)

Microscopic study of many areas of the brain and spinal cord revealed definite changes only in the mammillary bodies, posterior corpora quadrigemina and infundibulum. In these areas there were proliferative changes of the endothelial cells of the small vessels (marked by mitotic figures), considerable interstitial edema and small round hemorrhages, usually perivascular. The nerve cells were well preserved except in the nuclei of the nerves to the eye muscles, where there was advanced chromatolysis, and in the thalamus, where chromatolysis with satellitosis was present. In an occasional peripheral nerve (for example, from the brachial plexus) there was an area of demyelination, which contained scavenger cells. These areas represented noninflammatory degeneration.

The microscopic sections of the stomach, duodenum, jejunum and ileum revealed the mucosa to be only from a third to a half as thick as normal; thus the macroscopic impression of atrophy of the gastrointestinal mucosa was confirmed. There were moderate fatty change and slight passive congestion but no central necrosis in the liver. The microscopic picture was confirmed by Dr. J. W. Kernohan.

COMMENT

As a result of loss of essential secretions or of food, this patient undoubtedly suffered from a deficiency state which was exacerbated by the chronic atrophy of the gastrointestinal mucous membrane.⁸ It is likely

8. Wilbur, D. L., and Snell, A. M.: Deficiency States Associated with Gastro-Intestinal Disease. *Am. J. Digest. Dis. & Nutrition* 4: 720-728 (Jan.) 1938.

that the retention of dye and the fatty change in the liver resulted from a vitamin deficiency.⁹ The persistently rapid heart rate in the absence of fever or hyperthyroidism is common in cases of vitamin B deficiency.¹⁰ The relation of the retinal hemorrhages to a deficiency in nutrition and particularly to a deficiency in vitamins has been amply demonstrated.¹¹ Furthermore, the patient presented all the clinical and anatomic characteristics of Wernicke's disease. Finally, the lesions of Wernicke's disease are said to have been produced experimentally by the administration of a diet deficient in vitamins.¹² It is suggested that a deficiency of nutrition, probably of vitamins, underlies Wernicke's disease in all cases. Large doses of vitamins B and C have effected a cure of this condition in some of our cases.

SYPHILIS

WITH SPECIAL REFERENCE TO THE INCIDENCE IN
RELATIONSHIP TO AGE GROUPS AND STATUS
OF THERAPY AT THE DATE OF INFECTION

G. H. HANSMANN, M.D.

MILWAUKEE

The recent prevalence of syphilis as claimed by the propaganda arising from the United States Public Health Service was outright astounding to me. During twenty-four years of endeavor as a medical student and worker in laboratory medicine, in the course of which time thousands of postmortem examinations, examinations of surgical specimens and serum tests for syphilis were both accomplished personally and personally directed, I have witnessed syphilis in four sections of the country dwindle from a common experience with full blown active lesions to an occasional positive serologic test, a few scars of the aorta, a rare scarred liver presumably syphilitic, a slightly more frequent syphilis scarred central nervous system, and about twice a year an actual case of congenital syphilis.

I had not insisted on a routine serologic test for syphilis because syphilis rarely was evident at postmortem and surgical specimen examinations, in the run of clinical cases, in serologic tests on prospective donors for blood transfusions, in cases in which a test happened to be made on available excess serum obtained for other purposes, and in tests done on actual syphilis suspects. The fear naturally arose that even though I thought that I had given due consideration to syphilis I may not have been thorough enough and that many cases had escaped notice because routine tests were not made.

I have therefore felt obligated to find a way to check more accurately the standard of medical practice in Milwaukee with particular reference to syphilis, in the interest of establishing a base line so that a determination might be made of what really has been accomplished in the quiet, inexpensive, determined, unobtrusive way characteristic of the dignity of the

best medical practice, and what has been left for the more vigorous programs recently inaugurated to accomplish.

The objective of fair sampling requires cognizance and avoidance of pitfalls commonly inherent in statistics. Swivel chair statistics, in which the percentage of syphilis was based on the number of positive serologic tests without possession of information as to the number of individuals and consequences of the lesions represented, were eliminated. The subjects were observed in a manner which did not overemphasize the prevalence of syphilis. The figures should represent recent transmission of syphilis and not be burdened by cases in which infection may have been acquired even before the discovery of the spirochete, the advent of arsenical and bismuth treatments, and the application of serologic tests for syphilis. I believe that the plan adopted has adequately eliminated all such sources of error.

I was fortunate in having the Milwaukee Children's Hospital patients as the source of the serums. Children up to 12 years of age are cared for at the institution. Mothers with recently acquired, not adequately treated, syphilis should transfer the disease to their offspring in a high percentage of cases. The study, therefore, should be not only an index of congenital syphilis but an index of syphilis sufficiently active to be hazardous to the public in the parents of the group represented. All samples of blood were taken and tested by the laboratory personnel. All records were maintained within the laboratory. A rapid exclusion test, too delicate for diagnosis, was used to exclude negative cases. All serums of positive nature, regardless of degree, were subjected to two or more additional serologic tests at Columbia Hospital and the serologic laboratory of the Wisconsin Psychiatric Institute at Madison. All patients entering the outdoor department or hospital with the exception of a few private patients were tested. In the advent of a positive serologic test for syphilis, the entire family was investigated as far as this was possible. The cases of syphilis encountered in a family study could not rightfully be included in the statistical figure of current incidence of syphilis, since they were not seen in the regular run of cases. Only the initial case in the family was included in the statistics. The rigidly controlled plan has eliminated all possibility of the rather common practice of sending in a number of serums on the same patient under various names after obtaining a positive test. The hospital has no syphilis clinic to distort the figures of incidence. The hospital is a charitable institution and cares primarily for the children of the poor and low income families of Milwaukee. As far as there is anything to the fact that the low income group obtains inadequate medical care, the figures are probably too high. Facilities were not available to compensate for this error.

The incidence of syphilis in persons under 12 years of age indicated in table 1 would place the number of children who most likely have syphilis at 369 of Milwaukee's 123,000 children. Of these, forty have the untoward anatomic stigmas of syphilis, eighty have skeletal changes which may be determined radiologically, while 289 have only a positive serologic test to support the diagnosis of syphilis.

There were two instances in which both parents were negative to the serologic tests. The parents of one of the children had a history of syphilis, the mother

9. Snell, A. M.: Personal communication to the authors.
10. Weiss, Soma, and Wilkins, R. W.: The Nature of the Cardiovascular Disturbances in Vitamin Deficiency States, *Tr. A. Am. Physicians* 51: 341-373, 1936.

11. Wagener, H. P., and Weir, J. F.: Ocular Lesions Associated with Postoperative and Gestational Nutritional Deficiency, *Am. J. Ophth.* 20: 253-259 (March) 1937.

12. Alexander, Leo; Myerson, Abraham, and Pijoan, Michel: Beri-Beri and Scurvy: An Experimental Study, *Tr. Am. Neurol. A., Program of the Sixty-Fourth Annual Meeting*, May 2-4, 1938, pp. 25-26.
From the Milwaukee Children's and Columbia hospitals.

received antisyphilitic treatment during the final months of the gestation, and arsenic determinations on the hair indicated that the hair of the infant contained slightly more arsenic than that of the mother. At the time of the study, both parents and child had negative serums, but the child had x-ray evidence of skeletal syphilis. The parents in the second case had no history of syphilis, and the four other children had negative serums. It is not my purpose here to discuss the requirements for an accurate diagnosis of syphilis. Whether one likes it or detests it, a positive serologic test for syphilis is usually taken as a signal to turn on the spigots of antisyphilitic therapy. When one views the marked divergence between positive tests and morphologic evidences of syphilis as studied clinically, radiologically and at the postmortem table, thorough medical men must often wonder whether we do not have too implicit faith in a positive serologic test for syphilis. Certainly a child with only a positive test, with parents and four other children negative in all particulars, should raise the question of the requirements of an accurate diagnosis and proper therapeutic regimen.

If the expenditure of getting in touch with the patient, obtaining the blood, performing the test, recording the information and disseminating the information to proper authorities is fixed at \$1.50 per test, it costs \$712.50 in Milwaukee to make a positive serologic diagnosis of syphilis in children by the routine test method.

Assuming that the mothers who transmitted syphilis to their offspring represent the clinically active cases of syphilis and that the usual spread of three positive serologic tests to one clinically active case prevails, the incidence of probable syphilis in this 35 year age group would be 1.2 per cent. As donors for blood transfusions for their children, 210 mothers presented themselves in a routine manner. Three of these had positive Kline

pancreatitis, but the spirochete could not be demonstrated in the pancreas, liver or adrenals by the various staining methods. Consequently, this case remains very much in doubt.

The ages of the patients in table 3 who showed evidences of syphilis varied between 46 and 76. The average age was 60. If the likelihood is assumed that

TABLE 2.—*Postmortem and Surgical Specimen Examinations for Syphilis on Children Under Twelve from Sept. 1, 1935, to Jan. 1, 1939*

Surgical specimens examined..	383	Syphilis diagnosed	none
Postmortem examinations made	221	Syphilis diagnosed	1 doubtful case

TABLE 3.—*Postmortem and Surgical Specimen Examinations for Syphilis on Adult Patients Between Jan. 1, 1936, and Jan. 1, 1939*

Surgical specimens examined..	4,012	Syphilis diagnosed	.....	1
Postmortem examinations made	178	Syphilis diagnosed	.....	8

these patients acquired their syphilis at the average age of 25, the management of their disease will represent the medical practice of 1903, a date which antedates the discovery of the spirochete, the Wassermann reaction or important antisyphilitic treatment other than mercury.

Even here in only one of the eight cases did syphilis operate as the major cause of death. In fact, this patient was the only one who presented a progressive syphilitic lesion: a meningovascular syphilis with occlusion of a vessel in the pons. Two patients were somewhat disabled by aneurysms of moderate size. Two patients had evidence of old quiescent tabes, one of whom was included in the aforementioned aneurysms. Another disabling scar was a syphilitic periostitis. The final patient had quiescent gummatous scars of the liver and a syphilitic cirrhosis. In two bodies, small aortic scars were found at postmortem examination. In one body, even though forewarned of a positive serologic reaction, I was unable to find a lesion of syphilis at postmortem examination. Fortunately for the patients and with no hazard to the public, six of the patients were not under active treatment. The lesions of syphilis in these cases were at an irreducible residuum. The patient with the syphilitic periostitis may still receive some benefit from treatment. One patient was inadvertently injured seriously by the treatment. Active treatment of the patient with the meningovascular syphilis most likely would have averted death. Six of the nine would have benefited by treatment before the disabling lesions developed. It seems self evident that when these elderly persons who contracted their syphilis from thirty to forty years ago drop out of the picture there will be an appreciable spontaneous drop in the incidence of syphilis.

Eight patients of the 178 in the 60 year average age group had either scars of syphilis or a positive Wassermann reaction. Five of these had clinically recognized syphilis. This would indicate that, in 3 per cent of the population of Milwaukee in this age group, evidence of active or latent syphilis could be identified on careful physical examinations. If we calculate those who have demonstrable syphilis and those who have only positive serologic tests on the basis of the usual spread of a

TABLE 1.—*Clinical, Serologic and Radiologic Data on Children and Parents Studied*

Number of serologic tests	..	3,800
Number of children studied	...	3,018
Children with positive tests..		8
Number recognized clinically...		1
Number diagnosed by x-ray examination	..	2
Percentage indicated serologically		0.27
Percentage indicated clinically	..	0.03
Percentage indicated radiologically	..	0.06
Percentage indicated by one or more methods.		0.3
Number of parent suspects available for test		13
Number of parent suspects positive serologically		8
Percentage of available parents positive...	..	61
One or other parent positive.....		5
Percentage of one or other parent positive	.....	70
Both parents negative.....		2
Number of other children in suspected families available for test	..	9
Number positive		2
Percentage of mothers with syphilitic activity sufficient to transmit syphilis during a full period of gestation	..	0.3

tests, an incidence of 1.4 per cent. The average incidence from the two sources of information would be 1.3 per cent. This would represent the adequacy of medical practice of about ten years ago if we put the average age at 25 for acquired syphilis.

The clinical information on the doubtful case in table 2 was that of an anemic, very ill child with a positive Kline test. Neither parent had a history of syphilis or a history of treatment, and both had negative serums. Postmortem examination added a chronic

recognizable clinical case to three with positive serologic tests, the incidence in this age group would be 12 per cent.

The protean manifestations of syphilis are summed up well in the old dictum "To know syphilis is to know medicine." We must bear in mind that this dictum has inherent the proposition that a person who has a positive serologic test may be actually or concurrently suffering from any of the other diseases which may be interpreted as syphilis because of a positive serologic test. Experience at postmortem examination has taught me that, if the brain, cardiovascular system, liver, hematopoietic organs or kidney are vulnerable or actually diseased, the consequences of antisyphilitic treatment are too often grave. Antisyphilitic treatment is therefore not to be undertaken lightly. It should be an individual problem undertaken only under the most intimate medical supervision. The social consequences of the patient's disease, how much the patient is likely to benefit from the treatment, and actual disease and functional status of the organs named should all be taken into consideration. Close observation for inadvertent consequences is also imperative. An accurate diagnosis of syphilis is here assumed.

This actual study of syphilis was made at Iowa City, Boston, Iowa City, Washington, D. C., and Milwaukee in order of service. The study represents the period between 1916 and the present. In order of decreasing incidence of syphilis, the arrangement is Washington, Iowa City, Boston and Milwaukee. The factors responsible for the situation in a given locality seemed to be the alertness of the profession, the adequacy of consideration for care of the indigent, and the cooperation of the patient. The importance of the alertness of the medical profession, which is always coupled with willingness to serve, has been outstanding. It should be pointed out that the District of Columbia is largely dependent on the federal government for appropriations for the care of the indigent. Curiously enough, here is also the home of the United States Public Health Service.

SUMMARY AND CONCLUSIONS

1. Syphilis was studied in the various age groups in Milwaukee with special reference to incidence and the consequences of the disease as well as the relationship of the incidence to the development of means for recognition and treatment of the condition.

2. Dependence was placed on routine admissions, presentation of parents for blood transfusions, and postmortem examinations for reliable sampling of the public in the study.

3. The high incidence of syphilis which prevails in the age group who acquired their syphilis before the advent of the discovery of the spirochete, the development of important arsenic and bismuth preparations and the knowledge of the serologic tests indicates that the groundwork has been laid for an imminent spontaneous fall in the incidence of syphilis.

4. The incidence of syphilis varies from one locality to another, depending on the alertness of the profession, the cooperation of the patient and provisions for the care of the indigent named in the order of their importance.

5. There can be no intelligent discussion of syphilis on the basis of the number of serologic tests per thousand of population. The least information for an intelligent discussion would appear to be the number of individuals represented by the tests per given area, the personal and the economic consequences of the disease,

what the therapy has to offer the individual, and the functional and anatomic integrity of the body resulting from causes other than syphilis and the inadvertent serious consequences of the treatment.

6. In the postmortem examinations made, in all but one the morbid anatomy of syphilis was at an irreducible residuum.

721 North Seventeenth Street.

PAROVARIAN CYSTS COMPLICATING PREGNANCY

REPORT OF CASE CAUSING DYSTOCIA:
REVIEW OF LITERATURE

WENDELL DOWNING, M.D.

AND

LAWRENCE O'TOOLE, M.D.

LE MARS, IOWA

Dystocia caused by a parovarian cyst is of rare occurrence. A review of the literature since 1873 shows only sixty-two¹ reports of parovarian cysts complicating all stages of pregnancy and in only seven cases did the cyst produce dystocia. This paper includes a summary of all the cases complicating pregnancy that have been reported since 1873. No such analysis has been made previously. The study was prompted by a recent case in which a parovarian cyst produced a pelvic block and required aspiration of the cyst to permit delivery of the fetus.

Ovarian cysts and solid tumors, such as myomas, may also cause pelvic block and dystocia. The solid tumors can usually be differentiated from cysts, but the differential diagnosis of ovarian from parovarian cysts is often impossible during pregnancy and labor. Voza² in a review from his own clinic of 108 cases of cysts complicating pregnancy found that twenty-seven cases (24 per cent) were of parovarian origin, twenty-nine cases (26 per cent) were dermoids and in fifty-two cases the cyst originated in one or the other ovary, being bilateral in 4.5 per cent.

EMBRYOLOGY

The parovarium represents a remnant of the sexual portion of the wolffian body in the female and is a homologue of the epididymis in the male. It lies in the connective tissue of the broad ligament near the fallopian tube and consists of a main collecting channel, running close and parallel with the tube, together with from ten to eighteen small perpendicular ducts projecting toward the hilus of the ovary. Cystic dilatations of the blind end of the main channel are frequent and produce the hydatids of Morgagni, which have no clinical significance. Parovarian cysts, which

From the Le Mars Clinic.

Dr. Jeannette D. Throckmorton of the Iowa State Medical Library prepared our bibliography and aided in securing the case reports from her own and the Surgeon General's Library, and Drs. Poble and Carnazzo of Le Mars translated the French and Italian reports.

1. After this paper had been prepared, Dr. Throckmorton accidentally found the following report of a case which is not listed in any of the indexes: A tertipara in premature (?) labor presented a mass the size of a fist in the culdesac; torsion and gangrene were present. Cesarean section was performed and a cyst was removed from the broad ligament on the left side. The mother recovered, but no mention was made of the fetus. The patient had complained of constipation during pregnancy and severe pain in the left iliac quadrant after the fifth month (Johnstone: Broad Ligament Cyst with Twisted Pedicle Which Obstructed Labor. *Spectator*, Tr. Edinburgh Obst. Soc. 85: 25, 1925-1926; Edinburgh M. J. 33: 25-26 [Feb.] 1926).

2. Voza, F.: Evolution of Ovarian and Parovarian Tumors During Different Periods of Pregnancy: Brief Report of 109 Clinical Cases. *Ann. di ostet. e ginec.* 54: 889-1073 (July 31) 1932.

TABLE 1.—Summary of Twenty-Six Cases of Parovarian Cysts Complicating Pregnancy Reported by Vozza²

Case	Previous Pregnancies	Month of Pregnancy	Condition Found	Complications	Intervention	Maternal Results	Progress of Pregnancy	Observations
1	None	4th	Left cyst; 8 liters	None	Cyst emptied and removed	Cure	Normal course	Rapid growth of cyst with onset of pregnancy
2	One	2d	Left cyst, size large orange	Torsion of pedicle; intra-cystic hemorrhage	Removal	Cure	Normal course	No symptoms; accidental finding of tumor by patient; rapid growth during pregnancy
3	Four, three abortions	3d	Pedunculated light cyst size of fetal head at term	None	Removal	Cure	Normal course	Uterus retroverted; pernicious vomiting ceased after removal of cyst
4	None	3d	Right cyst; 3 liters sero purulent fluid	Suppuration; few perleystic adhesions	Removal	Cure	Aborted 5th postoperative day	Acute onset of fever; pain; diagnosis of cyst with torsion
5	Two	2d	Right cyst; 2 liters fluid	Torsion of pedicle, intra-cystic hemorrhage	Removal of cyst with adenoma	Cure	Normal course	Asymptomatic torsion, cyst anterior to uterus; displaced posteriorly
6	None	4th	Left cyst size of 7 month fetal head	None	Removal of cyst deep in pelvis posterior to uterus	Cure	Normal course	Severe constipation
7	None	8th	Right cyst, suppurating, size of fetal head at term	Suppuration of cyst in puerperium	Sac emptied and marsupialized	Cure	Spontaneous delivery of infant; died 2 days later	Pregnancy normal save for premature labor in 8th month
8	Three	Puerperium	Multiple cysts size of 8 month pregnancy	None	Removal 7th day of puerperium	Cure	Spontaneous premature labor	No disturbance in spite of size of abdomen; labor 8th month; forceps
9	Two	3d	Left cyst; 7 liters watery fluid	None	Removal following aspiration	Cure	Normal course	Cyst present prior to pregnancy; rapid growth with pregnancy
10	One abortion	2d	Right cyst; very thin wall	Torsion of pedicle, adhesions	Removal	Cure	Normal course	Torsion probable before pregnancy; tumor in left lower quadrant
11	None	Puerperium	Right cyst; 3 liters, hemorrhage and necrosis of wall	Torsion	Aspiration followed by removal	Cure	Operation in puerperium	Normal delivery; returned because of large abdomen
12	None	3d	Right cyst size of 8 month fetal head	None	Removal	Cure	Normal course	No developments
13	None	3d	Cyst size of orange	None	Removal	Cure	Normal course	Accidental finding of tumor by patient
14	None	2d	Cyst with two compartments	None	Removal, correction of retroflexion	Cure	Abortion 6th postoperative day	Preexisting threatened abortion
15	None	2d	Left cyst size of orange	None	Removal	Cure	Normal course	No disturbance
16	None	4th	Left cyst size of 7 month fetal head	None	Removal	Cure	Normal course	Some abdominal pain
17	Two, one abortion	3d	Size of fetal head at term	None	Removal	Cure	Normal	No subjective symptoms
18	One, one abortion	1st	Left cyst size of full term pregnancy	None	Removal	Cure	Normal	Spotting of blood after missing one menstruation
19	One, one abortion	2d	Left cyst; 7 liters of fluid	None	Removal after aspiration	Cure	Normal	Rapid growth during pregnancy
20	One	Term	Left cyst size of fetal head at term	None	Cesarean removal of cyst	Cure	Living baby	No important symptoms
21	One	3d	Left cyst size of 7 month pregnancy	None	Aspiration and removal of cyst	Cure	Normal	Rapid growth during pregnancy
22	None	Term	Left cyst size of fetal head at term	None	Cesarean removal of cyst	Cure	Live baby	Symptoms of abdominal pain
23	Three	2d	Left cyst size of adult head, cyst of right ovary	None	Removal of cyst and ovary, correct retro flexion	Cure	Abortion 8th day	Cyst accidentally found on examination
24	Two	2d	Right cyst size of fist	None	Removal	Cure	Normal	Cyst found on routine examination
25	One	2d	Left cyst size of fetal head	Torsion	Removal	Cure	Normal	Obstinate vomiting
26	None	3d	Right cyst size of orange	None	Removal	Cure	Normal	Rapid growth during pregnancy

were first mentioned by Velpeau in 1825, are regarded as resulting from retention of abnormal secretions of the epithelial lining of the parovarium.

PATHOLOGY

Parovarian cysts are usually single and unilocular and may be of any size. Rutherford³ reports one case in which there were three cysts ranging in size from

that of a pigeon egg to that of a duck egg. The cysts are always extraperitoneal or intraligamentary, and the tube lies stretched out over the superior surface of the cyst. A pedicle is not common but one may develop if the cyst grows intra-abdominally; the peritoneal layers of the broad ligament, the tube, the utero-ovarian ligament and even the ovary may be contained in the pedicle. A pedicle was present in seventeen of the sixty-two cases studied in this report.

3. Rutherford, R. Abortion with Broad Ligament Cysts and Bacillus Welchii Infection, Brit. M. J. 1:173 (Jan. 22) 1938.

The cysts are usually pearly gray or pink with thin walls, with the peritoneal layers of the broad ligament freely movable over them owing to their subserous location. The inner surface of the cyst is smooth and glistening, but low papillae may be seen. The fluid is clear and serous and faintly alkaline and contains practically no mucin or pseudomucin. The fluid may be turbid, owing to degeneration and the presence of blood; it is innocuous and suppuration is rare. Dermoid cysts may be found in the broad ligament.⁴ Ehrenberg⁵ has recently reported an extraperitoneal epidermoid cyst containing sebaceous material producing dystocia at term.

4. Cases 1 to 14 inclusive in table 1.
5. Ehrenberg, C. J.: Epidermoid Cyst Causing Dystocia: Case, Journal-Lancet 58: 149 (March) 1938.

Microscopically the cyst wall is made up of connective tissue with some smooth muscle and elastic tissue and is lined with a single layer of ciliated epithelium. Malignant change is very rare. Surrounding the cyst is the connective tissue of the broad ligament and within it are the blood vessels of the cyst, which are separate from those of the peritoneum.

CLINICAL

The clinical signs and symptoms depend on the location and size of the cyst. They grow slowly and are usually incarcerated in the broad ligament, thus displacing the uterus and causing more pressure on the blood vessels, nerves and ureters than ovarian cysts. They are rarely a factor in sterility, since the ovaries are normal. During pregnancy the enlarging uterus is

TABLE 2.—Summary of Cases of Parovarian Cysts Complicating Pregnancy Reported by Other Authors

Case	Author	Previous Pregnancies	Month of Pregnancy	Condition Found	Complications	Intervention	Maternal Results	Progress of Pregnancy	Observations
27	Trillat, P.: Broad Ligament, Parovarian Cyst as Cause of Dystocia in 3 Consecutive Pregnancies: Case, Bull. Soc. d'obst. et de gynéc. 22: 429-430 (May) 1933	None One Two	Term Term Term	Cyst in culdesac Cyst in culdesac Cyst in culdesac	None None None	Vagina aspirated Vagina aspirated Vagina aspirated	Cure Cure Cure	Normal Normal Normal	Three successive pregnancies aspirated at term; operation refused
28	Michel, G., and Vermelin, H.: Parovarian Cyst with Torsion of Fallopian Tube in Ninth Month of Pregnancy: Case, Bull. Soc. d'obst. et de gynéc. 17: 159 (Feb.) 1928	None	9th	Right cyst size of orange	Acute torsion	Removal of cyst	Cure	Normal	No symptoms previous to torsion
29	Davidson ⁷	Five	In labor at term	Cyst in culdesac size of grapefruit	None	Cesarean, cyst not removed	Cure	Normal	Head displaced out of pelvis
30	Hammond, L. J.: Broad Ligament Cyst of Large Size Occurring During the Course of Pregnancy: Its Removal Five Weeks After Delivery, Am. M. 10, 1903	One	Entire pregnancy	Right cyst out of pelvis	None	Removal during puerperium	Cure	Normal	Cyst grew to large size during pregnancy
31	Kahn, M.: Removal of Ovarian Cyst, Broad Ligament Cyst and Appendix at the Second Month of Pregnancy: Delivery at Term, Am. M. 2: 108, 1901	No data	2d	Small cysts	None	Removal	Cure	Normal	No symptoms
32	Wilson, K. M.: Ovarian and Parovarian Cysts in Pregnancy, Am. J. Obst. & Gynec. 34: 977 (Dec.) 1937	No data	7th	No data	None	Removal	Cure	Normal	
33		No data	3d	No data	Torsion	Removal	Cure	Normal	
34		No data	2d	No data	Torsion	Removal	Cure	Normal	
35		No data	7 wks.	No data	Torsion	Removal	Cure	Normal	
36		No data	No data	Cyst in abdomen	None	Removal	Cure	Normal	
37	Zimmerman, B. F.: Large Intraligamentous Cyst Complicating Pregnancy: Operation, Recovery, Internat. Clin. 30: 202-204, 1920	2d	During pregnancy	Abdominal location	None	Aspirated 10 days post partum; 14 liters	Cure	Normal	Cyst removed 1 month after delivery
38	Spencer, Herbert: Tumors Complicating Pregnancy, Labor and the Puerperium, Lancet 1: 411-418 (Feb. 21), 475-481 (Feb. 28), 529-535 (March 6) 1920	One	Diagnosis before pregnancy	Left cyst	None	Removal postpartum, 4 liters	Cure	Normal	Slow growth during pregnancy
39		One	3d	Right cyst 9 by 6 cm.	None	Removal	Cure	Normal	No symptoms
40		Two	3d	Right cyst size of emu's egg	Torsion	Removal	Cure	Aborted	
41		No data	No data	Right cyst 6 by 5 cm.	None	Removal 4 mn. after labor	Cure	Normal	Difficult forceps
42		No data	No data	Right cyst size of two fists	None	Removal after delivery	Cure	Normal	Forceps, version
43	Grosse, A.: Volumineux kyste du ligament large et grasse; ablation du kyste; continuation de la grossesse, Gaz. med. de Nantes, 31: 948-950, 1913	None	6th	Left above uterus	Acute torsion	Removal 6th month, 8 liters	Cure	Normal	
44	Vanverts, M. J.: Torsion of Cyst of Broad Ligament During Pregnancy, Bull. Soc. d'obst. et de gynéc. 15: 580 (Nov.) 1926	Five	6 wks.	Right cyst size of pea	Torsion	Removal of cyst, tube and ovary	Cure	Normal	Cyst in right ovary
45	Michel, G., and Guibal, J.: Broad Ligament-Torsion of Parovarian Cyst During Postpartum Period: Operation, recovery, Bull. Soc. d'obst. et de gynéc. 17: 159 (Feb.) 1928	No data	No data	Left cyst size of orange	Acute torsion	Removal of cyst and tube 15 days post partum	Cure	Normal	Torsion 15 days post partum
46	Fruhshniz, A., and Hamant, A.: A propos de quelques kystes ovariques de la gestation, Bull. Soc. d'obst. et de gynéc. 17: 160-163 (Feb.) 1928	None	3d	Culdesac displacing uterus	None	Aspiration of liter	Cure	Normal	
47	Nash, W. G.: Torsion of Parovarian Cyst During Pregnancy, Proc. Roy. Soc. Med., London, 1908-1909; Ill. Obst. and Gynec. Sect. 224	None	3d	Left and posterior in uterus	Torsion	Removal, size of enchanut	Cure	Normal	
48	Kreutzmann, H. J.: A Case of Extraperitoneal Intraligamentous Dermoid Cyst and Pregnancy, California State J. Med. 12: 194 (May) 1914	One	4th	Left and posterior in dermoid cyst	None	Removal	Cure	Normal	

TABLE 2—Summary of Cases of Parovarian Cysts Complicating Pregnancy Reported by Other Authors—Continued

Case	Author	Previous Preg- nancies	Month of Pregnancy	Condition Found	Complica- tions	Inter- vention	Maternal Results	Progress of Preg- nancy	Observations
49	Lund, F. B.: A Case of Parovarian Cyst with a Twist of the Pedicle Occurring During the Fourth Month of Pregnancy. Operation, Recovery, Normal Delivery at Term, Boston M. & S. J., 1900, pp 143-208	Two	4th	Right cyst in culdesac	None	Removal, size of 3 month pregnancy	Cure	Normal	
50	Toogood, F. S.: Case of Pregnancy Complicated with a Parovarian Cyst Simulating Extra Uterine Gestation, Brit. M. J., 1:1144, 1896, Lancet 1: 1351, 1896	None	4th	Culdesac displacing uterus	None	Removal, size of cocoonut	Cure	Normal	
51	Bohin, J.: Unusually Large Parovarian Cyst Complicating Pregnancy, Gynécogazat 70:223-224 (March 23) 1930	No data	4th	Abdomen enlarged, ascites	None	Removal	Cure	Aborted	Offensive vaginal discharge
52	Flurenberg	None	9th	Recto-rectal mass displacing head	None	Aspiration of serous material	Cure	Normal	Epidermoid cyst; low forceps
53	Manzi, L.: Cisti ovarica interligamentosa ineuata nel bacino, ostacolo al parto. Minaccia di rottura di inserta, taglio cesareo demolitore, guarigione, Rassegna d'obst. e ginec. 37:434-432 (July 21) 1928	None	9th in labor	Mass in culdesac displacing head, uterine rupture impending	None	Cesarean, hysterectomy, removal of cyst	Cure	Normal	Premature separation of placenta
54	Qui, M.: Grossesse compliquée, l'une de kyste du parov. l'autre de kyste de l'ovaire, Rev. prat. d'obst. et de pèdiat. 289-293, 1911	Three	5th	Abdominal and pelvic tumor, 10 liters	None	Removal after aspiration	Cure	Normal	
55	Hartman, H.: Kyste du ligament large a pedicule tordu et grossesse, opération a 2 mois. guérison accouchement à terme, Ann. de gynéc. et d'obst. Paris 69:453-456, 1903	None	2d	Right cyst in culdesac	None	Removal, 1 liter of fluid	Cure	Normal	
56	Lantuejoul and Reglade: Rupture spontanée d'un kyste du parovaire pendant la grossesse, Gynecologie 23:540, 1924	Three	6th	Right cyst	None	Removal 5 months post partum	Cure	Normal	Cyst disappeared during pregnancy; no symptoms; spontaneous rupture
57	Begoun and Lafargue: Kyste du parovaire et grossesse, opération, Bull. Soc. d'obst. et de gynéc. 12:88, 1923	Two	4th	Pedunculated mass near navel, uterus retroflexed and fixed	None	Removal, size of two fists, uterus replaced	Cure	Aborted	
58	Pery and Mamge: Kyste du parovaire et retroflexion de l'utérus gravid, Bull. Soc. d'obst. et de gynéc. 12:231, 1923	None	Before pregnancy	Large cyst in abdomen and pelvis	None	Removal 3d month of pregnancy	Cure	Normal	
59	Rutherford	Three	2d	Sepsis, vaginal bleeding, tender in left lower quadrant	Torsion	Removal of 3 cysts, pigeon to duck egg size	Cure	Aborted	Mother developed B. Welchii peritonitis and pelvic abscess
60	Huter, F.: Grossesse et tumeur kystique intra-ligamentaire, Bull. Soc. d'obst. et de gynéc. 10:369-371, 1921	One	Before pregnancy and again in 6th month	Cyst on right above uterus size of man's head	None	Removal of pedunculated cyst at 7th month	Cure	Normal	
61	Reeb, M.: Dystocie provoquée par un kyste du parovaire, Bull. Soc. d'obst. et de gynéc. 10:444, 1921	None	Term, in labor	Cyst on left and in culdesac size of fetal head	Dystocia	Cesarean, suppurating cyst, ruptured in removal, hysterectomy	Cure		Viable child, no symptoms during pregnancy
62	Downing and O'Toole	Three	Term, in labor	Mass in culdesac displacing head, uterine rupture impending	None	Aspiration per vagina, 350 cc; spontaneous delivery	Cure		No disturbance of pregnancy; cyst removed 10 days post partum, 500 cc

usually forced up and out of the pelvis to the side opposite that of the cyst. Pain in the back or sides and bladder symptoms are common. At term the cyst may cause dystocia first by causing an abnormal presentation, second by acting as an insuperable obstacle to the passage of the fetus through the pelvis, and third by producing a rupture of the uterus. A pedunculated cyst may be located in any position in the abdomen and not cause symptoms, being only accidentally discovered by the patient or her physician.

COMPLICATIONS

Torsion and gangrene of parovarian cysts are common in pregnancy when the cyst has a pedicle, and

several such cases⁶ have been reported. Gangrene may also result from prolonged pressure during labor. Torsion may develop at any period, but it is most common in the early months of pregnancy and in the puerperium. Torsion was a complication necessitating operation in fifteen of the sixty-two cases reported. Rupture of the cyst may occur as a result of compression by the uterus and fetal head or of degenerative changes in the cyst wall. Intracystic hemorrhage and suppuration are other less common complications. Premature separation of the normally implanted placenta has been reported in a case of parovarian cyst.

⁶ Cases 2, 9, and 11 in table 1.

DIAGNOSIS

The differential diagnosis of parovarian from ovarian cysts during pregnancy is usually not possible, and the treatment is in general the same. Occasionally the parovarian cyst and the ovary can be felt separately and thus differentiated. Parovarian cysts are usually lower in the pelvis and are more fixed than those of ovarian nature. A tense cyst and a fibroid softened by pregnancy may at times be difficult to differentiate.

THERAPY

The indications for treatment of cysts encountered during pregnancy vary with the period of pregnancy and the size and location of the cyst. If a diagnosis of parovarian cyst is made in a patient seen during the first half of pregnancy, the cyst should be removed as early as possible if it is large, particularly if it is situated low in the pelvis and is not movable. If it is small, the patient may be kept under close observation and if it does not enlarge its removal may be postponed until after the termination of the pregnancy. Torsion of the cyst, however, may occur at any stage of pregnancy and necessitate an immediate operation.

During the second half of pregnancy the cyst, if large and fixed in the pelvis, should be removed at once; if small and not incarcerated, the patient may be watched closely and operation may be delayed at least until the fetus becomes viable. A study of the sixty-two cases in this report indicates that in the majority of patients the cyst enlarges, often rapidly, during pregnancy.

If a parovarian cyst is not diagnosed until labor is imminent or in progress, several procedures are possible: First, an attempt should not be made to do a forceful delivery alongside the cyst if it is large and prevents the fetal head from entering the pelvis. Second, reposition of the cyst under anesthesia with the patient in the Trendelenburg position may be attempted. If the cyst originates in the broad ligament with no pedicle this will rarely be possible, but it may be successful if it is of ovarian origin. Third, if the cyst is incarcerated in the pelvis it may be aspirated through the posterior vaginal wall, a blunt needle being introduced close to the posterior edge of the cervix in the median line. Davidson⁷ reports a case in which he was able to palpate the uterine vessels on the vaginal aspect of the cyst. During the puerperium the cyst should be removed by laparotomy, since the flabby cyst is apt to undergo torsion if it has a pedicle. In suitable cases in which aspiration is not advisable because of the danger of injuring the vessels or ureter or because of the inaccessibility of the cyst, a cesarean section should be performed, followed by extirpation of the cyst when the condition of the patient permits. A few authors advise against treatment by aspiration, but that procedure is much safer than section in most hands and it seems to us that it is the method of choice when the cyst is incarcerated below the uterus. The removal of the cyst following cesarean section is often difficult if it is deep in the broad ligament or if an inflammatory reaction is present. In an occasional case in which infection of the cyst or uterus is present, a total hysterectomy is indicated following the cesarean section.

Judging from the results obtained in the cases reported, abortion or premature labor rarely results from laparotomy and removal of the parovarian cyst,

even when torsion necessitates an immediate operation. The most favorable period during pregnancy for intervention seems to be the fourth month. Complications, such as torsion, hemorrhage, suppuration or rupture, developing in cysts during pregnancy call for immediate operation, no matter what the period of pregnancy or puerperium.

REPORT OF CASE

Mrs. G. M. aged 28, a quartipara, was referred to the Sacred Heart Hospital Dec. 2, 1937, by her physician, Dr. Charles Ihle of Cleghorn. Her past history revealed no serious illnesses and no operations. Her menses began at 13 years and were normal. The patient's first labor occurred in 1930; the labor was long and difficult and a stillbirth resulted. Her second labor in 1932 was normal. During her third pregnancy her blood pressure was elevated, being 170 systolic and 90 diastolic, but no toxemia developed. Her third labor, in December 1934, was normal. Following the third labor her blood pressure remained elevated and a valvular heart disease was first noted.

Her last menses before her fourth pregnancy occurred Feb. 23, 1937. During the pregnancy she felt weak and tired and had frequent headaches. There was no albuminuria or edema, but her blood pressure was 180 systolic, 100 diastolic. She had no unusual abdominal or pelvic symptoms. December 1 the patient complained of a severe headache with vertigo and blurred vision, and the following day she consulted her physician, who found that her blood pressure was 210 systolic, 110 diastolic, the urine containing four plus albumin. She was sent to the hospital at once.

On admission her temperature was normal and her pulse 120; she complained of severe headache and blurred vision. No edema was present. The heart was moderately enlarged and a double murmur was present. The urine was loaded with albumin and the hemoglobin content was 56 per cent. She was given magnesium sulfate by mouth and hypodermically; pentobarbital was given at frequent intervals and fluids were forced. Free evacuation resulted. The following day there was no improvement and her blood pressure was 220 systolic, 120 diastolic. One ounce (30 cc.) of castor oil was given and was followed by 16 grains (1 Gm.) of quinine in divided doses. Labor began in a few hours and the membranes ruptured at 7 o'clock the following morning.

Examination one hour later showed the fetal head high and to the right above the symphysis. Strong uterine contractions were felt. The cervix was very high up beneath the bladder and one had to displace the posterior vaginal wall to locate the cervix, which was partially dilated and effaced. The posterior vaginal wall was pushed anteriorly by a firm fluctuant mass which compressed the rectum and displaced the fetal head high to the right and out of the pelvis. On rectal examination a cystic mass was felt in the culdesac between the rectal and vaginal walls. The patient's pains were regular and strong but the labor progressed slowly. The blood pressure was 220 systolic, 140 diastolic. She was kept drowsy by pentobarbital sodium and at 11:30 occurred her first and only convulsion, which was quite severe. Magnesium sulfate and morphine were given hypodermically. By 1 p. m. dilatation and effacement were complete. The head was felt above the symphysis through the thinned out lower uterine segment and at each contraction it felt as if the lower uterine segment would rupture.

Dr. Roy Crowder, an obstetrician of Sioux City, then saw the patient in consultation. Under light ether anesthesia a large needle on a syringe was introduced into the cystic mass through the posterior vaginal wall near the cervix in the median line. Two hundred and fifty cc. of clear fluid under pressure was removed. The head rapidly engaged and the needle had to be withdrawn to permit delivery, which was abrupt and spontaneous. The baby was a male and weighed 8 pounds (3,630 Gm.). It was in good condition but had an incomplete harelip. The third stage of labor was normal.

The patient's postpartum period was normal. She had no convulsions or headache, her pulse was 80 and her blood pressure came down to 170 systolic, 100 diastolic. There was no abdominal pain or tenderness. On the ninth day the hemoglobin

7. Davidson, A.: A Case of Dystocia Due to Cyst of Broad Ligament, *J. Obst. & Gynaec. Brit Emp.* 42: 569-571 (June) 1935.

was 65 per cent and the red cells numbered 3,400,000. No mass was felt on abdominal or rectal examination. A laparotomy was performed on the tenth day through a left paramedian incision. A small blood clot was lying free over the dome of the bladder and a few soft fibrinous adhesions were present between the left broad ligament and the culdesac. A soft flabby cyst 8 cm. in diameter was present in the left broad ligament, the peritoneal layers of the broad ligament being freely movable over the cyst. The left tube was elongated and stretched out over the superior surface of the cyst. The ovaries and right tube were normal. The left tube and cyst were removed by splitting the peritoneal layers of the broad ligament. The cyst had no pedicle and but little blood supply. The appendix, which was grossly normal, was removed. When the cyst was filled to capacity it held 500 cc. and was 12 cm. in diameter. The wall of the cyst was thick and the inner surface smooth.

After the operation there was no vomiting or distention and little pain, and convalescence was uneventful. The patient was dismissed from the hospital on the eleventh postoperative day. Two months later when the baby's hip was repaired she was feeling well. Her blood pressure was 180 systolic, 90 diastolic, the hemoglobin content was 80 per cent, red cells numbered 4,000,000, and the urine was free of albumin.

SUMMARY

Among the sixty-two cases of parovarian cysts complicating pregnancy that are analyzed from the literature, complications necessitating emergency operations occurred in sixteen cases. A cyst incarcerated in the pelvis caused dystocia in seven cases.

Parovarian cysts usually grow rapidly during pregnancy. They may be incarcerated in the pelvis or (as in seventeen cases) have a pedicle and be movable and be in any position in relation to the uterus. The fourth month of pregnancy is the most favorable period for intervention. Torsion is a common complication of pregnancy. Postoperative abortion after laparotomy is not common.

Parovarian cysts diagnosed in the first half of pregnancy should as a rule be removed because of their tendency to enlarge rapidly and of the possibility of complications such as torsion. In the latter half of pregnancy, early removal is indicated unless the cyst is abdominal. When dystocia results from an incarcerated cyst, aspiration of the cyst by way of the vagina when possible and delivery of the fetus by the vaginal route is the procedure of choice. When aspiration is not feasible, cesarean section and removal of the cyst then or later is indicated. No maternal deaths occurred in the sixty-two cases reported.

The Power to Think Consecutively.—In his daily work a practicing physician has little or no control over the questions presented to his mind; mainly diagnostic, they are brought to him for solution one after another in great profusion. His solutions are reached in by far the greater number of instances by no process of logical reasoning, but on the basis of previous experience or on the basis of what we call intuition, a faculty often remarkably developed. Inevitably his mental activities are chiefly of this kind. The questions are not only profuse, but diverse; the mind is jerked forcibly from one question to another. When problems relating to the mechanism of disease present themselves, as they inevitably do to the more active minds and in the earlier years, then, before a clear line of thought can be established or followed to a satisfactory conclusion, the mind is torn from its problem to be confronted with others. The practice of medicine from its very nature is destructive to consecutive thought; its continued practice weakens the very power to think consecutively, and therefore clearly, on problems relating to the nature of disease, a matter very vital to progress.—Lewis, Sir Thomas: *Research in Medicine and other Addresses*, London, H. K. Lewis & Co., Ltd., 1939.

THE AFTER-TREATMENT OF COLLES FRACTURE

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Functional recovery is the yardstick by which success in the treatment of any injury to a bone or a joint is measured. In fractures of the shafts of long bones a moderate deviation of bony alignment may be compatible with a good functional result. A fracture of the shaft of the humerus which has united solidly may be consistent with a good functional recovery even in the presence both of shortening and of loss of alignment. As a general rule, however, the closer the fracture line approaches the articulating end of the bone, the more important it becomes to secure good reduction of the deformity. In certain fractures, complete restoration of function cannot be obtained unless a nearly anatomic reduction of the fragments has been achieved. Colles fracture belongs to the latter group.

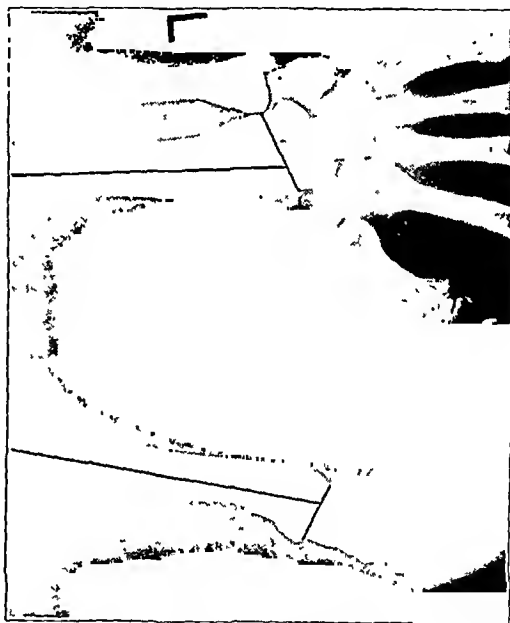


Fig. 1.—Normal wrist joint marked to indicate the forward and inward inclination of the articular surface of the radius.

Examination of a roentgenogram of a normal wrist joint (fig. 1) will reveal, among other things, that (1) in the anteroposterior view the concave articular surface of the radius faces inward at an angle of about 25 degrees; (2) in the lateral view the articular surface of the radius faces downward toward the palm at an angle of about 15 degrees, and (3) the styloid process of the radius extends distally beyond that of the ulna.

Unless reduction of a fracture satisfactorily restores these normal relationships there will be only a partial functional recovery with some persistent limitation of flexion or extension at the wrist, a persistent radial deviation of the hand and perhaps even a limited and painful rotation at the radio-ulnar joint.

A satisfactory result following Colles fracture means a complete restoration, within a reasonable time, of muscle power and motion in the hand, wrist, forearm and elbow and in the upper arm and shoulder as well.

Read before the Surgical Section of the New York Academy of Medicine, May 6, 1938.

It means free, coordinated movements of the fingers and thumb, activated by strong and supple muscles in the forearm, but it also includes a flexible elbow and shoulder which permit easy elevation of the extended arm above the head. What is meant by a reasonable time? The period naturally varies with the type of fracture and the age and condition of the patient, but in the average adult, with a fracture of average severity,

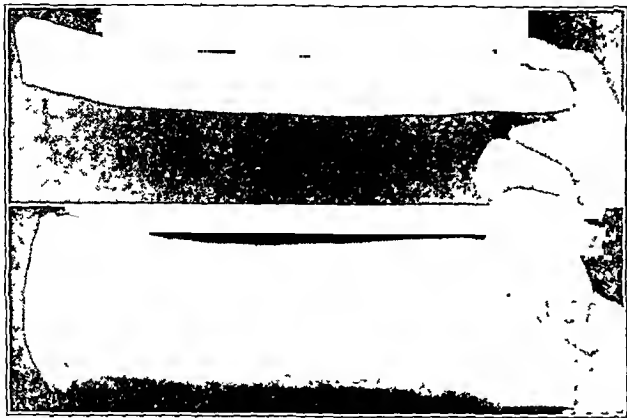


Fig. 2—Dorsal plaster splint as seen from the side and from above

it should not exceed seven or eight weeks. If one assumes that the fracture has been satisfactorily reduced, then the rehabilitation of the patient within the specified time depends entirely on the method of fixation of the fracture and on the after-care.

Colles fracture has been the subject of a great deal of experimentation in the matter of fixation and after-care. The invention of the plaster of paris bandage almost a hundred years ago was followed by a period during which massive heavy casts were applied to limbs. A fracture about the wrist meant the encasement of the whole arm, from the fingertips to the shoulder, in a cast which sometimes immobilized the patient as well as the wrist. On removal of the cast some months later it was the general rule to find a rigid hand, a withered arm and a deformity of a fracture which had not been reduced in the first place.

About fifty years ago, in an effort to prevent the horrible atrophy of bone and soft tissues that followed prolonged immobilization in heavy casts, Lucas-Championnière introduced early massage and early motion in the treatment of all fractures. His results were so superior to those obtained by previous methods that his practices received considerably wide acceptance within a few years. He deserves more credit perhaps than any one else for having emphasized the importance of functional recovery after injury to the bone.

The widespread use of physical therapy during and since the World War has been directly in line with the recognition of the importance of early restoration of function. The hand, wrist and forearm, because of their economic importance, have naturally become favored sites for the use of all physical therapeutic agents. These have included radiant heat, diathermy, early passive movement, early massage, electrical stimulation and ultraviolet irradiation.

Our experience at the Roosevelt Hospital with most of these agents has not been satisfactory and we have discarded all measures except active exercise in most cases of Colles fracture. We have found that other forms of physical therapy are usually unnecessary and, in some instances, may be harmful.

For many years we have followed a routine which I believe still has many advocates. Our patients were instructed to return to the fracture clinic for treatment the day following reduction of the fracture and on alternate days thereafter. These treatments consisted of radiant heat, light massage and cautious attempts at passive motion of the fingers and wrist, the fracture site being carefully supported on the anterior plaster splint and by the fingers of the operator. Active motion was encouraged as much as possible. Diathermy was begun at the discretion of the physical therapist, usually at the end of four or five days. Splints were discarded during the third week except in badly comminuted fractures, which were supported for one week longer. Heat, massage and diathermy were continued until the patient was discharged.

As time went on many practical objections to that method of after-care became apparent. The following are a few of the observations that we made:

1. Many patients were frightened at the very thought of having a splint removed for inspection so soon after the fracture had been set. Protective muscular spasm was so exaggerated that relaxed passive motion of the fingers was almost impossible in spite of gentle stroking massage and other forms of reassurance. In many patients this fear of pain on motion persisted and obviously retarded active use of the fingers in the later stages of treatment.

2. While some patients objected to any form of passive motion at the wrist, others who were less sensitive or less complaining permitted more passive motion than was good for them.

3. In a large percentage of the cases, swelling and pain in the fingers and wrist persisted for ten or twelve days after the injury. This we attributed entirely to two causes: lack of rest at the site of fracture and fear of active use of the fingers.

4. We found that simple transverse fractures almost invariably gave a good result. On the contrary, in



Fig. 3—Volar splint as seen from the side and from below. Notice the portion cut away to accommodate the thenar eminence.

oblique and comminuted fractures the good position that had been obtained at the original reduction was often lost following early passive motion, in spite of every precaution. Recurrence of displacement, even when noticed early and corrected, prolonged recovery indefinitely. We saw many cases in which secondary displacement occurred during the third week of treatment.

5. Recovery of strength in the muscles of the hand and forearm was slow and was not affected appreciably by massage.

6. Diathermy did not hasten the healing of the fracture, nor did it increase the comfort of the patient.

7. We began to realize that the after-care of a Colles fracture entailed a tremendous expenditure of time on the part of the patient, the physician and the physical therapist.

About four years ago we began to abandon the use of passive motion and early massage and prolonged



Fig. 4—Completed splint. The thumb is entirely free and the fingers may be fully abducted. Notice in the palmar view that the plaster does not extend beyond the proximal flexion crease.

the period of fixation. Today I am quite convinced that a better recovery will be obtained in a Colles fracture if one provides, first, uninterrupted fixation of the fragments until union of the bone is secured, and, second, a splint which allows complete function of every muscle and joint that does not have to be immobilized.

Our procedure at present is a simple one. If roentgenograms show a satisfactory reduction, anterior and posterior plaster splints are applied with the wrist out straight or in slight extension and with the forearm midway between pronation and supination. The posterior splint (fig. 2) extends from the upper third of the forearm to the middle of the dorsum of the hand. The anterior splint (fig. 3) extends down to the proximal flexion crease of the palm. The portion of this splint which overlaps the thenar eminence is cut away so that the thumb can be brought over to touch the base of the little finger. Both splints are lined with a very thin layer of cotton padding, and they are securely fixed with gauze bandage. The patient is instructed to start immediate active motion of the fingers. He is permitted to discard the sling at home for several hours at a time to permit elevation of the arm and flexion and extension of the elbow.

These splints are not disturbed for about five days. By that time most of the swelling will have disappeared and the splints will be ready for final adjustment. Without disturbing the splints, we remove several layers of the outer gauze bandage. A very light circular bandage of plaster is then applied over the splints and gauze. This circular bandage must be snug enough to prevent any movement at the wrist and it must be applied so that it does not interfere in any way with complete motion of the fingers and thumb (figs. 4 and 5). The patient should be able to clench the fist completely and to pick up and use a pencil or a fork without difficulty. The splint should be light enough so that the sling may be discarded completely after a few days.

There is very seldom any need for further adjustment of the splints, and they are worn until the fracture is solidly healed and all danger of recurrence of displacement has passed. In children and young adults with simple transverse fractures, fixation for three or four weeks may be sufficient. Very oblique or badly comminuted fractures should be immobilized for four or five weeks, and occasionally for six. When the splints are finally discarded, no supporting bandage is necessary. The patient is instructed to begin active motion at the wrist and he is seen once a week until he is discharged.

I have found that at the end of four or five weeks bony union is firm and that the muscles of the hand and forearm, having been actively used throughout the period of fixation, are supple and strong. Not only is the wrist joint free from pain and tenderness but, in the great majority of cases, about 50 per cent of the normal excursion of the joint is present at the time the cast is discarded. I am firmly of the opinion that a great deal of the limitation of motion of the joint usually attributed to intra-articular stiffness is due to muscular shortening. There is some limitation of motion due to contraction of the joint capsule and ligaments. This, however, usually yields readily to the pull of the actively contracting muscles of the forearm. Functional recovery in the average case is complete in six or seven weeks.

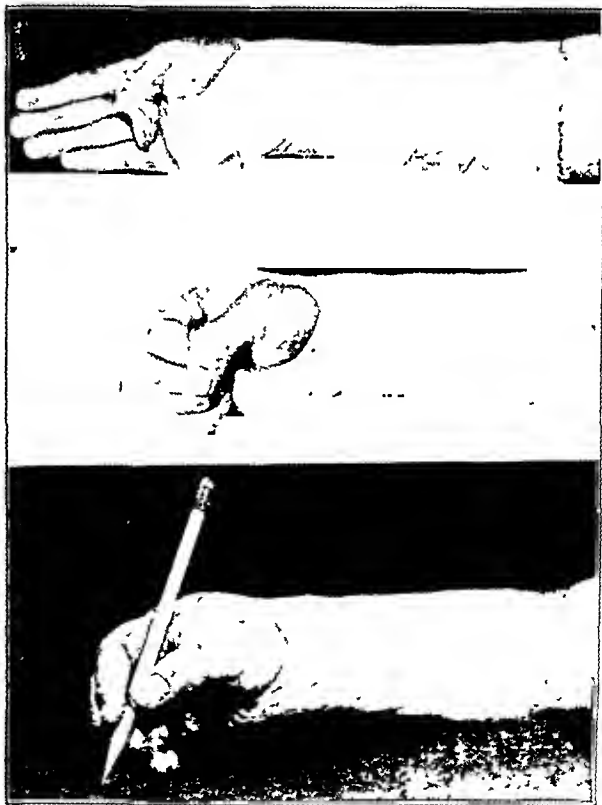


Fig. 5—The completed splint, permitting unrestricted use of the fingers. The patient should be able to touch the base of the little finger with the thumb, clench the fist and hold a pencil without difficulty.

Fractures in adults which have never been satisfactorily reduced will never have complete functional return. Severely comminuted fractures are not only difficult to reduce but difficult to maintain in good position without some form of continued traction. I have had recurrence of deformity in many cases of this

type in spite of uninterrupted and prolonged splinting. In these cases, some limitation of motion due to bony deformity at the wrist joint is common and usually permanent. It is important to note in this connection that, whereas a functional deficiency due to muscular or ligamentous shortening will be overcome almost invariably, a functional loss due to imperfect reduction will seldom disappear.

Our experience with this method of fixation of Colles fracture covers a period of approximately four years. I have found it physiologically sound. I believe that it has spared the patient a great deal of pain and that, in addition, it has permitted him greater use of the injured limb during the period of treatment. I am convinced that it has provided functional recovery within the prescribed period with less effort, with less inconvenience and discomfort and certainly with less risk than the methods hitherto employed.

CONCLUSIONS

I wish to emphasize the following points once more:

1. A good reduction is imperative; without it no method can promise satisfactory recovery.

2. The position of the fragments must be rigidly maintained by uninterrupted fixation until bony union has occurred.

3. The plaster splint should completely immobilize the wrist joint and the site of fracture, but it must permit full and unrestricted use of the fingers and thumb.

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UNUSUAL LOCATION OF GLOMUS TUMOR

REPORT OF TWO CASES

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Our knowledge concerning the structure, distribution and function of the normal glomus has been greatly expanded since the original description by Masson¹ in 1924 of a tumor which resembled the glomus coccygeum of Luschka. Masson's description of the glomus tumor and Popoff's² subsequent studies concerning the distribution and alterations of the normal cutaneous glomus in conditions involving the peripheral vascular bed have stimulated interest in this subject.

It was suggested that the glomus tumor should not be regarded as a neoplasm but as an exaggerated development of a normal structure. This conception would simplify our understanding of the tumor and aid us in explaining its physiologic manifestations. Regarding its development and distribution, it is of practical importance as well as of academic interest that the normal glomus, which represents a cutaneous arterio-venous anastomosis, is not present before birth and does not begin to develop in the infant until after one month of postnatal life. Thus, the difficulty of maintaining an even, warm surface temperature in the newborn infant can now be explained on the knowledge that the

inability of the infant's skin to adjust itself to sudden changes in temperature is due to the absence or paucity of these cutaneous thermoregulators. Only after the glomus bodies are fully developed does the individual appear to become accustomed to sudden changes in atmospheric temperature. On the other hand, the glomus undergoes atrophy in persons beyond the age of 60, and it is then less efficient in its thermoregulatory control of the skin. This would help to explain the difficulties that are encountered by aged persons during sudden changes of atmospheric temperature. The number of normal glomus bodies varies in different locations, and the increased number in the extremities probably speaks for a necessary accessory mechanism which helps to maintain the cutaneous temperature in those parts of the body which are most subject to sensory stimuli. These cutaneous pressure and thermoregulators have been found to occur chiefly on the palmar and plantar aspects of the hands and feet, the subungual regions of the extremities and, in lesser numbers, over the body in general. A close anatomic association of the glomus bodies with the pacinian corpuscles has been observed, and Maximow³ suggested an accompanying functional association of these bodies with cutaneous pressure control.

Tumors of the glomus bodies have directed our attention to their physiologic activities, to their abnormal behavior and to the pathologic changes that occur in the previously normal glomus structures of the extremities in diabetic gangrene, thrombo-angiitis obliterans and arteriosclerotic gangrene.

Up to the present time about ninety tumors have been described,⁴ located chiefly on the extremities and generally beneath the nails of the fingers and toes. It is of interest that no report has appeared of the occurrence of these tumors on the genitalia of either sex. Because the glomus tumor in both of our cases occurred on the penis, one in a child and the other in an adult, we consider it sufficiently important to call attention to their presence in a hitherto undescribed location.

GENERAL CHARACTERISTICS OF GLOMUS TUMORS

In from 40 to 50 per cent of the tumors recorded there was a previous history of trauma and they occurred chiefly on the hands and feet. The average duration of their presence, from the time of their appearance to the development of symptoms, was nine years. The tumors vary in size from one-eighth inch to three-fourths inch (0.3 to 2 cm.) in diameter, or slightly larger. The small tumors are usually subungual, while the larger ones are present in easily distensible tissue. The variation in size often depends on whether or not the tumor is under pressure. Pressure on the tumors not only influences their size but determines also the degree of associated pain. Most of the recorded cases presented a history of excruciatingly painful crises with radiation of the pain. All the subungual tumors were extremely painful and the mere brushing of the affected finger by the clothes or by some other light pressure would be sufficient to initiate a painful crisis. Scraping the nail to great thinness was found to reduce the amount of pressure and thus relieve the patient considerably.⁵ Tumors that were located in the soft tissues, such as

1. Masson, Paul: *Le glomus neuromyo-arteriel des regions tactiles et les tumeurs*, Lyon chir., 21: 257 (May-June) 1924.

2. Popoff, N. W.: *The Digital Vascular System with Reference to the State of the Arteriosclerotic Gangrene, Diabetic Gangrene, and Supernumerary Digits in Man*, Arch. Path. 14

3. Maximow, A. A., and Bloom, William: *A Text Book of Histology*, Philadelphia, W. B. Saunders Company, 1930, pp. 284 and 355.

4. Radasch, H. E.: *Glomus Tumors*, Arch. Path. 23: 615-633 (May) 1937.

5. Raisman, Victor, and Mayer, Leo: *Tumor of the Neuromyo Arterial Glomus: Report of Cases*, Arch. Surg. 30: 911 (June) 1935.

on the arms or legs, and in our cases on the genitals, were usually painless. Numerous explanations have been offered for the occurrence of painful crisis, but the obvious reason is one of pressure, causing pain as a result of constriction of the nerve end organs. Though the suggested association of a disturbance of sym-

pathetic nerves may be a factor, it has been shown in one case that periarterial sympathectomy does not give relief.⁶ Complete surgical excision of the tumor produces complete relief, and recurrences have not been observed. Stout⁷ records a case in which a tumor recurred after nine years, but this is the only recorded

case of a recurrence



Fig. 1 (case 1).—Persistent, varix-like lesion on ventral surface of child's penis.

and consequently one may justifiably raise the question whether excision of the tumor was complete.

Systematic attempts to determine whether vasomotor reactions are associated with glomus tumors were made by Stabins and his associates.⁸ They made local temperature studies before and after operation on two female patients who had subungual glomus tumors of the hand. Normally there is a synchronous drop in surface temperature in the hands on being immersed in cold water. However, after patients immersed their hands in water at 15 C. it was found that recovery to their previous temperatures was more rapid on the involved side than on the uninvolved side; also that during immersion the temperature on the affected side did not drop as low as on the unaffected side. There was a difference of between 6 and 8 degrees C. on the two sides. After operation the temperature changes in the two hands were found to be synchronous. There was a vasodilatation in the skin of the affected member, which disappeared after the surgical removal of the tumor. However, the disappearance of the vasodilatation did not occur until about eight weeks after surgical excision. Owing to the persistence of some pain at the site of operation, associated with vasodilatation, the authors considered the vasodilatation of the tumors as being caused by the painful sensory stimuli. This belief was strengthened by the fact that the vasodilatation disappeared when the pain ceased. Mason and Weil⁹ cited a case of Paulian and his associates in which there was an increased feeling of warmth and perspiration over the whole right side of the body in which the increase in temperature of from 0.5 to 2 degrees C. was observed on the affected side. These changes disappeared following operation. Theis¹⁰ studied a person aged 69 who complained of inter-

mittent claudication as a result of peripheral vascular disease associated with senile arteriosclerosis. Following treatments of alternating positive and negative pressure the circulation improved and the thermocouple temperature became normal. Six weeks after treatment for the claudication a glomus tumor appeared on the leg. This was associated with sharp, agonizing pain and was followed by a peripheral drop in temperature, probably owing to an arterial spasm caused by the tumor. Excision of the tumor brought prompt relief and a return of the peripheral temperature to normal. The observations emphasize the physiologic effects produced by these tumors and indicate the association of the glomus with the maintenance of the temperature of the skin, whether through dilatation or constriction of the vessels. This suggested that under pathologic conditions congestion causes swelling with pressure on the nerves and consequent paroxysms of pain, while cold causes contraction of the muscular walls of the vessels, with compression of the nerve fibers between the glomus cells and resulting pain. In either event, pressure is the important precipitating factor and



Fig. 2.—Showing the proximity of the tumor to the cutaneous surface.

whether or not the disturbance is a central one with involvement of the sympathetic system is still a moot question.

The glomus tumor can be removed only by complete surgical excision. Adair¹¹ attempted to apply radiation in one case, using one square radium plaque of 700 millicurie hours at 1 cm. distance and a 3 mm. brass filter. This treatment was repeated but caused no change in the tumor. Lewis and Geschickter¹² applied

6. Burman, M. S., and Gold, A. M.: Glomus Tumor, *New York State J. Med.* 35: 618 (June 15) 1935.

7. Stout, A. P.: Tumors of the Neuromyo-Arterial Glomus, *Am. J. Cancer* 24: 255 (June) 1935.

8. Stabins, S. J.; Thornton, J. J., and Scott, W. J. M.: Changes in Vasomotor Reaction Associated with Glomus Tumors, *J. Clin. Investigation* 16: 685-693 (Sept.) 1937.

9. Mason, M. L., and Weil, Arthur: Tumor of a Subcutaneous Glomus, *Surg., Gynec. & Obst.* 58: 807 (May) 1934.

10. Theis, F. V.: Subungual Neuromyo-Arterial Glomus Tumor of Toe, Effect of Increased Peripheral Temperature, *Arch. Surg.* 34: 1-11 (Jan.) 1937.

11. Adair, F. E.: Glomus Tumor: A Clinical Study with Report of Ten Cases, *Am. J. Surg.* 25: 1 (July) 1934.

12. Lewis, Dean, and Geschickter, C. F.: Glomus Tumors (Arterial Angioneuroma of Masson), *J. A. M. A.* 105: 775 (Sept. 7) 1935.

four courses of x-rays to a glomus tumor which had previously been diagnosed as Ewing's tumor, with no satisfactory results. One of the cases of Stabins and his co-workers failed to respond to 50 mg. hours of radium unfiltered. Stabins considered this as a therapeutic test verifying the diagnosis of glomus tumor. In one of our cases, which we at first considered

site of the tumors. The pressure exerted by the expansile tumor is probably the cause of the demineralization of the contiguous bone. This appears to be a form of pressure atrophy rather than an atrophy of disuse, as was suggested by Stabins.

REPORT OF TWO CASES

CASE 1.—A boy aged 6, seen by us July 15, 1936, had a redundant prepuce with a grapelike varicosity on the inner surface of the foreskin, which became evident when the foreskin was retracted. This was about the size of a marble and had the appearance of a small cluster of veins which extended back to the ventral surface of the shaft. The nodule was a bluish purple and caused the patient no discomfort except for some pain on urination. The history obtained from the child's mother was that a bluish discoloration, similar to that observed when the child was admitted to the hospital, was first noticed when the patient was 1 year old. The redundant prepuce and the small grapelike nodule were always present, but the varix-like group of veins on the ventral surface of the penis had not been noticed. The mother stated that the child had been playing with a wagon and was hit in the region of the penis with the tongue of the wagon; it was following this that her attention was called to the varix-like enlargement. The child's past medical history and family history were irrelevant. A circumcision was performed and the foreskin and the accompanying cluster of veins were sent to the laboratory for examination.

The gross specimen consisted of two sections of prepuce, the larger section of which showed a blue discoloration on the



Fig. 3 (case 2).—Section of tumor under low power

hemangio-endothelioma, four courses of roentgen treatment were given without any change in the size or character of the tumor. Two months after this treatment the true nature of the tumor occurred to us. The stubborn resistance of the glomus tumor to all means of irradiation would tend to strengthen the objection to the so-called epithelioid cells being cells of embryonic character, particularly angioblasts, since all such cells are radiosensitive. Differential stains did not enlighten us as to the possible origin or nature of the glomus cells.

Although the majority of the tumors occur singly, Weidman,¹³ Bergstrand,¹⁴ Stout and others¹⁵ reported cases of multiple tumors. The second case reported by Bergstrand offers the additional observation that there was a diminished density of the bones of the foot in which the multiple tumors occurred, which resembled multiple cysts. The tumors in his case occupied an intra-osseous position. This occurrence had not been reported previously, though others had observed rarefaction of the phalanges, as observed by x-rays, at the



Fig. 4.—Section under high power showing intimate relationship of the glomus cells to the lung, endothelial cells of the Sucquet-Hoyer canal

distal portion. When cut, it was observed that numerous dilated vascular channels were filled with blood.

Microscopic examination revealed that the sections were covered by skin and contained numerous angiomatous units, which extended into the subcutaneous tissue from an area immediately beneath the cutaneous surface. In one of the larger sections there were twelve units placed close together. They consisted of circumscribed, angiomatous nodules that were

13. Weidman, F. D., and Wise, Fred. Multiple Glomus Tumor of Order of Telangiectases, *Arch. Dermat. & Syph.* 35: 414-426 (March) 1937.

14. Bergstrand, Hilding: Multiple Glomus Tumors, *Am. J. Cancer* 23: 470-476 (March) 1937.

15. Hjal, Einar, and Melom, Reidar: Multiple Glomus Tumors, *Med. rev., Bergen* 53: 545-558 (Dec.) 1926.

surrounded by collagen. The unit itself was characteristic of an enlarged glomus body. It contained a Sucquet-Hoyer canal, which was lined by a single layer of endothelium. The wall was made up of large polyhedral cells that contained pale acidophilic cytoplasm and deeply stained nuclei. The cells were characteristic of those which had been referred to as epithelioid cells and were several layers in thickness. Silver stains (Wilder) showed the presence both of reticulum and



Fig. 5.—Section under high power showing the nature of the glomus cells, which are several cell layers in thickness

of what appeared to be myelinated nerve fibers. There were small arterioles and venules in the capsular areas, which apparently represented the nutrient vessels of the glomus. In some areas the glomus cells were in intimate contact with the endothelial lining of the vascular spaces, while in others they were separated by smooth muscle and collagen. The outstanding microscopic picture was the nature and arrangement of the glomus cells which surrounded the vascular channels and blood vessels. The cells resembled small nests of epithelioid cells, although the origin could not be determined. No mitotic figures were seen in any sections.

The diagnosis was glomus tumor of the penis.

CASE 2.—A man aged 25 presented himself in the surgical outpatient department with an angiomatous-like lesion on the penis. The patient stated that early in infancy a small red "pimple" appeared on the penis. When the patient was 14 he was hit with a baseball bat in the region of the genitals and the previously nonpainful nodule became swollen to the size of a walnut. It subsided shortly after this and assumed the size observed when he presented himself for treatment. Whereas the tumor was nonpainful previous to the injury, it became painful on pressure subsequent to it. The tumor was situated on the left dorsolateral surface of the penis about 3 cm. from the corona and measured 1.5 by 1 cm. The appearance in situ was that of a solitary varix. It was slightly raised above the skin, was ovoid and did not pulsate. Pressure on the lesion did not cause blanching. On dissection the nodule was found to be composed of numerous vascular channels and did not have a proximal and peripheral blood supply like a varix but was fed and drained by numerous vascular channels that extended in several directions.

The specimen received in the laboratory consisted of two small pieces of cutaneous tissue which showed the presence of several dilated veins within their substance. On section these were found to be filled with blood and closely resembled varicose veins.

Microscopically the section showed a cluster of vascular channels which were lined by a single layer of endothelium. Immediately around the endothelial lining were cells that were two and three cell layers in thickness. They were polyhedral and contained acidophilic cytoplasm. The supportive tissue about the vascular spaces was collagenous. The cells had the appearance of glomus cells, and silver stain (Wilder) showed the presence of neuroreticular material.

The diagnosis was glomus tumor of the penis.

COMMENT

Popoff made an exhaustive study of the glomus units of the body in normal and pathologic conditions. He described the normal glomus as consisting of an arterio-venous anastomotic unit which was made up of an afferent artery; the tortuous Sucquet-Hoyer canal, which consists of a narrow lumen lined with endothelium and surrounded by a thick mantle of so-called epithelioid cells (of doubtful nature); the argentophilic fibers about the Sucquet-Hoyer canal; the primary collecting veins, and, finally, an outer lamellated encircling layer of collagen. He found that the distance from the inner surface of the epithelium of the skin to the glomus in the fingers and toes is about 0.5 to 1 mm.



Fig. 6.—Silver stain (Wilder) revealing the argentophilic fibers among the glomus cells

He further observed the pertinent fact that there was no particular relation of the glomus body to the pacinian corpuscles. In his discussion of the quantitative distribution of the Sucquet-Hoyer canals he made no mention of their distribution in the male genitalia, nor were we able to find any other reference to them in this location. Because of the complex vascularity of the penis,

the finding of two tumors in this location would indicate that both normal glomus structures and possibly glomus tumors are more common here than is generally considered.

There is sufficient evidence to support the fact that the glomus is a factor in changes in cutaneous temperature. The implied alterations of cutaneous pressure have less evidence to support them. The studies of Popoff which showed the state of the glomus in arteriosclerotic and diabetic gangrene, as well as in thrombo-angiitis obliterans, may well raise the question of their association with blood pressure changes of known and unknown etiology. Cole and Sroub¹⁶ reported the presence of a painful glomus tumor on the finger of a woman aged 33 who had a blood pressure of 200 systolic, 110 diastolic. This may have been a mere coincidence, although it possibly suggests a sympathetic nervous disturbance which had expressed itself through the development of a glomus tumor. This may seem a bit far fetched but should be borne in mind in cases of so-called essential hypertension. Stout emphasized the predominance of glomus tumors among members of the Jewish race and suggests that the predominance of disturbances of the sympathetic nervous system in this group may be a factor in explaining the comparatively high incidence of glomus tumors among the Jews.

Popoff's studies failed to show that there was a primary specific change in the glomus system associated with thrombo-angiitis obliterans. The changes that occur in the arteries, veins and skin of the digits in this condition are attributed by him to an unknown vascular anomaly rather than to a disturbance in the glomus bodies.

We call attention to the fact that true thrombo-angiitis obliterans, which occurs independently of increased vascular tension, shows no pathologic changes in the glomus, while sclerotic gangrene and diabetic gangrene, both of which are commonly associated with an increased blood pressure, do reveal definite demonstrable pathologic changes. There is a difference in predilection of the pathologic changes in the various units of the glomus body in the two conditions. In the case of diabetic gangrene, hyaline degeneration appears in the intima of the Sucquet-Hoyer canal and in the preglomus arterioles, while the intima of the afferent artery remains intact. In sclerotic gangrene the hyaline degeneration is limited to the afferent artery of the glomus. Consequently, in those conditions in which increased blood pressure becomes a fixed state, comparable sclerotic changes can be observed in the glomus bodies of the digits, whereas in a condition such as in thrombo-angiitis obliterans, in which there is an absence of increased vascular tension, the glomus bodies are uninvolved. Cases of thrombo-angiitis obliterans represent a much younger age group than do those exhibiting diabetic and sclerotic gangrene, and it may be that the hyaline changes are an expression of degeneration associated with advanced years and may have no bearing on the general condition of hypertension. But the importance of the peripheral vascular bed in explaining vascular tone and the hypertensive state is so generally conceded that any additional facts which may elucidate this problem are worthy of serious consideration.

The high incidence of associated trauma (50 per cent) with these tumors raises the question of whether there might not be a congenital weakness in the glomus

bodies in the affected persons which manifests itself in an overdevelopment following injury, producing what is recognized as a glomus tumor. In both of our cases the tumors appeared on the prepuce when the patients were at least 1 year old. Whether the varix-like condition on the under surface of the shaft was always present in our first case and attention was drawn to it by the injury or whether it followed the injury could not be determined. The history of trauma precipitating a preexisting abnormality was more definite in the second case. We were unable to find any reports of the tumors appearing in patients at the age of 1 year though Adair reported one case in a child of 6 years. The implication in this case is that glomus bodies make their appearance on the male genitals as early as 1 year of age, if not earlier.

We reviewed the sections of 122 tumors of blood vessels that had been examined in this laboratory and were unable to find any other glomus tumor of the penis.

In our microscopic studies we were able to demonstrate the various elements that are necessary for the diagnosis of a glomus tumor, including the demonstration of the argentophilic fibers about and among the glomus cells of the Sucquet-Hoyer canals. In this connection we are inclined to agree with Slepian¹⁷ that the argentophilic fibers resemble reticulum more than they do nerve fibers.

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BERIBERI SECONDARY TO HERNIA OF THE MESENTERY

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Cases of beriberi resulting from inadequate absorption of vitamin B₁ as a consequence of prolonged vomiting in such conditions as pyloric obstruction or pregnancy, prolonged diarrhea, or short circuiting of the bowel have been reported, but in none was the disease as severe as in ours, nor, as far as we know, have all three etiologic factors previously occurred in the same case.

REPORT OF CASE

History.—E. G., a white man aged 39, who had been confined to bed for about two months because of paralysis of the lower extremities, was first seen by us Feb. 21, 1938. His nervous symptoms began early in December 1937, with numbness in the epigastrium. The numbness gradually spread downward over the lower part of the abdomen and the medial surfaces of the thighs and ultimately involved the entire lower extremities. Pain in the legs, insteps and arches began at about the same time. Weakness of both lower limbs followed shortly, so that by December 20 the gait was unsteady. December 28 the patient fell to the floor, unable to support his weight, and since that time had not been able to walk. Atrophy of the muscles of the lower extremities appeared rather suddenly toward the end of December, when the patient lost 10 pounds (4.5 Kg.) in a single week. About a month later numbness, then weakness and finally atrophy of the upper extremities appeared, but the paresthesias and weakness were not as severe in the upper as in the lower limbs. The sphincters functioned normally. The voice was reduced to a whisper during the first two weeks of January 1938 but recovered spontaneously. No other history of cranial nerve involvement was obtained. The only mental symptom was occasional disorientation in time and space. The temperature

16. Cole, H. N., and Sroub, W. E.: Glomus Tumor: Arterial Angiomyoma of Masson, *J. A. M. A.* 107: 428 (Aug. 8) 1936.

17. Slepian, A. H.: Glomus Tumor: Report of Two Cases with Histologic Observations, *Arch. Dermat. & Syph.* 36: 77-84 (July) 1937.

was not elevated at any time. The spinal fluid, obtained January 25, was clear and under normal pressure and was normal cytologically, chemically and serologically. The Wassermann test of the blood was negative. The spine appeared normal roentgenographically. Prostigmine was administered during January but the muscular strength diminished steadily. The patient had been a machinist but had never worked with heavy metals, nor was he addicted to alcohol.

The first cardiovascular symptom was edema of the eyelids, appearing late in November 1937, before the onset of the ner-

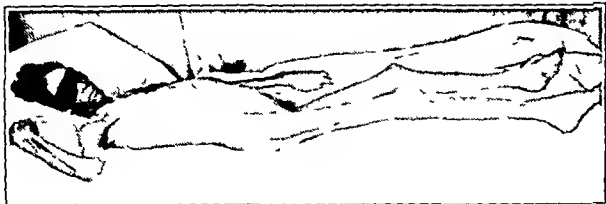


Fig. 1.—Appearance of patient March 15, 1938, showing extreme generalized muscular atrophy. The edema had disappeared everywhere except from the feet.

vous symptoms. It lasted only a few days at that time but reappeared in January 1938 and became much more extensive, involving the back and the distal portions of all four extremities. The urine was consistently normal. Orthopnea and constant dyspnea at bed rest, with frequent paroxysmal exacerbations, began about February 1 and were growing more severe.

The patient had had intermittent postprandial epigastric distress relieved by food, alkalis or vomiting since he was 10 years old. At the age of 18 an appendectomy and inguinal herniotomy on the left were performed in the hope of ameliorating his gastrointestinal symptoms, but recurrences were as frequent after the operations as before. In May 1925, when the patient was 27 years old, frequent vomiting occurred. A posterior gastro-enterostomy was supposed to have been performed at this time to relieve obstruction produced by a cicatrizing duodenal ulcer. For the next three and a half years he was entirely free from symptoms and subsequently had only mild recurrences until January 1937, when persistent vomiting again occurred. January 30 the abdomen was explored; no previous artificial connection between the stomach and any other abdominal organ was found, and a posterior gastrojejunostomy was done. The emesis stopped postoperatively, but diarrhea began during February and became so severe that the patient had from four to eleven stools a day. No blood, pus, ova, parasites or pathogenic bacteria were found in the stools, nor did the patient have fever. From May to September he worked in spite of the diarrhea, but toward the end of this period vomiting recurred and he became so thin and weak that he went to a hospital for observation.

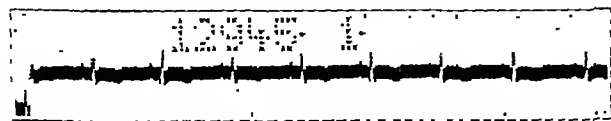


Fig. 2.—Lead 1 of an electrocardiogram taken March 8, 1938, after two weeks of thiamin therapy. Note inversion of the T wave.

He did not improve with bed rest, and insulin and dextrose administered parenterally. On the basis of roentgenologic studies it was decided that the vomiting occurred because food went through the pylorus and returned to the stomach through the gastrojejunostomy opening, thus forming a vicious circle. In the hope of breaking it a jejunostomy was performed in October. The diarrhea immediately ceased but emesis became worse. The patient vomited as much as 2,000 cc. at a time about once in thirty-six hours during November and December. In January 1938, about one month after the onset of the nervous symptoms, the vomiting spontaneously subsided. The patient's appetite remained good during most of his illness, but he lost about 50 pounds (23 Kg.) from his maximum weight. He had been eating a full diet since May 1937 except

during the immediate postoperative period in October and had been free from epigastric distress during this time. Toward the end of January 1938 several teeth which had hitherto been in good condition broke during mastication.

Physical Examination.—When we first examined the patient, Feb. 21, 1938, he appeared almost moribund. He was dyspneic, orthopneic, pale and very emaciated, with extreme atrophy and flaccidity of all the muscles of the extremities and trunk and marked pitting edema of the face, back, hands, legs and feet. The alae nasi dilated with each inspiration, and the accessory muscles of respiration were used. The veins in the neck pulsated forcibly.

The oral mucosa was pale. Portions of several teeth were missing. The tongue was deeply furrowed and bright purplish red. The gums were firm and pale.

The cardiac pulsations were diffuse, forceful and plainly visible in the second, third and fourth left interspaces, indicating enlargement especially of the right side of the heart. The apex was in the fourth interspace 5 cm. to the left of the nipple line and the right border 1 cm. to the right of the sternum. No murmurs were heard. The rate was moderately rapid and the rhythm regular. The blood pressure was 130 systolic and 70 diastolic. The systolic sound over the partially compressed brachial artery was extraordinarily loud and booming. The skin was everywhere warm and smooth, and the palms of the hands were unusually pink in spite of the paralysis, edema, anemia and absence of fever. The back was so edematous that satisfactory examination of the lungs was impossible posteriorly. Anteriorly they were clear.

The abdomen was tensely distended and tympanitic, with borborygmus continuously audible even at a distance from the patient. Peristalsis was constantly visible in all parts of

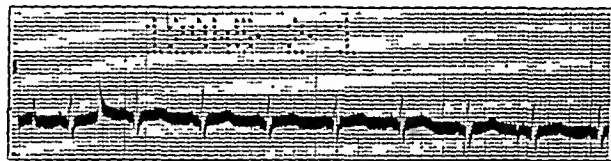


Fig. 3.—Lead 1 of an electrocardiogram taken March 24, 1938, after four weeks of thiamin therapy. The T wave is now erect.

the abdomen and was especially noticeable in an incisional hernia in the epigastrium at the site of the last three operations.

The patient could not move his toes, ankles or wrists; motions in the knees and fingers were minimal, and in the hips, elbows and shoulders only a little stronger. He was unable to turn from side to side in bed. The extreme degree of atrophy is indicated both by the photograph taken after the edema had almost disappeared (fig. 1) and by the following measurements: maximum circumference of calf $8\frac{1}{4}$ inches (21 cm.) right, $8\frac{1}{8}$ inches (20.6 cm.) left; circumference of thigh 8 inches (20.3 cm.) above the patella $9\frac{1}{4}$ inches (23.5 cm.) right, $9\frac{1}{4}$ inches (23.5 cm.) left; circumference of forearm 1 inch (2.5 cm.) below the internal condyle $7\frac{3}{8}$ inches (20 cm.) right, 8 inches (20.3 cm.) left, and circumference of arm $1\frac{1}{2}$ inches (3.8 cm.) above the internal condyle $6\frac{1}{4}$ inches (15.9 cm.) right, $6\frac{3}{8}$ inches (16.2 cm.) left. The biceps, triceps, patellar, achilles tendon, abdominal, cremasteric, and plantar reflexes were absent. Tenderness of the gastrocnemii was exquisite. Perception of pain and touch was impaired on the lower part of the abdomen and all four extremities, more extensively in the lower than in the upper, and more severely in the distal than in the proximal portions. Proprioception was absent in the knees, ankles and toes. The cranial nerves were all normal.

The patient's hemoglobin content was 62 per cent by the Dare method, the red blood cell count 3,160,000 and the white cell count 3,150, with 79 per cent neutrophils, 1 per cent eosinophils, 10 per cent lymphocytes and 10 per cent monocytes. Anisocytosis, poikilocytosis, polychromatophilia, occasional macrocytosis and the presence of rare nucleated red cells were revealed by the smear.

Diagnosis.—On the basis of the multiple neuropathy in the absence of alcoholism or contact with heavy metals, the edema, the enlargement of the right side of the heart and the peripheral vasodilatation, one of us (L. M. L.) made a diagnosis of

beriberi resulting from lack of absorption of vitamin B₁ as a consequence of the vomiting, diarrhea and short circuiting of the bowel.

Thiamin Therapy and Its Results.—Treatment with intramuscular injections of thiamin chloride (crystalline vitamin B₁) was begun February 23 with 25 mg., and the dose was repeated February 26. Beginning March 1, daily injections of 10 mg. were given for five days, then 25 mg. daily for

lift a heavy pen knife. After three weeks he turned his body enough so that he fell out of bed as he was going to sleep. He could extend his wrist against gravity after six weeks, and at the end of ten weeks he had sufficient control to pick up a nickel from the bed. Sensory disturbances undoubtedly interfered with his ability to perform skilled acts. The strength of the muscles in the lower extremities improved correspondingly except that no recovery was observed in the muscles moving the ankles and toes. Tonus gradually returned in the various muscle groups. Although nothing had been done to prevent contractures prior to the time we first saw the patient, none had appeared. However, as the tonus improved, contractures began to develop in the gastrocnemii and hamstrings. Treatment with plaster splints and passive exercise were instituted. The right cremasteric, right upper abdominal, both biceps and both triceps reflexes returned.

The patient's response to tests of sensation varied from day to day and was always better in the morning than in the evening. Improvement was therefore rather difficult to evaluate, but over a period of weeks it was evident that sensory perception was returning. At the initial examination, perception of pinprick was lost on the dorsal surfaces of both hands and on the volar surfaces of the digits and was impaired on the anterior surface of the right upper extremity almost as high as the axilla. By May 10 pinprick produced a sharp and burning sensation in all distal phalanges and was perceived on the remainder of the hands as only slightly dull instead of entirely absent. No impairment in sensation was noticeable above the wrists at this time. In the lower extremities, as in the upper, more improvement occurred in the proximal portions. Pain perception had been impaired throughout the lower limbs and lower part of the abdomen at first. May 10 it was normal down to several inches below the inguinal folds. In the right foot, which had formerly been totally anesthetic, pinprick was perceived as a burning sensation. As early as April 1, perception of cold had returned to the right foot. As sensory perception improved, he complained more of pain and paresthesias. He stated, for example, that his hands felt "swollen and heavy" after the edema had disappeared, although when it was present he had not mentioned this sensation. Allochiria was observed in the thighs April 6. Tenderness of the gastrocnemii diminished progressively. Proprioception returned in all the joints except those of the toes but remained incomplete in the ankles. Disorientation became retrograde only.

Course.—Although the nervous and cardiovascular systems improved under thiamin therapy, the patient, who was 5 feet 10 inches (178 cm.) tall and weighed only 94 pounds (42.6 Kg.) after the edema had disappeared, failed to gain weight and had persistent symptoms of gastric retention. His appetite, ravenous in the morning, was nil toward evening, when he felt too full to eat even when he did not vomit. April 8 emesis began again, and it recurred every few days, always late in the afternoon. This, together with the persistent loud borborygmus and visible peristalsis in both the stomach and the bowel, indicated that partial intestinal obstruction was present. A careful inspection of the roentgenograms taken in January,

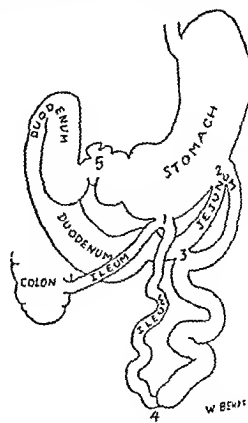


Fig. 5.—Diagram of the gastrointestinal tract as it was found at operation May 16, 1938: 1, gastro ileostomy, May 1938; 2, gastrojejunostomy, January 1937; 3, jejunojejunostomy, October 1937; 4, site of hernia in mesentery, and 5, duodenal ulcer scar.

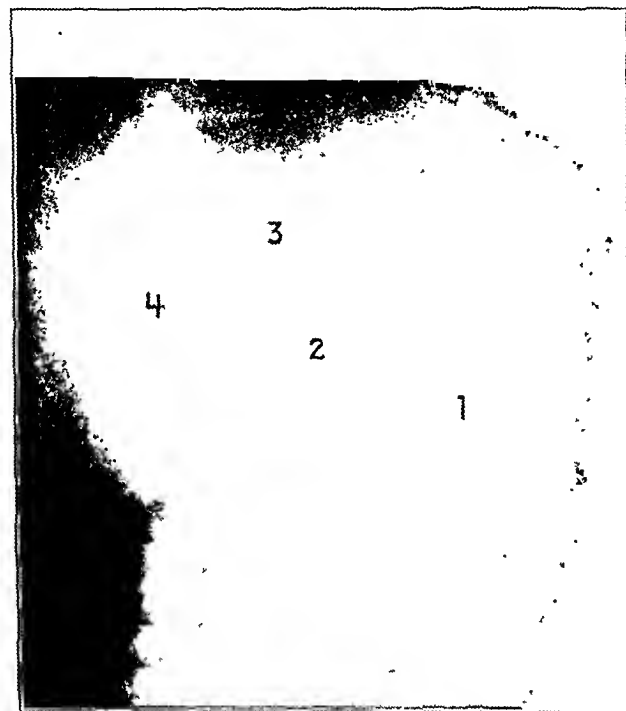


Fig. 4.—X-ray appearance Jan. 22, 1937: 1, greatly dilated pylorus; 2, duodenal cap; 3, duodenal ulcer scar, and 4, enormous dilatation of the duodenum distal to the ulcer.

fifty days and thereafter 10 mg. daily. The parenteral route was chosen both because of the severity of the deficiency and because the disease originated from faulty intestinal absorption. The day after the first injection the edema of the hands had diminished appreciably. By the time the patient entered Michael Reese Hospital in the service of Dr. Sidney Strauss nine days later the edema of the back was gone and that of the extremities greatly diminished. Within a month it had entirely disappeared. The dyspnea and orthopnea were relieved at about the same time. The pulse rate, which had been about 80 during the various periods of hospitalization in 1937 and had ranged between 100 and 130 during the last two weeks of January 1938, dropped to 50 three days after the first injection and then gradually rose to between 80 and 100. The size of the heart, as determined by percussion, also decreased, and the visible pulsations in the second, third and fourth interspaces became less conspicuous. In the electrocardiogram taken March 8 (fig. 2) the T wave in lead 1 was inverted, a change occurring frequently in beriberi. By March 24 it had become upright (fig. 3). March 8 the circulation time, determined by the calcium gluconate method, was fifteen seconds, a normal rate. The circulation time is usually decreased in patients whose decompensation results from subvitaminosis B₁ or thyrotoxicosis, in contrast to its increase in all other forms of decompensation. However, its return to normal is one of the first evidences of improvement in beriberi heart disease, and since the patient had been under treatment for two weeks when the determination was made, this result is consistent with the diagnosis.

Improvement in the nervous system was less prompt and less complete than in the circulatory system but was nevertheless progressive. About ten days after therapy was instituted, the patient lifted a handkerchief from the bed, an act he had been unable to perform for more than a month previously. At the end of two weeks he was able to grasp and

lift a heavy pen knife. After three weeks he turned his body enough so that he fell out of bed as he was going to sleep. He could extend his wrist against gravity after six weeks, and at the end of ten weeks he had sufficient control to pick up a nickel from the bed. Sensory disturbances undoubtedly interfered with his ability to perform skilled acts. The strength of the muscles in the lower extremities improved correspondingly except that no recovery was observed in the muscles moving the ankles and toes. Tonus gradually returned in the various muscle groups. Although nothing had been done to prevent contractures prior to the time we first saw the patient, none had appeared. However, as the tonus improved, contractures began to develop in the gastrocnemii and hamstrings. Treatment with plaster splints and passive exercise were instituted. The right cremasteric, right upper abdominal, both biceps and both triceps reflexes returned.

operations. Because it was thought that the patient could never become entirely well unless his assimilation of food could be improved, it was decided to explore the abdomen again.

Operation.—May 16, after two preoperative blood transfusions, an exploratory laparotomy was performed by Dr. Alfred Strass with the patient under cyclopropane anesthesia. The stomach was enormously hypertrophied and dilated, and the duodenum was about the size of a normal large bowel.

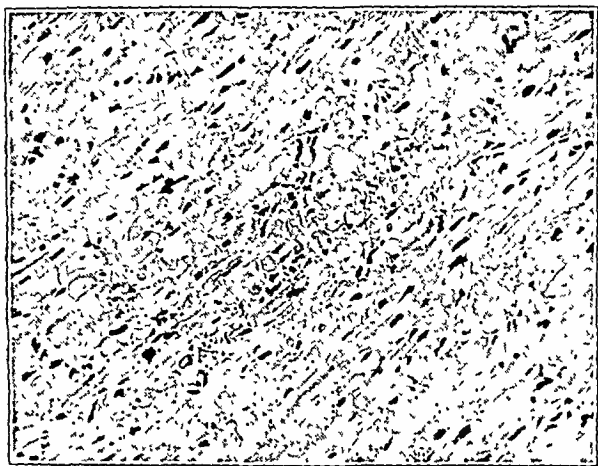


Fig. 6.—Section of myocardium, showing edema and disruption of muscle fibers and increased amount of loose areolar tissue.

The entire small intestine was brought outside the abdomen for examination. It was distended, but no vascular strangulation was observed. Three different anastomoses were found, one between the stomach and the terminal part of the ileum at a point about 1 foot from the cecum, presumably done in May 1925; another between the stomach and the proximal part of the jejunum, and a third between two loops of jejunum, one proximal to the gastrojejunostomy and the other distal to it (fig. 5). The obstruction was distal to the jejunojejunostomy passage and was produced by a congenital defect in the mesentery through which about 15 feet of small bowel had herniated. It was located midway between the ligament of Treitz and the cecum. Moderate constriction of the bowel by the hernial ring was responsible for the partial obstruction. The hernia was reduced, the defect in the mesentery was repaired, the three anastomoses were cut apart, and the six stomas thus produced were closed, restoring the gastrointestinal route to normal.

Although the operation lasted for three hours and the patient appeared to be a poor operative risk because of his long illness and extreme emaciation, the postoperative course for the next few days was remarkably uneventful. The temperature remained normal, the pulse rate did not rise above 80 and almost no abdominal pain was experienced. Borborygmus was no longer audible. Wangensteen drainage was discontinued May 19, when the patient began to eat well. May 20, however, mild diarrhea developed, followed by slight fever the next day. The abdomen, which had not been distended after the operation, again became tense, abdominal pain followed and the temperature and pulse rate rose. In spite of the reinstitution of Wangensteen drainage, numerous blood transfusions and the parenteral administration of adequate amounts of fluid, the patient grew steadily worse, and he died May 27, eleven days after the operation.

Autopsy.—The essential pathologic changes found at necropsy by Dr. Otto Saphir were a perforation of the recently closed stoma in the terminal part of the ileum with generalized fibrinopurulent peritonitis, severe edema of the myocardium, severe intraneural connective tissue edema and myelin sheath degeneration of the peripheral nerves, and caseous tuberculosis of the periaortic and peritracheal lymph nodes with encroachment on the tracheal wall.

The stomach, which had been enormously distended at the operation eleven days earlier, had contracted to normal size.

The rugae were elevated, coarse and hyperemic, indicating that chronic hypertrophic gastritis was present. A recent ulcer was found in the stomach immediately adjacent to the more distal freshly closed stoma, but this had not perforated. The duodenum just beyond the pylorus contained two diverticula with intervening scar tissue, evidently the site of the old duodenal ulcer. In the region of the three recently closed ostia in the proximal part of the jejunum, a puckering of the mucosa constricted the lumen to some extent. The ostium in the ileum, through which intestinal contents had escaped, contained some loose and some broken sutures.

The heart weighed 250 Gm. and its shape was normal. In microscopic sections in some areas the muscle fibers were disrupted and more or less replaced by loose areolar connective tissue in which were numerous small empty spaces, while in other areas the cross striations were obscure and the muscle fibers granular and atrophic (fig. 6).

The brain and spinal cord were normal. In sections of peripheral nerves (fig. 7) marked edema was seen between the individual nerve fibers. Between the nerve bundles, edema and an increased amount of loose areolar connective tissue were present. Vacuolization and fragmentation of some of the nerve fibers and the presence of many large mononuclear cells were noted. In Weil myelin sheath stains, swelling and fragmentation of some of the myelin sheaths, with much replacement of the nerve fibers by connective tissue, were observed.

All the voluntary muscles were severely atrophied, and cloudy swelling was present in some of the fibers.

Tubercles were found in the peritracheal and periaortic lymph nodes and in those surrounding the right common carotid artery as it ascends into the neck. A solitary tubercle was seen in the spleen. In a microscopic section of the trachea, the encroachment of the caseous tubercles on the lumen was confirmed by the complete absence of cartilage and the presence of necrotic material immediately beneath the mucosa.

COMMENT

Nutritional Deficiencies.—In view of the cause of the subvitaminosis B₁ it was reasonable to suppose that other dietary deficiencies might be present. No means for testing the adequacy of vitamin A nutrition were available other than observation of the skin and conjunctivas, which were normal. Pellagra was not present, since the patient did not have dermatitis or stomatitis, and neither the gastrointestinal nor nervous symptoms were characteristic of this disease.



Fig. 7.—Section of peroneal nerve. Note the edema between the nerve fibers and nerve bundles and the increased amount of areolar tissue between bundles.

Furthermore, the gastric juice contained 18 units of free and 84 of total acid. Yeast cells were seen in the gastric contents, confirming the presence of free hydrochloric acid. No clinical evidence of scurvy was observed. Adequate tissue saturation with vitamin C was confirmed by the excretion of 65 mg. of ascorbic acid in the urine in twenty-four hours with the patient

on his usual diet, the normal daily urinary excretion being from 30 to 45 mg. The presence of vitamin D in adequate quantity is indicated by levels for blood calcium of 9.3 mg., for blood phosphorus of 2.6 mg. and for serum phosphatase of 3.4 units, all within normal limits for adults.

Although no other vitamin deficiency was found, other types of deficiency were present. The total blood protein content March 7 was only 5.4 Gm. per hundred cubic centimeters, with 3.4 Gm. of serum albumin and 2.0 Gm. of serum globulin. Possibly the edema was to some extent a result of hypoproteinemia, although its rapid disappearance with thiamin therapy without change in the diet indicates that it was more likely cardiovascular in origin. Another evidence of some type of deficiency was the persistence of hypochromic, macrocytic anemia in spite of daily parenteral doses of liver extract for several weeks and iron given both by mouth and parenterally. Only 0.5 per cent of reticulocytes were present March 15 even with the stimulus of liver therapy. This is less than the percentage found in normal blood. The red cell count and hemoglobin content remained essentially unchanged until a blood transfusion was given April 22, when they rose slightly. A more marked rise to 4,740,000 with a hemoglobin content of 80 per cent occurred after a second transfusion May 12. The breaking of the teeth was probably also a result of some type of nutritional deficiency, the nature of which we do not know.

The most striking evidence of insufficient absorption of food was the failure of the patient to gain weight. In spite of a high caloric, high protein, high vitamin diet his weight remained about 94 pounds (42.6 Kg.) during more than two months in the hospital. Yet food stayed in the gastrointestinal tract long enough for absorption to take place, for bowel movements, though copious, ordinarily did not occur oftener than once a day. At first we thought that some of the gastrointestinal symptoms might be a result of the subvitaminosis B₁, but the longer we observed the patient the more apparent it became that partial obstruction must be present.

Dosage of Thiamin.—At first a daily dose of 25 mg. was given to make sure that the patient was receiving an adequate amount of the vitamin. This was later reduced to 10 mg. daily, and progress was just as rapid with the smaller as with the larger dose.

Hernia of the Mesentery.—The type of mesenteric hernia found in this patient, involving the upper portion of the jejunum, is exceedingly rare. In 1932, only thirty-two cases had been reported in the literature.¹ Although it may have been a congenital defect, presumably it produced no symptoms until January 1937. All the preceding gastrointestinal symptoms can be accounted for on the basis of the old duodenal ulcer, but during and subsequent to January 1937 the symptoms were probably a result of low grade obstruction produced by the unrecognized hernia, complicated by the various anastomoses. The enormous size of the stomach was probably a consequence of the intestinal obstruction rather than of the old ulcer, since the stomach had returned to its normal size within eleven days after the relief of obstruction, though the ulcer had not been touched.

Cardiac Changes at Autopsy.—The microscopic cardiac and nervous changes are typical of both experimental and clinical vitamin B₁ deficiency. Those in the nerves were to be expected, for function was still greatly impaired in spite of the prolonged treatment. Those in the heart, however, were not anticipated, for the heart had been clinically normal since the end of the first month of thiamin therapy and no enlargement of its right side was found on gross examination.

Tuberculosis.—The caseous tuberculosis was an entirely unexpected observation. The patient's temperature had risen to 100 F. and the pulse rate to from 90 to 100 a minute a number of times during his period of hospitalization, but this was attributed to a reaction to the injections of liver extract or to cachexia. It is probable, however, that it was actually a manifestation of tuberculosis and that the tuberculosis was a consequence of the severe and prolonged undernutrition.

SUMMARY

Wet beriberi was a result of impaired absorption of vitamin B₁ as a consequence of a partial intestinal obstruction caused by a hernia in the mesentery, complicated by a gastrojejunostomy and a : diagnosis was confirmed by the improvement of the patient under thiamin therapy and by autopsy.

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TULAREMIC INGUINAL BUBOES FOLLOWING TICK BITES

REPORT OF TWO CASES

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NEW ORLEANS

A bubo in one or both groins associated with fever is common. It is usually presumed to be of venereal origin. Frequently it occurs with pyogenic infections of the lower extremities, scrotum, perineum or pubis. The local lesion may be so small as to be overlooked or so slight as to be disregarded as the cause of the lymphadenitis. In certain localities bubonic plague must always be kept in mind.

Six cases of tularemic inguinal lymphadenitis following tick bite have appeared in the literature.¹ The two cases reported here illustrate that clinically the disease may be readily mistaken for any of the types of bubo mentioned.

CASE 1.—History.—A white man aged 23 was sent to the hospital May 8, 1937, from the CCC Camp at Bogalusa, La., because of fever and bilateral inguinal lymphadenitis. On admission his temperature was 39.7 C. (103.4 F.) and the pulse rate 120. He had some pain in both groins, which was augmented by walking. The distal superficial subinguinal nodes on the right side were enlarged and beginning to fuse. The mass measured 4 cm. in diameter. It was freely movable and tender

The Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, furnished the photographs of the ticks.

1. These were reported by:

- Magath, T. B., and Yater, Wallace M.: Three Cases of Tularemia. *M. Clin. North America* 10: 745 (Nov.) 1926.
- Kerlin, W. S.: Tularemia: Review of Literature with Report of Case. *New Orleans M. & S. J.* 81: 723 (April) 1929.
- Hanson, E. C., and Green, R. G.: Tularemia in Minnesota. *J. A. M. A.* 92: 1920 (June 8) 1929.
- Schultze, V. E., and Marr, W. L.: Tularemia in Texas. *Texas State J. Med.* 29: 643 (Feb.) 1934.
- Miller, J. W.: Tularemia: Report of a Case. *Proc. Staff Meet., May 2* Clin. 13: 494 (Aug. 3) 1938.

1. Edwards, C. R.: Acute Intestinal Obstruction Due to Mesenteric Defects Requiring Massive Resection. *J. A. M. A.* 99: 278 (July 23) 1932.

on pressure. The skin was not changed. The corresponding nodes on the left side were enlarged, discrete and tender. The largest measured 1.5 cm. in diameter.

For the past five days the patient's appetite had been poor and he was nauseated. He had vomited once. May 6 he had some pain in the right groin and found a tender "kernel." Later that day his left groin became painful. The venereal history



Fig. 1.—Tularemia: bilateral primary lesion.

was irrelevant. May 10 the patient was given the Frei test and reexamined. At this time a superficial ulcer 5 mm. in diameter covered by a thin black scab was found on the antero-medial aspect of the right leg just below the knee. A similar but apparently more recent ulcer was present on the lateral surface of the lower third of the thigh. Numerous scratches, excoriations and pinpoint pink papules were present on both legs. Inquiry about these lesions disclosed that the patient worked in underbrush where ticks were plentiful. At night he often removed as many as thirty ticks from his body. He first noticed the sore on his right leg when his groin became painful. He attributed this to scratching. When his attention was called to the ulcer on the thigh, he stated that it was "just a pimple several days ago."

Laboratory Data.—The leukocyte count was 8,500 per cubic millimeter, with a differential count of 69 per cent polymorphonuclears, 23 per cent lymphocytes, 6 per cent monocytes and 2 per cent eosinophils. The Wassermann, Kahn and Frei tests were negative. Smears and cultures of material from the ulcers and of the pus aspirated from the bubo in the right inguinal region showed no micro-organisms. Three guinea pigs inoculated subcutaneously with pus and brought to autopsy after nine, eighteen and twenty-seven days, respectively, showed no lesions.

The macroscopic tube agglutination test for *Bacterium tularensis* with the patient's serum May 20 with a titer of 1:320 showed complete agglutination, June 3 with a titer of 1:640 complete agglutination, June 18 with a titer of 1:1,280 complete agglutination and with a titer of 1:2,560 partial agglutination, and June 26 with a titer of 1:2,560 complete agglutination and with a titer of 1:5,120 partial agglutination.

After I obtained this high and progressively rising agglutination titer, more pigs were inoculated with pus from the right bubo, again with negative results. When I spoke with

Dr. Edward Francis about this case, he informed me that pus from suppurating lymph nodes infected with *Bacterium tularensis* rarely yields the micro-organism on culture or produces infection in guinea pigs after the first month of illness.

Course.—The patient was decidedly ill. The fever continued for twenty-five days with morning remissions and evening rises in temperature to 38 or 39 C. (100.4 or 102.2 F.). The whole group of superficial inguinal nodes on both sides became involved and very painful. They formed huge doughy and fluctuant buboes. The skin was intensely red, edematous and adherent. Later it showed hemorrhagic and purplish discoloration and was very thin over the dome of the buboes. After three weeks of progressive suppuration the right bubo burst, discharging blood-streaked yellow creamy pus and sloughs of necrotic tissue. The bubo on the left side was aspirated and incised. Ugly, indolent wounds resulted. These healed after a number of weeks of energetic and varied treatment.

CASE 2.—History.—A white man aged 22 was sent to the hospital May 28, 1937, from the CCC camp at Springville, La., because of fever, chills, and inguinal lymphadenitis on the right side. On admission the temperature was 38.8 C. (101.8 F.) and the pulse rate 96. A subinguinal bubo 5 by 7 cm. in diameter was present on the right side. It was painful, tender on pressure and fluctuant in areas. The skin over the bubo was freely movable and not altered. The bubo had been developing for two weeks. In the past few days it had become painful, and the patient had chills, fever and a cough and ached all over. His head ached severely.

Long-standing dermatitis venenata due to poison oak was present over both legs. Small faint papules and excoriations were present over the legs, thighs and lower part of the abdomen. The patient stated that these were due to ticks, which he removed from his body daily after working in the woods

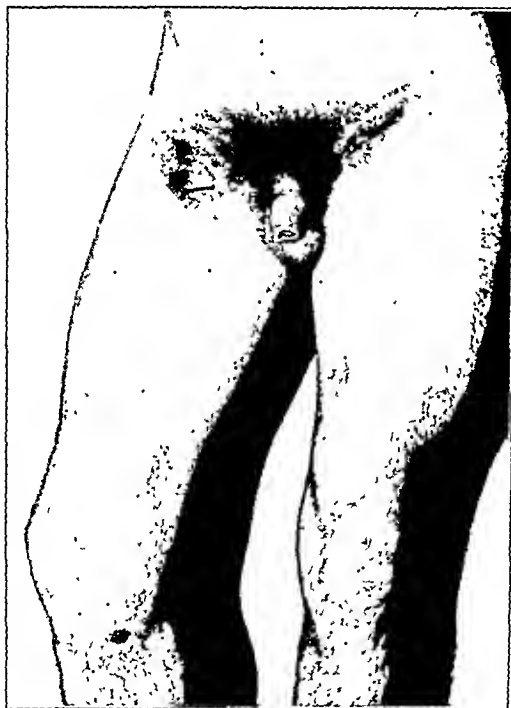


Fig. 2.—Bubonic tularemia, showing hemorrhagic discolorations of the skin over the buboes.

Three days previously he had removed a tick that was deeply embedded in the right scrotal fold, and he found one on the back of the scrotum after entering the hospital. The venereal history was irrelevant.

Laboratory Data.—The leukocyte count was 7,600 per cubic millimeter, with a differential count of 68 per cent polymorphonuclears, 27 per cent lymphocytes and 5 per cent monocytes. The Wassermann, Kahn and Frei tests were negative. The macroscopic tube agglutination test for *Bacterium tularensis*

with the patient's serum May 29 with a titer of 1:640 showed complete agglutination, June 12 with a titer of 1:640 complete agglutination and with a titer of 1:1,280 partial agglutination, and June 29 with a titer of 1:1,280 complete agglutination.

Pathologic Study of the Excised Bubo.—The gross specimen consisted of six lymph nodes, of which the smaller were discrete and the larger partly matted together. The largest node measured 2.7 cm. in diameter. The nodes were soft and the

Course.—The fever continued with morning remissions and evening elevations in temperature to 37.8 or 38.6 C. (100 or 101.4 F.) for over three weeks, until it was decided to excise the bubo. During this period it enlarged only slightly, but it became considerably softer and in areas markedly fluctuant. The skin was purplish and thin over the areas of fluctuation.

Within a week after the bubo was excised the patient became afebrile and began to improve. The wound healed slowly.

COMMENT

Francis² has pointed out that certain ticks are important agents in the transmission of tularemia. Wood ticks, *Dermacentor andersoni*, have caused the disease in fifty-three cases in Montana and the surrounding states. The dog tick, *Dermacentor variabilis*, has caused it in more than sixty-five cases in the Southern states, and in several cases it has been attributed to the Pacific Coast tick, *Dermacentor occidentalis* Neum.³ Probably a number of other species of ticks play a part.

These ticks are biologic hosts for *Bacterium tularensis*; that is, the infection acquired in one tick stage is passed on to the next, thus insuring perpetuation and spreading the disease among lower animals and thereby increasing the danger to man.

Ticks bite under the clothing or in the hairy areas of the body, where they may escape notice for long periods. The perineum and genitalia are favorite sites of tick bite. Francis⁴ stated that he had had a dozen

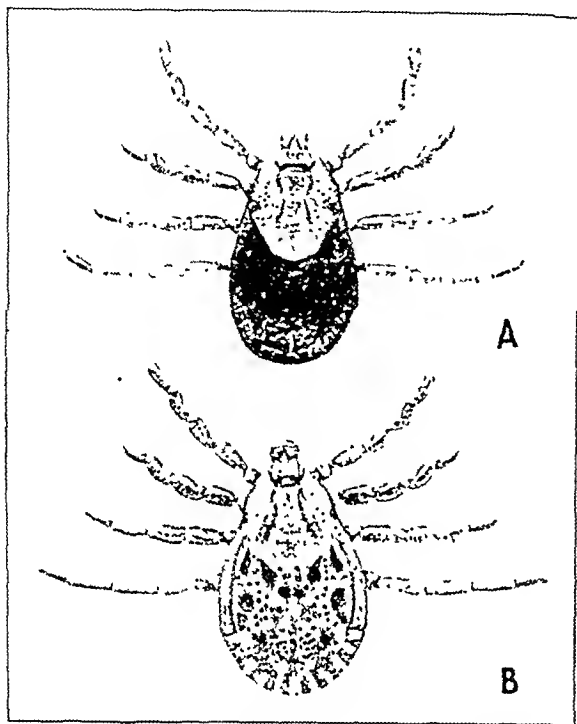


Fig. 3.—*Dermacentor andersoni*, A, female, B, male.

periaidenoid tissue was hemorrhagic. On section the parenchyma was pink and mottled with milky gray and red flecks.

Microscopically the lymphadenoid architecture was largely suppressed or obliterated. Large and small foci of early and advanced caseation containing aggregates of intact and degenerated polymorphonuclears were present in the large nodes. These were margined by mantles of palisaded epithelioid cells. Occasional epithelioid granulomas and areas of diffuse epithelioid cell proliferation were present. Some of these showed beginning coagulation necrosis.

Infiltrations of polymorphonuclears and small numbers of monocytes and plasma cells were present throughout the parenchyma in all nodes. The sinuses were dilated and filled with serous exudate containing polymorphonuclears, lymphocytes and macrophages. Capillary vascularization of the parenchyma, irregular fibroblastic overgrowth, intense congestion and foci of hemorrhagic extravasation were present. An occasional focus of reticulum cell hyperplasia was seen. Fibrin was demonstrable in the margins of an occasional focus of beginning caseation.

The capsules and periaidenoid tissue were overgrown by hemorrhagic vascular granulation tissue that showed focal abscessing and diffuse suppuration, dense lymphocyte infiltration and small numbers of monocytes and plasma cells. Fibrin was demonstrable in areas.

Many Langhans giant cells were present throughout the parenchyma, associated with and apart from the granulomas. Some were also present in the periaidenoid granulation tissue.

The small and medium sized arteries showed diffuse edema and lymphocyte infiltration of their entire wall, various degrees of adventitial fibroblastic overgrowth and intimal proliferation with stenosis of the lumen.

Micro-organisms were not demonstrable in sections stained by the Gram, Gram-Weigert, buffered Romanowsky or Ziehl-Neelsen method or the Nile blue sulfate method advocated by Foshay.

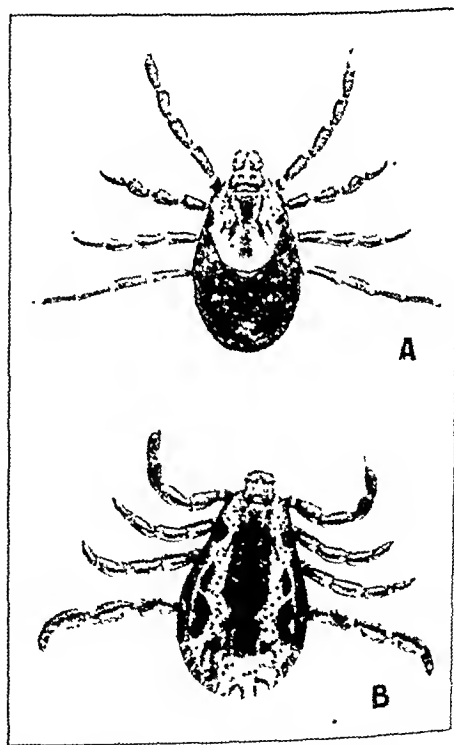


Fig. 4.—*Dermacentor variabilis*, A, female, B, male.

reports by letter of inguinal lymphadenitis that followed the bite of infected ticks in these areas. In several cases the adenitis was bilateral. In one of these the ulcer was present at the midline over the coccyx and in one over the pubis, in one there were multiple

2. Francis, Edward: Sources of Infection and Seasonal Incidence of Tularemia in Man, Pub. Health Rep. 52: 103 (Jan.) 1937.
3. Bishopp, F. C.: Ticks and the Role They Play in the Transmission of Diseases, Washington, D. C., Smithsonian Institution, Annual Report 1935, pp. 389-406.
4. Francis, Edward: Personal communication to the author.

perineal ulcers and in one there was an ulcer on each leg, from which sites seed ticks had been removed several days previously.

The buboes in the two cases here reported occurred in May within three weeks of each other. The infection is seasonal, owing to the periodic prevalence and activity of the ticks and probably also to game laws.

From March to August are the months recorded for the onset in fifty-three cases of tularemia due to the wood tick, *Dermacentor andersoni*. These months correspond with the season of greatest activity of this species. This tick becomes infected in the larval or nymphal stage by feeding on infected rodents, and as an adult it infects man when it feeds on him. It has been found to feed in its various stages on a large variety of animals, the most important hosts of the immature stages being mice, ground squirrels and pine squirrels, while the adults feed mainly on larger wild and domestic animals.

From January to October are the months recorded for the onset in fifty-three cases of tularemia due to the dog tick, *Dermacentor variabilis*. The disease is widely distributed over the eastern two thirds of the United States and also occurs in California. In distribution therefore it almost occupies the portions of the United States not covered by the wood tick, *Dermacentor andersoni*. It is especially abundant along the coast from Cape Cod to the extreme southern part of Texas. It is troublesome as a parasite of dogs, horses, cattle, rabbits and man.

The wood tick, *Dermacentor andersoni*, and the American dog tick, *Dermacentor variabilis*, are related species. They resemble each other in general appearance, and their habits are similar. These ticks are especially abundant in wooded areas which are heavily overgrown with vines and underbrush. This condition not only gives the ticks protection but also protects the small wild rodents on which the young ticks feed. This at once suggests the desirability of cleaning out undergrowth and destroying small wild rodents in the vicinity of habitations and camps. In areas where hawks, owls and other predatory birds abound, removing the brush exposes the rodents to the attack of these birds.

It is stated that tick bites can be avoided by wearing proper clothing to exclude the ticks. Too much dependence, however, should not be placed on the exclusion of ticks, and the body should be thoroughly examined at frequent intervals when one is walking or working in tick-infested areas. Special attention should be given to the examination of the scalp and other hirsute areas of the body.

The number of ticks in a given area can be distinctly reduced by dipping infested dogs³ and other livestock in a suitable tick-destroying solution or, in the case of pet dogs, by systematically picking the ticks from the animals to prevent the dropping of any engorged females. In removing ticks from dogs it should be borne in mind that the mere handling of an infected tick may cause infection, because *Bacterium tularense* can penetrate the unbroken skin. Hence the ticks should be picked off with forceps and the hands well washed with antiseptic solution.

Ticks removed from boys at the CCC camps in southern Louisiana from time to time were identified as the dog tick, *Dermacentor variabilis*, and the lone star tick, *Amblyomma americana*. A number of times

ticks of both species were ground up and inoculated into guinea pigs. After weeks of observation the animals were well and showed no lesions at autopsy.

Diagnosis.—A bubo in the groin or regional lymphadenitis anywhere, when associated with fever, an ulcer of the skin or excoriations and scratches resulting from insect bites and coupled with a history of tick bite or fly bite (*Chrysops discalis*) should suggest tularemia. The agglutination of *Bacterium tularense* by the patient's serum in a dilution of 1:80 or higher is considered diagnostic of tularemia, provided there is no cross agglutination with *Brucella abortus* and *Brucella melitensis*.

SUMMARY

Bubonic tularemia of the groin is clinically similar to other types of inguinal bubo. The pus of suppurating tularemic buboes will rarely yield *Bacterium tularense* on culture or produce lesions in guinea pigs. Regional lymphadenitis associated with fever, an ulcer of the skin or excoriations and scratches resulting from insect bites, coupled with a history of tick bite or fly bite, is suggestive of tularemia. The agglutination of *Bacterium tularense* by the patient's serum in a dilution of 1:80 or higher is considered diagnostic.

STERILE MOTILE SPERMATOZOA, PROVED BY CLINICAL EXPERIMENTATION

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NEW YORK

In May 1935 Mr. and Mrs. K. presented themselves with the problem of sterility. Both patients had been examined several times during their eleven years of married life. Neither husband nor wife had ever been operated on, nor had they at any time been ill other than with slight colds, and Mrs. K. with sinus trouble, which was a chronic condition, not severe enough to warrant operation. The last examination that they had undergone in an endeavor to determine the reason for their sterility occurred eight months before they presented themselves to me for reexamination.

Mr. K. was examined first and found to be in excellent health. A specimen of seminal fluid was obtained by withdrawal, the material being collected in a sterile pyrex beaker. The count revealed 94,000,000 spermatozoa per cubic centimeter of fluid, abnormal forms 3 per cent, motility index eighteen hours, fertility index (?) and pus absent. The spermatozoa were very active with markedly active use of the tail, movements of which were exceedingly rapid. With interference of viscid mucus obtained from the wife's cervical mucous plug, the spermatozoa, after becoming entangled, persisted for as much as an hour and a half to penetrate the obstruction. This, by the ordinary criterion that has been used to date, would have exonerated Mr. K. of any part in the sterility.

Mrs. K. was then examined. Her organs were freely movable on bimanual examination. There was no history of any pelvic abnormality; the menstrual cycle was normal; her weight and height were normal for her age, 38. Her mother did not cease menstruating until she was 49. The siblings in her family, two brothers and one sister, all had one or more children.

First reported at a sectional meeting of the Department of Urology, Brady Foundation, Cornell Medical Center.

A uterosalpingogram showed tubal patency and normal conformation of the uterus. The basal metabolic rate was plus 7. Wassermann reactions of the blood were negative in both husband and wife and the other blood work, including tests with follicle stimulating and luteinizing factors, gave negative results. Urinalysis showed no evidence of disorder; hemoglobin was 95 per cent in the Sahli test, the red blood cell count 4,750,000 and the white blood cell count 6,700. The differential count was normal. A series of sedimentation rates taken over a period of several weeks showed no marked vacillation. Mrs. K. was normal in every way. The Huhner test showed viable spermatozoa in the cervical canal.

Mr. K. is a professor in a nearby university and is constantly subjected to the grueling effects of university routine. He had been constantly in harness during the eleven years of his married life. Mrs. K. herself is a college graduate, highly trained, and assists her husband in his research work. Their life is principally taken up with intellectual matters, although they play some tennis.

Having found nothing that would lead one to suspect it as the cause of the sterility, neither of them showing any manifestation of endocrine dysfunction, both being of normal weight and normal habits, there was only one factor for consideration—the question of devitalization

London, relaxing completely and enjoying their vacation. However, October 1936 showed no improvement. There was only one significant deviation from the original examination in that the motility index had increased from eighteen hours to twenty-one hours.

It was decided at this time that, with the wife's consent, if a sufficient number of volunteers could be found, to cross inseminate them with Mr. K's spermatozoa to determine definitely whether the spermatozoa were fertile or not. Children by Mr. K. would have been highly desirable, since he has an intelligence quotient of 140, which throws him into the genius group. During the next year and a half we were able, with the consent of the women and their husbands, who were sterile, to start these inseminations on sixteen women. It was with their consent and knowledge that the spermatozoa of Mr. K. were used, although in many instances his nationality, religion and aptitude differed markedly from those of the sterile husband. In the next six months period spermatozoa were obtained from Mr. K. and the patients were artificially inseminated monthly. No pregnancies ensued.

At the end of this time it was decided, and consent was received from the participants in the experiment, that I should now use a donor whose fertility index was known. A man with an intelligence quotient of 120 was chosen—a man who was already the father of two

Results of Artificial Insemination

Case.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Years married.....	11½	2	4	9	10	5	5	4	7	1½	5	18	6	6	8½	5	3
Age.....	38	23	30	40	39	32	35	28	38	22	33	40	34	39	36	31	27
Crossed with Mr. K's sperm on sixth, tenth, twelfth and fourteenth days of period, from October 1936 to March 1937																	
Pregnancies.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
April 1937, second donor used.....		P.									P.						P.
May 1937.....			P.														
June 1937.....										P.							
September 1937.....																P.	
October 1937.....		P.															
November 1937.....				P.													
December 1937.....									P.								
January 1938.....						P.											
February 1938.....													P.				
March 1938.....							P.										
April 1938.....					P.							P.					
May 1938.....												P.					
September 1938.....														P.			
October 1938.....								P.									
Sex of child born.....	♂	♂	♂	♂	♀	♂	♂	..	♂	♂	♀	..	..	♂	..	♂	♂

Inseminated
6th, 10th,
12th and
14th days

Inseminated
2d, 4th and
5th days

with a resultant lowered fertility index to such a degree that fertilization could not occur; that is, if such a condition actually exists. With this in mind, the patients were subjected by their local physician to biweekly and then weekly ultraviolet irradiations between November 1935 and May 1936. The diet was also drastically altered, with incorporation of a great deal of raw vegetables, such as salads and grated carrots and beets, all sorts of raw fruits, raw onions sliced and boiled onions. Meats and salads were spiced with an unusual amount of condiments and garlic. In addition, fish was eaten three times a week and considerable crustacea. Both the husband and the wife retired at an early hour, and afternoon rests became a habit. In addition there was a large daily dose of irradiated ergosterol, and, for Mr. K., weekly doses of testicular extract administered intragluteally, in increasing doses. However, with all this rest and therapy, by May nothing had happened. The patients then consented to a change of environment. Forthwith they went for their three months summer vacation to England, spending it in a rural suburb of

children and whose wife practiced birth control. He was an eminent figure in his profession. His wife was also a college graduate, a highly intelligent person. They both realized the importance of the experiment and gave their full hearted cooperation. The viability index of the donor's sperm was thirty-one hours. Because of the uncertainty of the exact time of ovulation, it was thought best to have four inseminations each month on the sixth, tenth, twelfth and fourteenth day of each intermenstrual period, the first day of the period being considered as one. The frequency of these inseminations and the thirty-one hour viability index of the donor's spermatozoa gave reasonable assurance that the sperm would overlap the periods between inseminations. Another factor that came up later was that subjects 8, 13 and 15 would not take between these periods. After eleven months it was decided in these three cases to alter the days, which may be seen in the accompanying table.

The sixteen volunteers and the wife of Mr. K. were artificially inseminated over the next fourteen months,

when the rest of the volunteers, including Mrs. K., had become pregnant. The table shows the exact time at which each of the seventeen women became pregnant, the pregnancy being verified after the missing of the next monthly period and a positive Friedman reaction being obtained. The importance of this series is principally that motility of spermatozoa does not necessarily indicate fertility and that the retrieving of viable spermatozoa after coitus from the cervical canal does not exonerate the man as a cause of sterility.

The fertility index of spermatozoa may not be judged by conformity of the count per cubic centimeter, by ascertainable motility or by any of the other physical factors, diagnosable by ordinary microscopic examinations.

53 East Ninety-Sixth Street

Clinical Notes, Suggestions and New Instruments

ROCKY MOUNTAIN SPOTTED FEVER WITH UNUSUAL FEATURES

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This is the report of a case of Rocky Mountain spotted fever, with observations made at autopsy, which is of unusual interest with regard to (1) mode of infection, (2) character and distribution of the rash, (3) lateness of appearance of the rash and (4) jaundice.

REPORT OF CASE

History.—M. F., aged 23, a white, married, unemployed American woman, admitted to Emergency Hospital June 7, 1938, complained of headache, chills and fever of four days' duration. She had been perfectly well until the afternoon of June 4, when she was taken with severe frontal headache and burning of the eyes. Shortly thereafter aching in her chest and legs and a slight cough developed. During the night she had a shaking chill followed by a rise in temperature and a drenching sweat. These symptoms continued, and the day before admission a decrease in auditory acuity, without carache, developed. The morning of admission she became nauseated and vomited and could not retain water. She stated that she had not been out of the city recently, had been drinking only city water and pasteurized milk and had eaten the usual cooked foods.

Her past and family histories were noncontributory.

It was later learned from the family that the patient had removed a tick from her husband about ten days prior to her illness. The husband, who was in good health, had recently hutch-hiked north from Florida.

Examination.—On physical examination the patient was well developed and fairly well nourished and was lying quietly in bed, alert and cooperative. The skin was hot and moist, and there was a suggestion of mottling over the abdomen (heat had been applied). Marked anterior flexion of the head elicited a slight pain down the back of the neck. There was moderate tenderness over the orbital rims; the scleras were clear; the nasal mucosa was injected; the lips were parched. The knee jerks were moderately hyperactive and there was an abortive ankle clonus. The Babinski and the Kernig sign were not present. The temperature was 103 F., respiratory rate 20, pulse rate 104 and blood pressure 115 systolic, 70 diastolic. The rest of the physical examination revealed no abnormalities.

Subsequent Course.—The patient continued to have a high fever, to have severe sweats and to grow progressively weaker. June 12, the ninth day of her illness, there were several petechiae in the conjunctivas and on the buttocks. June 13 there was a mottled maculopapular rash over the trunk, shoulders and upper parts of the thighs. By June 14 these areas had become petechial and were present on the upper arms.

There was never any rash on the face, hands or feet. The lesions were discrete pinpoint to pinhead sized petechiae which did not fade on pressure. They were most numerous over the back and buttocks. On the day the petechiae were first seen, the patient showed decreased mental alertness, which progressed slowly to a stupor. On the morning of June 14 the scleras were icteric, and during the course of the day the skin became icteric. About 4 a. m., June 15, the patient became restless and anxious and went into coma, death following shortly thereafter.

The temperature ranged from 102 to 104 F. with occasional sudden drops to subnormal following severe sweats.

Examinations of the blood revealed: June 7: hemoglobin 90 per cent, erythrocytes 5,000,000 per cubic millimeter, leukocytes 7,550 per cubic millimeter with 98 per cent polymorphonuclears. June 13: hemoglobin 90 per cent, erythrocytes 4,470,000 per cubic millimeter, leukocytes 14,300 per cubic millimeter with 88 per cent polymorphonuclears. Agglutination of *Bacillus proteus* X 19 was positive in 1:80 concentration; of *B. abortus*, negative; of *B. typhosus*, negative and of *B. paratyphosus* A and B, negative. June 14: agglutination of *B. proteus* X 19 was reported negative by the United States Public Health Service. Spinal fluid June 7 and 12 showed 5 and 7 cells per cubic millimeter respectively. Blood culture, the Wassermann reaction, examination of the urine and x-ray examination of the chest were negative. June 14 guinea pigs were injected with the patient's whole blood and from them was isolated the virus of Rocky Mountain spotted fever. The virus conformed to the strain isolated from patients with the Eastern form of Rocky Mountain spotted fever.¹

Autopsy.—This was performed by Drs. R. D. Lillie and T. L. Perrin of the United States Public Health Service.

Gross Appearance: The body was well developed. There was a general icterus of the skin, and numerous small petechial hemorrhages were present over the trunk, upper arms and thighs. The breasts appeared normal. On section there was a large hemorrhage in the left rectus muscle. The peritoneum was smooth and glistening. On the surface of the intestine were pinpoint sized hemorrhages. The visceral pleura was studded with pinhead sized hemorrhages over the left lower and right middle lobes of the lungs. There was a small amount of bloody fluid in the right pleural cavity. The visceral pericardium also showed numerous petechial hemorrhages.

The right ventricle of the heart was soft and distended with blood. The left ventricle was contracted. The valves were normal. There was marked congestion of both lower lobes of the lungs. The hilus nodes showed mild anthracosis. The spleen weighed 425 Gm. and was dark red and moist on section. The stomach contained some dark brown thin fluid, probably altered blood. The mucosa showed many pinpoint sized hemorrhages. The pancreas was normal. The liver was about normal in size. On section there was a slight yellow and brown lobular mottling. The gallbladder was moderately distended with very dark bile that could not be expressed into the duodenum. A probe could not be passed without making a false passage. No stones were found. The adrenals were normal. The size of the kidneys was normal. Many petechial hemorrhages were present in the pelvic mucosa. There was a small amount of blood in the uterine cavity. Several small hard white nodular tumors from 3 to 5 mm. in diameter were found in the ovaries. The bladder was distended with urine, which gave a yellow foam on shaking. The mucosa was studded with petechial hemorrhages. The mucosa of the intestine showed many petechial hemorrhages. The fecal material in the colon was clay colored.

Gross examination revealed: (1) petechial eruptions in the skin, in the serous membranes including the visceral pleura, pericardium and peritoneum and in the mucosa of the gastrointestinal tract, renal pelves and bladder; (2) icterus; (3) splenomegaly, and (4) congestion and edema of the lungs.

Microscopic Appearance: In the epicardium and myocardium and beneath the endocardium there were many small focal hemorrhages; also areas of vascular endothelial swelling, adventitial proliferation of fibroblasts and moderate perivascular

1. Performed by Dr. R. E. Dyer of the United States Public Health Service.

A BEDSIDE METHOD FOR DETECTING
DEXTROSE IN THE URINE

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Benedict's test for dextrose in the urine can be simplified for practical bedside purposes by using the solution dried on a wad of asbestos and applied to the end of a wooden applicator.

Asbestos paper soaked in Benedict's solution is molded onto the end of a wooden applicator, again thoroughly moistened with the solution and then allowed to dry in air. The test is then carried out by dipping the end of the applicator into the urine or by merely allowing two drops of urine to fall on the end of the asbestos and then gently heating the urine-moistened asbestos over a noncharring flame (Bunsen, stove range, alcohol lamp). A yellow color develops, the intensity of which depends on the concentration of dextrose in the specimen.

A rapid method using asbestos paper and bismuth salts and requiring heat for completion has been devised by Mr. Harold Wright¹ of Forest Hills, N. Y., but this has the disadvantage of being rather cumbersome to make up. Recently the Denver Chemical Manufacturing Company has put out its "galatest" for rapid detection of dextrose in urine with the salts of bismuth. The latter test seems to be rapid and accurate and has the advantage of not requiring heat for its completion but the disadvantage of using caustic materials.²

In the manufacture of my asbestos applicators I have used standard Johns-Manville asbestos paper one thirty-second inch thick. The paper is cut into strips and soaked in Benedict's solution for twenty-four hours. At the end of this time pieces of the soaked paper about the size of an almond are molded on the end of wooden applicators, again moistened in the Benedict's solution and allowed to dry in air. Applicators thus made may be stored at least three or four months without loss of their sensitivity. In carrying out the test it is necessary to dip the asbestos tip of the applicator into the specimen of urine or apply two drops of urine, so that on the completion of the test a yellow line of demarcation is noted between the moistened and the unmoistened portions of the applicator if the test is positive.

Any source of heat that does not deposit soot on the surface of the asbestos may be used to carry out the test. It is important to avoid the direct heat of the flame to prevent charring.

The applicability and sensitivity of the method were tested by examining graded concentrations of dextrose in normal urine

*Association of Color Gradations with Concentrations
of Dextrose*

Concentration	Color
3 per cent or more.....	Orange
From 1 to 3 per cent.....	Canary yellow
From 0.5 to 1 per cent.....	Greenish yellow
From 0.1 to 0.5 per cent.....	Faint yellow on a green background
0.07 per cent.....	No change

ranging from 0.6 to 5 per cent. In these experiments definite color gradations were associated with the concentrations of the dextrose given in the accompanying table.

The cost of the materials required for the test is minimal. The asbestos paper costs 10 cents a pound and the wooden applicators 10 cents a hundred. I have calculated the cost of a single asbestos applicator to be 0.4 cent.

Tests of diabetic urine of known dextrose concentration, determined by more elaborate quantitative methods, showed an agreement with the results obtained with the asbestos applicators close enough for ordinary clinical purposes.

At no time did various specimens of normal urine give a yellow color with the asbestos test. Approximately 100 samples of normal urine were tested, and none gave a false positive

Cooperation was given the author by Dr. Eugene F. Du Bois and Dr. Gustave I. Steffen.
From the New York Hospital and Department of Medicine, Cornell University Medical College.

1. Wright, Harold: Personal communication to the author.
2. Dr. Albert Seaton of Indianapolis has devised a test using copper salts and heat, but the manufacture of his device is rather costly.

reaction. No other pathologic constituents of the urine, viz, blood and bile, interfere with the results of the test.

The applicators are as convenient to carry about as are tongue depressors, and both the physician and the patient are able by this rapid, inexpensive test to determine the approximate concentration of sugar in the urine within one minute.

Council on Physical Therapy

THE FOLLOWING ARTICLE HAS BEEN ADOPTED BY THE COUNCIL FOR PUBLICATION. THE COUNCIL EXPRESSES ITS APPRECIATION TO THE CONSULTANTS APPOINTED TO AID THE COUNCIL IN THIS INVESTIGATION FOR THEIR VALUABLE ASSISTANCE, TO THE NATIONAL BUREAU OF STANDARDS FOR ITS COOPERATION, AND TO THE AUTHORS FOR THE PREPARATION OF THIS REPORT.

HOWARD A. CARTER, Secretary.

RADON SEEDS

PHYSICAL CONSIDERATIONS: DO THEY LEAK
AND DO THEY IRRITATE TISSUES?

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AND

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PHYSICAL CONSIDERATIONS

A short time after radium was discovered, it was found that objects in the neighborhood of open radium preparations acquired a radioactivity of their own. This activity was very short lived if the object was removed from the vicinity of the radium but could be renewed at will by bringing it back.

This mysterious phenomenon is readily explained when the sequence of radioactive changes is known. Radium itself is a metal, belonging to the same chemical group as barium and calcium. The nucleus of the atom is, however, unstable, and at some (entirely unpredictable) time it suddenly ejects a portion of itself. This portion, which is called an alpha ray or alpha particle, is exactly like the nucleus of a helium atom. In any given quantity of radium, every instant a certain percentage of all the atoms present undergo this transformation, the rest remaining completely unchanged. The apparent result of this is that the quantity of radium present gradually decreases. But it must be remembered that this gradual decrease is the result of a series of sudden transformations.

When a radium atom has ejected an alpha particle, what is left behind is no longer radium but a new element, radon. This element is a gas, belonging to the same chemical family as helium. Being a gas, it need not remain with the radium atoms but can float away, remain for some time in the air or settle on some object. Radon is itself unstable. At some (also unpredictable) time after its formation, the radon atom expels an alpha particle. The residual atom is known as radium A and is another metal, belonging to the chemical group of selenium and tellurium. These metallic atoms settle on any nearby object, forming a film so thin as to be invisible. They, in turn, eject alpha particles, and this alpha radiation naturally appears to come from the object on which the radium A has settled; this is the "acquired radioactivity" mentioned in the first paragraph. When radium A disintegrates, its product is

From the Memorial Hospital, New York (Edith H. Quimby), and the Mayo Clinic, Rochester, Minn. (Dr. Desjardins).
Special report prepared for the Council on Physical Therapy of the American Medical Association partly as a result of a special investigation to determine the question of leakage.

another solid, as are all the subsequent ones. This element, called radium B, belongs to the same chemical family as lead.

Radium B disintegrates in a different manner from the preceding elements; it ejects an electron, known as a beta ray, or beta particle. Accompanying this particle are rays of the same sort as roentgen rays; these are called gamma rays. The next substance, radium C, emits all three types of rays in its disintegration.

It is evident that these radioactive substances are arranged in a family, or series. As a matter of fact, three such series are known, but only this one is of much practical importance in radiation therapy. This is called the uranium series, since its first member is uranium. Radium is the seventh member; for the present purpose its ancestors are of little significance. The part of the series which has been discussed, and which is all that is of interest in radiotherapy, may be condensed in a diagram as in figure 1.

Each member of the series is a true chemical element. It enters into combinations with other elements in accordance with the chemical group to which it belongs. Every one has its own characteristic manner and rate of disintegration, which for any given substance is always the same and is not influenced either by the chemical combination in which it exists or by the action of physical agents (such as heat and cold).¹

The three types of rays differ greatly in their penetrating powers. The alpha rays, which are helium nuclei traveling at high speeds, cannot penetrate to any appreciable distance in solid matter; in fact, they are all stopped by an ordinary sheet of paper. Evidently they may be ignored in radiation therapy. The beta rays, electrons traveling at considerably greater speeds than the alpha rays, are more penetrating. Many of them will pass through several millimeters of tissue; they are all stopped by 2 mm. of brass or 0.5 mm. of platinum or gold. They are of use in therapy only for extremely superficial conditions. The gamma rays are, like roentgen rays, electromagnetic radiations traveling with the speed of light, and they are very penetrating. Some of them can pass through several inches of lead. They are the ones which must be used to affect cells at distances of more than a few millimeters in tissue.

The problem of radiation therapy is to deliver a sufficient quantity of radiation to the cells it is desired to affect, without at the same time producing undesirable effects on other tissues. In radium therapy this implies an adequate amount of gamma radiation.

As stated, no gamma radiation is produced by radium itself or by its immediate descendants; the gamma rays come from radium B and radium C. If, however, the radium is in a sealed container, its decomposition products will accumulate there with it and their radiation can be attributed to it. If, on the other hand, the arrangement is such that the radon atoms can drift away (or be pulled away) as fast as they are formed, the radium would be seen to emit only alpha rays. Similarly, if radon is sealed into a tube so that its descendants must also remain there, their radiation can be attributed to it. It is evident that, as far as the available radiation is concerned, it makes no difference which is used; in either case it is the later members of the series which actually produce the useful rays.

Radium loses its activity very slowly. Of any given amount, half will have disintegrated in 1,590 years, or only a small fraction of 1 per cent a year. Of radon, however, half will have disintegrated in 3.82 days (16.6 per cent in one day). Of the half remaining, one half will disintegrate in another 3.82 days; of the amount now remaining (one fourth of the original amount) half will be lost in another equal period, and so on. It is evident that, whereas a supply of radium would be practically constant during one man's lifetime, a supply of radon would vanish very rapidly unless it was replenished. If, however, the radium could be put in a safe and allowed to remain there, and the radon drawn off every day, a continuous supply of active material would be assured. The radium would not be in danger of loss or theft; the loss of some radon would not be serious because the next day a fresh supply would be available.

There are other advantages in using radon. An amount of radium is specified in terms of grams (or milligrams) of radium element present in any given preparation. The amount of radon having the same gamma ray activity (actually whose descendants are the same) as 1 Gm. of radium is called 1 curie; the amount corresponding to 1 mg. of radium is 1 millicurie. One millicurie of radon can be compressed into much less space than 1 mg. of radium, so that radon sources can be made much smaller than radium ones of the same strength. Moreover, if the radon is removed each day

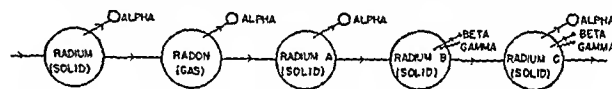


Fig. 1.—A portion of the uranium series of radioactive substances, showing those elements which are important in radiation therapy.

from the radium source it can be put into tubes or containers of various sizes and shapes, so that a variety is always on hand.

As soon as a radon source is separated from its parent radium it begins to deteriorate, as already stated, at the rate of 16.6 per cent daily. The day a source is prepared, its strength is measured by comparing its gamma ray activity with that of a known amount of radium sealed in a permanent tube.² Thereafter its strength can be calculated at any time, since its hourly and daily rate of loss is known. Practical tables have been developed for this purpose. The effective lifetime of a source depends on its initial strength and on the purposes for which it is used.

In practice, the actual separation of radon from radium requires the use of complicated physical apparatus and the services of a trained technician. The appearance of such an apparatus is shown in figure 2. The radium, in the form of a solution of radium chloride, is kept in the safe. Glass tubes connect the flasks containing the solution with the apparatus; a vacuum is maintained in the whole system. At the time of the collection of the radon, by manipulating the vacuum pumps and the mercury in the various flasks the operator forces the radon gas which has accumulated above and in the radium solution into the part of the apparatus marked A, where it is purified. The impurities consist mainly of water vapor, hydrogen and oxygen, all of which have come from the solution. When they have been removed, the radon remaining occupies an extremely small volume. It is then pumped

¹ For a detailed discussion of radioactivity, radioactive series and radioactive constants the reader is referred to standard works on the subject. Among these are

Rutherford, Ernest. *Radioactive Substances and Their Radiations*. Cambridge University Press, 1912.

Rutherford, Ernest, Chadwick, James, and Ellis, C. D. *Radiations from Radioactive Substances*. New York, Macmillan Company, 1930.

Glasser, Otto, editor. *The Science of Radiology*. Springfield, Ill., Charles C. Thon Co., Publisher, 1933.

² A description of such measurements would be out of place in the present report. They are carried out by means of special electrical instruments developed for the purpose, which must be available in any institution where radon sources are prepared.

to the region above the stopcock marked B. At this point the metal or glass containers to be used will have been previously sealed on, and the radon can be forced into them. The filled containers can then be removed, measured and prepared for therapeutic use.

When the radon is enclosed in the usual type of thin glass tube, the rays emitted from the tube consist of about 96.5 per cent beta and 3.5 per cent gamma. If this tube is embedded in tissue, 97 per cent of the total radiation emitted is absorbed in the centimeter of tissue immediately surrounding it. Only 3 per cent of the initial radiation penetrates 1 cm. of tissue; this is mainly gamma radiation.

If the glass tube is enclosed in 0.5 mm. of platinum, all of the beta and some of the gamma rays will be absorbed in this metal; the radiation emitted from the surface of the platinum tube will be only 2.77 per cent of that from the glass tube, but it is all gamma radiation.

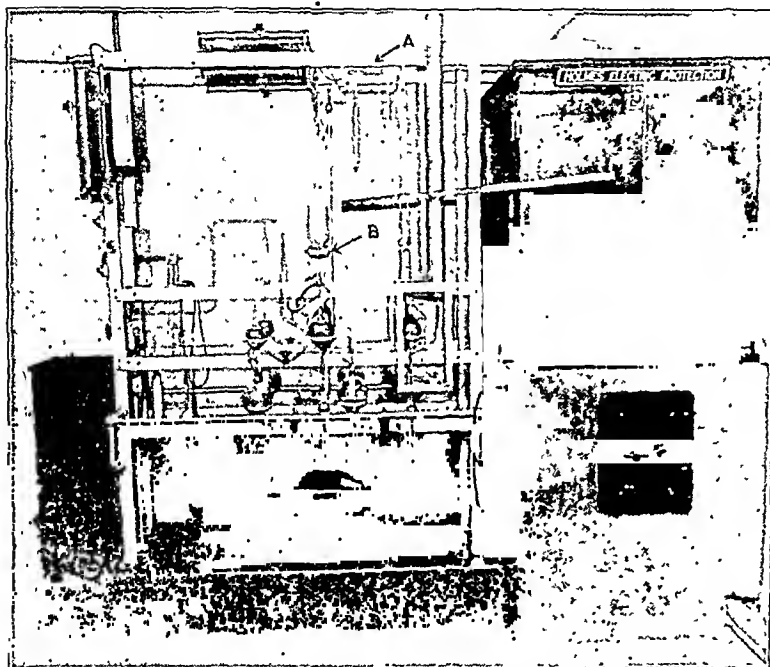


Fig. 2.—Apparatus used at Memorial Hospital for the separation of radon from radium.

Of this, 6 per cent is absorbed in the centimeter of tissue immediately surrounding the tube; 94 per cent penetrates to more distant cells (in contrast to only 3 per cent for the glass tube). Ninety-four per cent of 2.77 is 2.62. In other words, when the half millimeter platinum tube is used, 2.62 per cent of the initial radiation reaches cells at more than a centimeter distance, as compared with 3 per cent for the glass tube alone. But in the latter case (glass) the tissue surrounding the tube has to absorb the other 97 per cent, whereas in the former (platinum) they were absorbed largely in the tube itself.

Evidently with the glass tube, in order to deliver an adequate dose at a distance of a centimeter in tissue, an excessive dose must be administered to the region close about the tube. When the metal is employed it absorbs the oversupply of beta rays, and the nearby tissues do not suffer so greatly. This process of removing undesirable radiation by the use of metal covers for radium (or radon) sources is called filtration. It is a factor deserving of great consideration when radioactive sources are implanted directly into the tissues (interstitial irradiation).

A factor of even greater importance is the distance from the source.³ The intensity of radiation falls off very sharply at a short distance from the tube because of the spreading of the rays, the well known inverse square law. The extreme effectiveness of this law in interstitial irradiation may readily be illustrated. Consider an implant³ so small as to be practically a point source of radiation; the rays are emitted from it in all directions. All of them except those absorbed in the first 5 mm. of tissue pass through the surface of a sphere at this distance (5 mm.) from the source. The area of this sphere is 3.14 sq. cm. ($4\pi r^2$). All the rays which pass through this sphere, except those absorbed in the next 5 mm. of tissue, must also pass through a spherical surface at 1 cm. from the source. The area of this outer sphere is 12.56 sq. cm., which is just four times that of the inner one. The same amount of radiation must hence be spread out over

four times the area, so that any particular cell or group of cells at the larger distance receives only one fourth as much radiation as it would at the smaller.⁴ At 1.5 cm. it would receive only one ninth as much. It is apparent that cells at any great distance from an implant will receive a very much smaller dose of radiation than those close to it.

This decrease in intensity by virtue of the inverse square law is completely independent of the absorption of radiation by the tissue referred to. The statement that 94 per cent of the radiation from a half millimeter platinum tube penetrates to a distance of a centimeter in tissue must not be interpreted as meaning that the intensity at 1 cm. distance is 94 per cent of that at the surface of the implant. This 94 per cent is spread out so that it covers an area many times the area covered by the total radiation at the tube surface, so that the actual intensity (radiation per unit area) at 1 cm. is an extremely small fraction of that at the surface of the tube. It is evident that for filtered radiation the effect of distance on the intensity is much more important than that of absorption in the tissue. These effects of filtration and distance will be

referred to later, in connection with the practical application of radon in interstitial therapy.

The first actual treatment of a tumor by the insertion of radium directly into it appears to have been done by Dr. Robert Abbé in New York in 1905. He made a surgical incision into an exophthalmic goiter, placed the tube in it, and left it for twenty-four hours. Following his report of this case, others used the method for some time. Their applicators were all bulky; little effort had been made to limit their size. Stevenson and Joly took a great step forward when they utilized radon (at that time called radium emanation). This they could introduce into very fine glass tubes, which could in turn be placed in fine hollow steel needles. These were inserted into the mass to be treated and

3. The "source" of radiation is its point of origin; in the case of radium or radon it is the actual radium or radon. It is sometimes customary to refer to the tube containing this material as the source. When this is done, it must be remembered that only the portion of the tube or needle which actually contains radioactive material (the "active portion" or "active length") can thus be considered. An "implant," as considered in this article, is any tube, needle, cell or other container of radium or radon inserted directly into the tissues. The method of inserting the seeds considered in the present report is outlined later.

4. Actually they receive less than one fourth, because of the decrease due to absorption in the intervening tissue.

were removed after a suitable time. The advantages of these needles were so apparent that efforts were immediately directed toward reducing the size of the radium containers, and shortly radium needles were available which were quite small.

Meantime, Duane had suggested that small amounts of radon might be put into tiny glass tubes, and these inserted directly into the tissues by means of a trocar and cannula and left there permanently. Since the radon would disintegrate at the rate of about 16 per cent of the amount present every day, at the end of a month less than 1 per cent of the initial amount would remain. The glass tubes would be sterile and harmless and need no further attention. This idea appealed to Janeway, who wished to test it at the Memorial Hospital. Failla accordingly developed a method for making the glass capillaries very fine and small. Janeway called these tiny implants "bare tubes" and used them successfully over a period of several years.

The method had many advantages over the use of the clumsier removable implants, but it had one great disadvantage. An intense necrosis developed around each implant. This was sometimes responsible for great pain and for the breakdown and slough of the tissues. The foregoing discussion of filtration makes it evident that this was mainly due to the effect of the beta rays and that if they could be removed the situation should be improved.

As a matter of fact, Regaud and his associates, using small platinum needles thick enough to remove the beta rays, and with small radium content, so that prolonged irradiation was necessary, were obtaining good final results with little or no necrosis. It was apparent that, if a filter could be used with the permanent implants, much of the difficulty due to the necrosis could be eliminated.

Various schemes were tried to accomplish this purpose. Heublein attempted to surround each tube, as it was implanted, with a suitable thickness of bismuth paste, using the same needle for the radon and the paste. Preliminary results were unsatisfactory because the distribution of the paste was irregular. The work was abandoned because of the development of more satisfactory methods.

Failla had tried making bare tubes of lead glass, which would absorb more of the beta rays than ordinary glass. However, the thickness of the material required to remove most of the beta rays was so great as to make the tubes unsatisfactory for interstitial use. He accordingly turned his attention to the problem of a metallic tube. The metal should be one with a very high absorbing power, so that the tube walls could be thin. Practically this limited the choice to platinum, gold and iridium. Of these, gold is the least expensive and it has an additional advantage which actually makes its use practical. Pure gold is quite soft, so that if a tube of fine bore is pinched together with a blunt pair of pliers a gas-tight seal will be formed. The problem of sealing gold tubing to the glass radon collecting apparatus had to be solved, but a simple means for doing this was developed.

Implants of this type should be as small as possible. As already stated, a wall thickness of 0.5 mm. of gold is required to remove all the beta rays. To use this would result in an implant having about three times the diameter of the glass seeds. It was felt that a compromise would be desirable whereby the diameter could be kept smaller but a favorable percentage of the beta rays removed. A filter of 0.2 mm. of gold transmits 3.72 per cent of the bare tube radiation; of this about

a fourth is beta radiation. One of 0.3 mm. gold transmits 3.16 per cent of the original; of this less than one tenth is beta. As stated previously, one of 0.5 mm. gold transmits 2.77 per cent of the original radiation, all gamma. After traversing 1 cm. of tissue, in this last beam there will be 2.62 per cent of the original radiation; in those filtered by 0.2 and 0.3 mm. of gold there will remain 2.80 and 2.73 per cent respectively. This means that, in the case of the radiation filtered by 0.2 mm. of gold, 25 per cent has been absorbed in the first centimeter of tissue, of that filtered by 0.3 mm. 14 per cent, and of that filtered by 0.5 mm. 6 per cent. These data are presented in table 1. From the point of view of these figures, the 0.3 mm. gold filter seemed a reasonable and satisfactory compromise. However, various physical, chemical and biologic experiments were performed with gold tubes having walls of 0.2 and 0.3 mm. in order to ascertain which gave the better combination of small size and reasonable filtration.

The first pure gold tubing used had a bore of 0.2 mm., but this was found to be larger than necessary. A bore of 0.1 mm. was practical, but in general a bore of 0.15 mm. seems most satisfactory. Hence tubes of 0.3 mm. wall and 0.15 mm. bore, making a total outside diameter of 0.75 mm., were finally adopted.

TABLE 1.—Data Regarding Gold Filters

Mm. Gold Filter	Percentage of Total Radiation	Percentage Beta	Percentage Gamma	Percentage of Total Radiation Passing Through 1 Cm.	Percentage of Total Radiation Absorbed in First Centimeter
0	100	96.5	3.5	3.14	97
0.2	3.72	22.5	77.5	2.80	25
0.3	3.16	8.8	91.2	2.73	14
0.5	2.77	0	100	2.62	6

A detailed discussion of the extensive experimental work would be out of place here; the interested reader is referred to Failla's original paper.⁵

The "gold seeds" as actually used are about 4 mm. long and contain from 0.5 to 3.0 millicuries of radon. They can be sterilized by boiling. In no case has any significant leakage of radon been detected after boiling for one hour. The possibility of a seal's opening under pressure from the needle as the seed was inserted was tested by injecting a number of them into pieces of tough meat and later recovering them. During this process they were deliberately handled much more roughly than they would be in therapeutic practice. When they were remeasured after recovery, and subsequently, no evidence of a seal's opening was obtained in any case.

It seemed possible that the chisel-like ends of the seeds might be objectionable. Various schemes have been tried for rounding the ends, not one of which has proved entirely satisfactory. Meantime, repeated roentgenograms of some patients, made over periods of years, have demonstrated that the seeds remain in place. At the Memorial Hospital, where the method has been used for more than twelve years, there has been no complaint of trauma from these edges.

The question of the disposition of the implants, permanent or removable, seeds or needles, in the tissues is extremely important. The variations in intensity of radiation due to the inverse square law have already

5. Failla, Gioacchino: The Development of Filtered Radon Implants, *Am. J. Roentgenol.* 16: 507-525 (Dec.) 1926.

been explained. Because of these variations, the distribution of radiation throughout an implanted mass of tissue must evidently be very uneven. It seems advisable to present some numerical data on this point. In table 2 are shown intensities of radiation at different distances from a point source in percentages of the intensity at a distance of 2 mm. from it. In table 3 are shown the variations in intensity at a point half way between two implants as the distance between

TABLE 2.—Effect of Distance on Intensity of Radiation

Distance from Point Source, Mm.	Percentage of Intensity of Radiation*	Distance from Point Source, Mm.	Percentage of Intensity of Radiation*
2	100	8	6
3	44	10	4
4	25	12	3
5	16	15	2
6	11	20	1

* Neglecting absorption in tissue.

them is increased. In both of these tables the absorption of the radiation in tissue is neglected; it would act to make all the values somewhat less. Gold seeds are so small that point source data apply fairly closely. For longer implants, the inverse square law is not strictly applicable; the variations with distance are not so great, although still large. Data for making the proper allowances for the effect of length are available in the literature.⁶

From the data of tables 2 and 3 it is evident that, if the implants are too widely spread, either regions between them will be underirradiated or regions close around them will be overtreated. At best, the distribution of radiation is bound to be uneven. It must be considered that the reaction of cells which receive the least dose is the most important. If these react satisfactorily, others receiving greater doses should also. Hence, in planning treatment of a tumor, the amount of radiation required to deliver at least a certain minimum dose throughout should be ascertained. In order to implant a lesion properly, its dimensions must be known as accurately as possible and an adequate num-

TABLE 3.—Effect of Spacing of Implants on Dosage in Intervening Tissue

Distance Between Implants, Mm.	Radiation Half-way Between*	Distance Between Implants, Mm.	Radiation Half-way Between*
4	200	12	22
6	88	16	12
8	50	20	8
10	32	25	6

* Assuming 100 per cent as the amount delivered at 2 mm. from a single point source, as in table 2.

ber of seeds or needles prepared so that the desired minimum dose can be delivered as uniformly as possible. Certain rules must be followed in placing the radioactive sources within the lesion.

A great deal of work has been done on proper methods of delivering desired doses in interstitial therapy (implantation of radon). It is not felt that data of this kind should be incorporated in a report such as the present one. The reader who wishes such information is referred to the original papers.⁶ How-

ever, it cannot be too strongly emphasized that a knowledge of the size of the mass and the amount of radon (or radium) required is only the beginning of adequate treatment. Proper training in the technic of implantation is essential, as well as experience in the method. Most important of all is sound clinical judgment in determining the method of choice in any given instance.

These points may be illustrated by the diagram of figure 3. In both parts the heavy black line represents the outlines of a lesion 2 cm. in diameter; it has been ascertained that it can be correctly treated with four seeds placed 1 cm. apart as shown in the left hand figure. (The entire diagram is drawn to the same scale.) A margin of safety all around the lesion receives adequate dosage. In the right hand figure, three of the seeds have been displaced, each by less than 0.25 cm. Now a part of the actual lesion is outside the 100 per cent zone, and the margin of safety is meaningless. It is obvious that neither the size of the mass nor the positions of the implants can be determined with any such degree of accuracy as is supposed in the first diagram. Accordingly, it is necessary for the clinician to decide how much leeway he must leave in deciding his dose, and how much irregularity he may permit himself in implanting his sources, and then to be sure that he does not overstep the limits he has set.

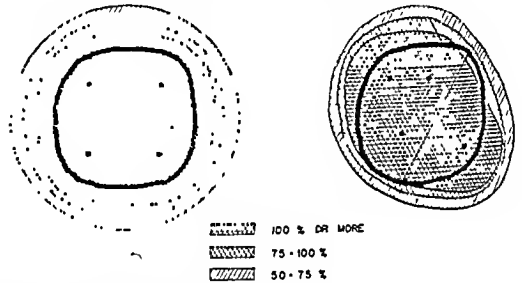


Fig. 3.—Diagram to illustrate the importance of accurate placing of sources in interstitial radiation therapy.

REPORT OF INVESTIGATION ON LEAKAGE

For many years, as far as supervision by any of the councils of the American Medical Association is concerned, all matters pertaining to and all advertising of radium and preparations of radium in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION came within the purview of the Council on Pharmacy and Chemistry. The Council on Physical Therapy had not then been organized. It was during this period that therapeutic radiologists became aware that the use, by implantation into tumors or tissues, of sealed segments of capillary glass tubing containing varying amounts of radon had the serious disadvantage of causing a zone of tissue in the immediate vicinity of these glass-radon implants to undergo necrosis and, as a consequence, of inducing more or less severe pain in any region treated by this method. The necrosis and the resulting pain were due to the insufficient filtration, which allowed all the gamma rays and a considerable proportion of the beta rays as well to escape from the glass containers. As the beta rays are readily absorbed, they exerted their effect indiscriminately on all the cells surrounding the glass seeds to a depth of several millimeters and thus accounted for the necrosis and the pain. In order to obviate this difficulty it was essential to filter the radon sufficiently to eliminate all the beta rays and perhaps also the least penetrating fraction of the gamma

⁶ Quimby, Edith H., and Martin, H. E.: A Basis for Dosage Determination in Interstitial Irradiation, *Am. J. Roentgenol.*, **21**: 240-249 (March) 1929. Quimby, Edith H.: Physical Factors in Interstitial Radium Therapy, *ibid.* **33**: 306 (March) 1935. Paterson, Ralston, and Parker, H. M.: A Dosage System for Interstitial Radium Therapy, *Brit. J. Radiol.*, **11**: 252-266 (April), and 313-340 (May) 1938.

⁷ Because of their small size, these sealed segments of capillary tubing containing radon had long been generally known as "radon seeds."

rays. Experiments carried out by Lacassagne⁸ in 1921 showed that, when plain glass seeds containing radon were embedded in a mass of tissue, the effect was to cause all the tissues surrounding each seed to undergo necrosis for a distance of from 1 to 8 mm. from the seeds. Moreover, for seeds containing from 0.7 to 26 millicuries or more of radon the final diameter of this zone of necrosis was proportional to the amount (or strength) of radon in each seed. When, instead of glass, the seeds were made of segments of fine platinum tubing with a wall 0.15, 0.30, 0.40 or 1 mm. thick and contained the same quantity (or strength) of radon, the thickness of the resulting zone of necrosis diminished as the thickness (and therefore the filtering value) of the platinum increased. Thus platinum seeds with a wall thickness of 1 mm. and containing 10 millicuries of radon did not cause necrosis, while with similar seeds containing 20 millicuries of radon the resulting zone of necrosis was 2 mm. thick, and with seeds containing 34 millicuries of radon the zone of necrosis was 5 mm. thick. The results subsequently obtained by Cutler⁹ and by Quimby and Stewart¹⁰ corroborated those of Lacassagne on the whole, although they showed slight variations in detail which related mainly to reparative changes occurring later in the zone of tissue affected by irradiation under the conditions of the experiments. According to these workers the diameter of the necrotic zone produced by radon seeds embedded in tissue is not proportional to the quantity of radon in the seeds.

The idea of making radon seeds of metal such as platinum in order to filter out the beta rays and some of the gamma rays had occurred to Regaud at least as early as May 1919, because at that time he applied for and obtained from the French government a patent to cover and protect a method of making radon seeds by pinching off and clipping short segments of fine platinum capillary tubing into which a certain quantity of radon had been pumped. With two exceptions, this is essentially the method which has been employed almost universally ever since. One exception refers to a method devised and patented by an American company, whereby sealed glass seeds are inserted into a small capsule of platinum with smoothly rounded ends. The advantages claimed for this method of preparing metal seeds are that the possibility of leakage is obviated and that the smooth ends of the seeds avoid possible mechanical irritation to tissues which, theoretically at least, might be caused by seeds with ends of metal. The other exception is that, in this and certain other countries, gold tubing has generally been used instead of platinum tubing.

At about this time and as a result of competition between two commercial concerns in this field, a considerable advertising controversy arose and was waged for some time. The company which had devised and patented a method of preparing radon seeds by first sealing the radon in segments of capillary glass tubing which were then placed in small platinum capsules with smoothly rounded ends naturally made the most of the theoretical rather than practical advantages of this method. The implications were that (1) radon seeds prepared by pinching off and clipping segments of metal tubing could never be free from the possibility of leakage and that their use, therefore, must be fraught

with uncertainty as to dosage unless repeated physical measurements of their radon content should be made, and that (2) the pinching off method must necessarily result in ragged ends, which must irritate tissues into which seeds thus prepared should be implanted, whereas the smoothly rounded ends of radon seeds prepared by the patented method employed by this company could not possibly irritate the tissues. The first argument will not be considered now but will be dealt with later. As for the second contention, that the "pinching off"

TABLE 4—Results of Measurements of "Pinched Off" Gold Seeds from One Company

Number of Seeds	Claimed Value	Measured Value	Percentage of Claimed Value
3	3.0	2.96	98.7
5	5.10	4.96	97.3
5	5.0	4.87	97.4
5	5.10	4.97	97.5
5	5.30	5.25	99.1
3	3.00	2.94	98.2
4	4.0	3.73	93.2 Leaked
4	6.0	5.89	98.2 Leaked
3	4.5	4.58	101.7
5	10.4	10.00	97.0
5	10.0	9.64	96.4 Leaked
5	10.2	10.02	98.2
5	10.10	10.06	99.6
5	10.30	9.61	93.3
3	9.15	9.28	101.4
Platinum Seeds from Another Company			
3	3.12	2.43	78.0
5	5.25	4.45	84.8
5	6.83	6.07	88.6
5	5.95	4.79	78.8
6	5.10	4.41	86.5
3	3.03	3.13	103.0
4	4.48	3.47	77.7
4	6.38	4.87	76.4
3	4.50	4.34	96.4
5	10.5	9.97	95.0
5	10.12	10.36	102.0
5	10.45	10.17	97.3
5	10.33	8.21	79.2
5	10.10	12.37	122.3
3	9.0	9.48	105.3

* Of the total number of seeds from one company, the following show leakage as indicated:

	Leakage in Percentage of Total Content	
	Before Boiling	After Boiling
Lots of 4 seeds of 1 mc. each	0.01	0.02
	0.02	1.0 approx.
	0.01	0.02
	1.0 + approx.	6.0 approx.
Lots of 4 seeds of 1.5 mc. each	0.014	0.009
	0.016	0.010
	0.023	0.012
	0.016	0.009
Lots of 5 seeds of 2.0 mc. each	0.017	0.018
	0.035	0.032
	0.036	0.035
	0.021	0.30

There was no marked leakage from the seeds from the other company

method leaves jagged ends which must irritate the tissues, this can be easily shown to be at least an exaggeration which could mislead only persons who are not familiar with the details and methods of radium therapy.

When radon, either in bare glass "seeds" or in metal "seeds," is embedded in the living tissues of a patient, the first step usually is to inject a local anesthetic if the lesion to be treated is small, or to put the patient under the influence of a general anesthetic if the lesion is large. Then, after the physical pattern according to which the units of radon ("seeds") are to be distributed and arranged within and around the lesion has been decided on, a number of small slit incisions are made in the skin or, such incisions being dispensed with, a

8 Lacassagne, Antoine. Recherches experimentales sur l'action des rayonnements B et du radium agissant dans les tissus par radiopuncture. J. de radiol. et d'electrol. 5: 160-173 (April) 1921.

9 Cutler, Max. Comparison of the Effects of Unfiltered and Filtered Radon Tubes Buried in Rabbit Muscle. Am. J. Roentgenol. 16: 535-543 (Dec.) 1926.

10 Quimby, Edith H., and Stewart, F. W. Comparison of Various Sources of Interstitial Radiation. Radiology 17: 449-470 (Sept.) 1931.

long hollow needle of large bore, similar to a lumbar puncture needle, or a fine trocar, is inserted into one of the planes of the lesion. A glass or metal seed containing a certain quantity of radon is then placed in the outer end of the lumen of the needle and is allowed to slide down the lumen until it reaches the far end of the needle lying within the lesion. Then a fine metal rod with a diameter corresponding to the bore of the needle or trocar is pushed down the lumen until it comes in contact with the seed. The next move is the crucial step as far as mechanical irritation of tissue by the seed is concerned. If from this point the seed were forced out of the needle by pressure on the mandrel, as is sometimes done, this maneuver might give a semblance of justice to the argument that seeds prepared by the "pinching and clipping" method irritate the tissues in which they are embedded. Even then, however, the small size of the seeds could hardly cause sufficient irritation of tissues to be of any consequence. Proper technic, however, does not countenance such a procedure. Sound technic requires that, once the

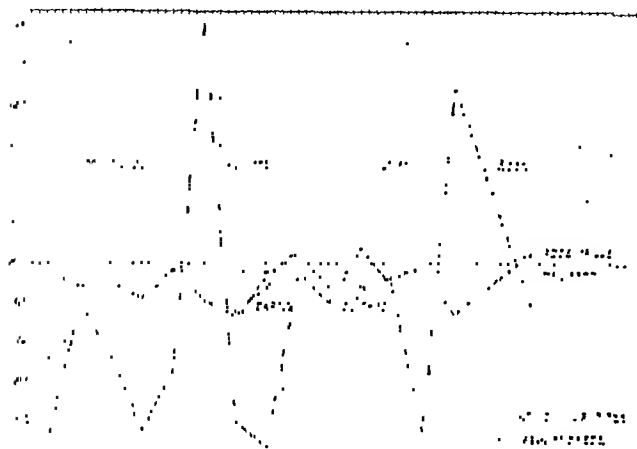


Fig. 4.—Relation of claimed value to measured value.

mandrel comes in contact with the seed, it should not be pushed any farther but should be merely held at this point while the needle is withdrawn with the other hand until it is clear of the opening in the skin, when the mandrel itself is withdrawn. Any irritation produced under these circumstances, therefore, must be produced by the empty needle when first introduced. The only other possible source of tissue irritation comes from the presence within the tissues of the seed acting as a foreign body; this has nothing to do with the smooth or jagged ends of the seed but is solely related to the size of the seed.

In 1934, as far as the American Medical Association is concerned, the control of all matters pertaining to radium and radon was transferred by the Council on Pharmacy and Chemistry to the Council on Physical Therapy. With this control the latter council naturally fell heir to the controversy over the questions of leakage of radon from "seeds" and of tissue irritation arising from any method of preparing the seeds. The Council on Physical Therapy realized at once that, since it was expected by the medical profession to have accurate and reliable information on any subject within the scope of its activities, it was essential that these questions should be thoroughly investigated by those most competent to carry out such investigations. Moreover, the investigators must be specially qualified physicians

who had not had any direct or indirect connection with the controversy already mentioned.

The first step was to select a group of consultants who would cooperate with the Council. After thorough consideration by these consultants, by the Radiation Committee of the Council and by the Council as a whole, the following procedure was finally agreed on with reference to the question of leakage:

The different firms who sell or rent radium or radon to the medical profession were to be asked to select an impartial laboratory and submit to it for investigation and report 100 millicuries of radon to be divided as follows:

Twenty-five per cent, thirty seeds each containing 1 millicurie.

Fifteen per cent, ten seeds each containing 1.5 millicuries.

Fifty per cent, twenty-five seeds each containing 2.0 millicuries.

Ten per cent, three seeds each containing 3.0 millicuries.

The seeds were to be furnished in lots of 10 millicuries at intervals of two weeks. The expenses of this investigation were to be met entirely by the firms. The results of the tests were to be submitted by the laboratory chosen to make the investigation directly to the Council on Physical Therapy, which in turn was to refer the report or reports to the special committee of the Council for review; a copy of the report of results was to be sent to each of the firms whose seeds were being investigated. The report of the laboratory was to include a full description of the testing methods which had been employed. Only one firm submitted this evidence.

Besides the foregoing and in order that the Council might have independent information, the Council purchased on the open market 100 millicuries of radon in the following proportions from two firms:

Twenty-five per cent, thirty seeds each containing 1 millicurie.

Fifteen per cent, ten seeds each containing 1.5 millicuries.

Fifty per cent, fifty seeds each containing 2.0 millicuries.

Ten per cent, three seeds each containing 3.0 millicuries.

These were to be supplied in lots as designated by the investigators. The radon was to be made available as follows:

The committee appointed reputable physicians who were willing to cooperate in this venture and who telegraphed or telephoned to the firms an order in the regular way. When the radon arrived, the physicians noted on the carton the date and time of arrival and sent the radon immediately to the National Bureau of Standards in Washington, for testing. The dates of the placing of the orders was controlled by the bureau, which notified the cooperating physician that it was ready for radon at a certain time, so that there was no lost motion.

After the tests had been completed, the seeds were referred to the other members for investigation. The Council paid for the seeds.

The National Bureau of Standards determined the contents of the radon seeds, whether the proper number of millicuries was present at the time of arrival, and whether or not the seeds leaked before sterilization and after sterilization. The method of making these determinations was left to the bureau.

The Committee, cooperating with the physician who was to place the order, examined the advertising

matter and special directions, if any were sent with the radon. The physicians on the committee offered their services free of charge to the Council. They were reimbursed for incidental expenses.

The report of the National Bureau of Standards follows:

We have completed tests for leakage and for millicurie content of 130 seeds which were purchased by Dr. ——— for this purpose. The purchases were distributed as follows as regards nominal content in millicuries: sixty seeds of 1 millicurie each, fourteen seeds of 1.5 millicuries each, 50 seeds of 2 millicuries each and six seeds of 3 millicuries each.

The procedure adopted for test was to measure each seed with a gamma ray electroscope at the hour named for its use on the certificate furnished by the manufacturer. The seed was then enclosed in a sealed glass container and allowed to stand over night. The air was withdrawn from this container into an emanation electroscope the following morning and a determination of the radon content made. The seed was then boiled twenty minutes, again enclosed in a sealed glass container and the emanation measurements repeated as before.

The results of these measurements are shown in the accompanying tables and graph (table 4 and figure 4) where the values, uncorrected for absorption, obtained for the content in millicuries are shown opposite the claimed value and also the amount of leakage in those cases where leakage occurred. The twelve seeds which showed appreciable leakage were all of the "pinched off" gold type. Even in these cases the amount of leakage was less than 1 per cent of the millicurie content, so that from a practical point of view this leakage could be considered as of no consequence.

More important than leakage is the apparent inability of the firms to fill these seeds to radon content claimed on their certificate with the accuracy which they claim. This is plus or minus 1 per cent for any individual shipment. A column of the tables shows the actual percentage of the claimed radon content which we found by gamma ray measurements. These values are also shown in the accompanying chart. The horizontal line represents 100 per cent of claimed value and the plotted points show the actual percentage found for each shipment. The horizontal dotted lines show the tolerance limit of plus or minus 1 per cent as claimed by the firms. Although values of one firm come fairly near to the tolerance, they often exceed it by a factor of 4 or 5. The values of the other firm are much more widely scattered, sometimes being off by as much as 30 per cent.

We are not informed regarding the effect of such inaccuracies upon the medical use of these preparations, but it is apparent that either these seeds should be filled more accurately or the claims of the companies regarding accuracy of filling should be modified to conform with their ability to hold the amount of radon within given limits.

We would appreciate your comments on this report and will be very glad to explain any points we have not made clear. It is our impression that this concludes this investigation, for the present at least, so we are making no further requests for seeds until we hear from you.

L. J. BRIGGS, Director.

This report of the National Bureau of Standards is so explicit that little comment is necessary. One point, however, might be emphasized. The tests have shown that the question of leakage per se is less important than the accuracy of the physical measurements of radon content made by the companies before the seeds are shipped to physicians. And this irrespective of the method of preparing the seeds. If, as shown by the measurements of the National Bureau of Standards, the measurements of radon content made by the companies supplying radon to physicians are so inaccurate (sometimes as much as 30 per cent), it is idle to quibble about occasional leakage of less than 1 per cent.

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
HOWARD A. CARTER, Secretary.

NATIONAL AIR UNIT NOT ACCEPTABLE

Manufacturer: National Mercantile Company, 80 West Washington Street, Chicago.

The National Air Unit is designed to remove pollen, dust and other solid particles from the incoming air for relief of diseases resulting from the inhalation of such particles. It is enclosed in a metal rectangular box 16 inches wide by 10 inches high by 7½ inches deep with intake projection, and the whole is fitted under the ordinary window sash. There are four sets of fixed louvers on the front of the unit. A shutter may be fitted into the intake to permit recirculation of the room air. Rubber weather stripping is provided. The motor is of the induction type for 110 volts alternating current, consuming approximately 45 watts per hour. A Universal motor is available for direct current. The shipping weight is approximately 25 pounds.

The unit is equipped with a four bladed fan which draws the air through the inlet and through two filters, which are composed of oil-soaked spun glass of approximately 1 inch thickness fixed in a loose wire frame. The filters are set at an angle to the intake, so that approximately 50 per cent of the air passes through each filter. There is a small pan in front of the fan which may be filled with water for humidification.

It is claimed by the manufacturer in data submitted from an engineering firm that the filter will remove 99.47 per cent of pollen, dirt and dust from the air. In order to substantiate these claims the Council appointed a competent physician to investigate the unit. It was installed in an ordinary bedroom window.

Greased slides were hung in front of the filters and also in front of the fixed louvers. One tenth Gm. of ragweed pollen was spread on a sheet of paper and laid under the intake opening. The unit was then started and run for an hour, slides being removed at different intervals and examined for pollen. Large numbers of pollen grains were observed, one count reaching 143 pollen grains in ¼ sq. cm. of area counted on the slide exposed in front of the louvers. Slides exposed on the filter pads themselves showed a much higher count.

The unit was then operated for two weeks during each night until it was fairly well covered with dirt and dust. A new set of slides was then exposed in the same manner as before. No pollen grains were observed, indicating that either the pollen was well adhered to dust particles and the oiled fibers of the filters or had entirely passed through them. A new set of slides was then prepared and placed as described and another 0.1 Gm. of pollen was introduced as on the previous occasion. The slides were removed at varying intervals. Those removed in fifteen minutes averaged 103 pollen grains in ¼ sq. cm. of area counted, the count dropping somewhat at the end of an hour. Apparently the unit is inadequate for the removal of pollen. Large dust particles were observed on all slides exposed, the particles running as high as approximately 50 microns.

The amount of air delivered roughly averaged 150 cubic feet per minute, as measured by the anemometer. The room was exceedingly stuffy and there was an inadequate intake of air to keep the atmosphere comfortable during hot weather. At first the unit was comparatively noiseless but toward the end of the experiment created considerable noise and disturbance in its operation.

Two pieces of advertising matter were submitted with the unit. A pamphlet, "The National Air Unit," makes claims out of proportion to the Council's findings. Objectionable points were observed such as "relieves hay fever and other respiratory diseases." A filter cannot conceivably relieve a respiratory disease. Another misleading statement is "balanced humidity the year around." Although air conditioning equipment might do this, it is not believed that there is a filter unit at the present time that can substantiate this claim.

The second piece of advertising matter, "Plenty of Clean, Fresh Air For Your Health and Comfort," contains many

exaggerated, unwarranted or misleading claims. According to the Council's findings the air volume claim is in excess of the actual amount of air circulated; the efficiency of the filters is nowhere near the value claimed; there is insufficient provision for proper humidification, and the unit becomes noisy after prolonged use.

In view of the foregoing report, the Council on Physical Therapy voted not to accept the National Air Unit for inclusion in its list of accepted devices because the unit is mechanically unsatisfactory and advertising claims made for it are exaggerated, unwarranted or misleading.

Council on Pharmacy and Chemistry

SPECIAL REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING SUMMARY OF REPORTS SENT TO THE JOURNAL BY PHYSICIANS WHO HAVE USED THE DRUG. IT IS NOT TO BE CONSIDERED AS THE STUDIED OPINION OF THE COUNCIL BUT AS A CONSENSUS OF THE INVESTIGATORS' REPORTS.

PAUL NICHOLAS LEECH, Secretary.

SULFAPYRIDINE

During the past year the drug sulfapyridine (2[para-amino-benzene-sulfonamido] pyridine) has been used experimentally and clinically in this country in the treatment of various types of pneumonia. After careful study, the United States Food and Drug Administration granted the right to manufacturers to distribute the drug in interstate commerce under the stipulations of the act dealing with new drugs. In connection with this study the advice of the Council was sought and received by the Food and Drug Administration. During the period when the drug was under consideration, THE JOURNAL and the Council made every effort to obtain essential information concerning its usefulness and, in so doing, has consulted approximately 100 physicians who have replied to inquiry giving the details of their experiences with the drug. The following statements form a summary of opinion based on the replies which these physicians submitted. In the absence of clinical reports giving detailed information on the drug in the treatment of pneumonia, and because of its importance in present day therapy in pneumonia, the Council submits this summary for the consideration of the medical profession, in addition to the Preliminary Report of the Council which was published in the February 11 issue of THE JOURNAL.

Physicians who were consulted employed this drug in the treatment of approximately 1,800 cases of pneumonia in adults and 650 in children. In some of the cases the drug was employed concurrently with serum; some employed it before and others after the administration of serum, and in many cases the drug was employed alone, without the use of serum.

The replies received lead the Council to believe that it is exceedingly important to discuss typing of pneumonia in connection with the use of this drug before giving further consideration to its use in a given case. It is essential wherever possible to type each case of pneumonia before this drug is administered, because it has been reported by a number of investigators that there are cases of pneumonia which do not respond to this drug and have subsequently responded to the specific antisera. This cannot be too strongly urged, for at present the reports deal only with the treatment of one year's series of pneumonia cases. The relative virulence of pneumonia during this particular period cannot be established beyond any question of doubt and therefore it is essential to employ this chemical agent over a period of years before the extent of its usefulness both alone and as compared with specific antiserum can be definitely determined. For these two reasons, typing should be continued wherever possible.

One principal finding of those who have employed this drug during the past year is that it is particularly efficacious in the pneumonia of children. It will be recalled, however, that many clinics are not in the habit of employing specific antisera in

the treatment of most of their cases of pneumonia in children. The reason for this is the relatively low mortality of pneumonia in this age group. Therefore the effect of sulfapyridine on the mortality of pneumonia in this age group is of less significance than the fact that the severity of the illness is lessened and its course shortened by the use of sulfapyridine. Because of these facts it seems unjustifiable to compare the usefulness of sulfapyridine with specific antiserum in the treatment of pneumonia in this age group on the basis of mortality rate; at the same time it is acknowledged that it appears to be a useful therapeutic measure in the treatment of children suffering from pneumonia.

Its use in adults presents a different problem. Some clinics have found that many cases of pneumonia are particularly susceptible to the combined use of specific antiserum and sulfapyridine. Certain investigators enthusiastically prefer sulfapyridine to antiserum in the treatment of pneumonia in adults. Others advocate it more particularly in pneumonias for which there is no available antiserum. Still others find that the comparative effectiveness of sulfapyridine (both alone and combined with specific antiserum) differs in the various types (I, II, III and so on) of pneumococcal pneumonias. There is not, however, at present sufficient evidence on which to base recommendations for the preference of either in the thirty-two types or even in the most common of the types of pneumonia.

Of primary consideration in the clinical evaluation of any new drug is the toxicity which is encountered in its clinical use. A most common and consistent toxic manifestation of sulfapyridine is nausea and vomiting. Strangely enough this is less frequent in children, but occasionally in adults it reaches the point that necessitates discontinuance of the drug. Occasionally toxic manifestations have been encountered suggesting what might be expected, that the toxicity of sulfapyridine is similar to that of sulfanilamide. To the extent that this drug has been used in pneumonia, the incidence of such complications seems to be as low as, if not lower than, with sulfanilamide. Occasional cases of granulocytopenia, hemolytic anemia and various sensitizations with cutaneous manifestations have been encountered. There also seem to be occasional cases of azotemia and very rarely cases in which there is temporary hematuria, which in some cases has been quite severe. Cyanosis has also been encountered and there has been some leukopenia but its relationship to the lessening of the infection has not been clearly demonstrated.

The manner in which this drug acts has not been definitely established. The drug, for the most part, does not produce all of the changes seen at the crisis in pneumonia, whether a normal crisis or one induced by specific antiserum, but produces results more similar to a short course of bronchopneumonia. The temperature falls in several days, as a rule, following administration of sulfapyridine but there is a considerable tendency for lethargy to remain. In fact, there have been occasional cases in which the lethargy has seemed to increase somewhat to the point of mild mental disturbances which are of short duration.

All of these observations lead to the suggestion that, while there is much to be learned about the exact place of sulfapyridine in the treatment of pneumonia, it appears to be a very useful measure in many cases when properly employed. The facts also suggest considerable caution in its use until such time as more evidence is available of its usefulness and safety. Details of and cautions for administering this drug are discussed further in the description (see page 1831 of this issue of THE JOURNAL).

In summary, it may be stated that at present there is every indication that this drug is a useful remedy, and that it remains to be determined just how effective it is and just how well it will compare with antiserum in various epidemics or over a course of years in various types of pneumococcal infections.

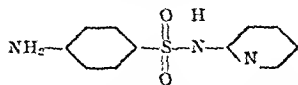
An informal report was presented to the Council at its annual meeting in March of this year and the Council voted at that time to accept sulfapyridine for inclusion in New and Nonofficial Remedies and to proceed with the consideration of the submitted brands of the drug.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

SULFAPYRIDINE.—2-sulfanilamidopyridine. — 2-para-amino-benzene-sulfonamido-pyridine $\text{NH}_2\text{C}_6\text{H}_4\text{SO}_2\text{NHC}_5\text{H}_4\text{N}$.— N^1 -2-sulfanilyl-2-aminopyridine.— N^1 (2-pyridyl) sulfanilamide.



Actions and Uses.—It has been reported that sulfapyridine is an effective chemotherapeutic agent in the treatment of experimental pneumococcal, streptococcal, meningococcal, staphylococcal, Friedländer's bacillary and Welch bacillary infections in mice. Clinically, therapeutic successes have been reported in pneumococcal lobar and bronchial pneumonia, gonococcal, staphylococcal and meningococcal infections. However, the evidence of its effectiveness is convincing only in respect to its use in pneumococcal infections, in which it is apparently about equally effective against all the known types of the pneumococci. Its use in other types of infection must be considered experimental at the present time. In comparison with sulfanilamide, sulfapyridine is irregularly and often poorly absorbed when the drug is given by mouth. The differences in absorption seem to be due to an individual response on the part of the patient. This factor makes rational therapy with the drug more difficult than is the case with sulfanilamide. It also makes it more desirable than ever that the concentrations of sulfapyridine be determined in the blood of patients who are receiving this drug. The drug is, as a rule, conjugated to the acetylated form in the blood and tissues to a higher degree than is sulfanilamide. As the conjugated fraction is inactive from the therapeutic point of view, this again makes therapy at times difficult. As far as is known, the fraction of the drug which is absorbed is excreted mainly by the kidneys in the free and conjugated forms. Excretion is slower than is that of sulfanilamide, and it may be four or five days after the drug has been stopped before it is entirely eliminated from the body.

No patient should be treated with sulfapyridine unless arrangements have been made for daily attention by a physician. This is because of the possibility of serious toxic effects, which, while not frequent, are somewhat unpredictable in their occurrence and presumably have as their basis a peculiar idiosyncrasy. Nausea and vomiting, sometimes very severe, are much more frequent in the course of sulfapyridine therapy than in that of sulfanilamide. Cyanosis, on the other hand, is less marked, as a rule. Acidosis has not been noted, and for this reason it is unnecessary to prescribe sodium bicarbonate when sulfapyridine is being administered. Instances of gross hematuria with and without signs of renal failure have been noted in patients receiving the drug. The mechanism of the production of the hematuria is unknown at the present time. If hematuria occurs, the drug should be stopped. The hematuria may be associated with the formation of acetyl sulfapyridine stones in the pelvis of the kidneys. Drug fever, dermatitis, acute hemolytic anemia, toxic hepatitis and agranulocytosis have been noted in the course of sulfapyridine therapy. The toxic manifestations are very similar to those produced by sulfanilamide and occur at the same periods in the course of therapy as do those produced by sulfanilamide. If toxic conditions arise, plenty of water should be given to wash out the drug.

Dosage.—Adequate standards of dosage have not as yet been agreed on by investigators who have used this drug in the treatment of pneumococcal infections. However, the evidence points to the fact that it is important to establish adequate blood levels of the drug within the first day of treatment. Hence in adults suffering from lobar pneumonia large initial doses are given, such as 4 Gm. in a single dose followed by 1 Gm. of the drug every four hours by mouth, this to be continued until the temperature has been normal for at least forty-eight hours; then the dose may be cut to 1 Gm. every six hours and continued until the resolution of the pneumonic process is well under way. At this point the dose of the drug should be reduced to 0.5 Gm. four times a day and should be continued until the lungs

are clear. It has been noted that, if treatment with the drug is stopped too soon, recurrence of the pneumonic process may occur. Concentrations of 4 mg. per hundred cubic centimeters or more of free sulfapyridine in the blood seem to be necessary for prompt therapeutic responses to the drug.

In children, the initial dose should be from 1 to 2 Gm., depending on the weight of the child, and then from 0.5 to 1 Gm. every four or six hours until the temperature has been normal for forty-eight hours. Following this, the dose of the drug may be gradually reduced until the lungs are clear.

Adequate standards of dosage have not been worked out for the drug in other types of infections.

For determination of sulfapyridine in body fluids a method developed by E. K. Marshall Jr. and A. C. Bratton (to be published in the near future) is to be recommended.

Sulfapyridine occurs as a white, odorless, practically tasteless, crystalline substance. The melting point is 192 ± 1 degree C. (micro melting point apparatus, rate of heating 4 degrees per minute). It is soluble to the extent of approximately 1 per cent in boiling water and about 0.03 per cent at 20 C.; soluble to the extent of about 0.25 per cent in 95 per cent alcohol; soluble in acetone. It forms water-soluble salts with strong bases or mineral acids.

Place approximately 0.01 Gm. of sulfapyridine in a small test tube and heat cautiously over an open flame until the material melts; a brown color develops and an odor of sulfur dioxide is evolved if heating is prolonged (distinction from sulfanilamide, which yields a blue-violet color and the odor of ammonia).

Digest about 1.5 Gm. of sulfapyridine with 75 cc. of boiling water, cool and filter: the saturated aqueous solution of sulfapyridine is neutral to litmus. To 25 cc. of the filtrate add 5 drops of nitric acid and 1 cc. of silver nitrate test solution: the turbidity produced corresponds to not more than 0.01 mg. of chloride. Evaporate another 25 cc. to approximately 10 cc.; add 1 cc. of normal hydrochloric acid and 1 cc. of barium chloride test solution: any turbidity produced corresponds to not more than 0.1 mg. of sulfate ion. Incinerate 1 Gm., accurately weighed, of sulfapyridine; the residue is not more than 0.05 per cent. Add to the residue remaining in the test for ash 0.1 cc. of hydrochloric acid and 0.05 cc. of nitric acid and evaporate on the steam bath. Take up the residue with 0.5 cc. of normal hydrochloric acid and 20 cc. of water; add 10 cc. of hydrogen sulfide water: any darkening produced is not greater than that produced in a control made with 0.01 mg. of lead. Approximately 0.1 Gm. of sulfapyridine shall pass the test for arsenic (U. S. P. XI, p. 436). Dry about 0.1 Gm. of sulfapyridine, accurately weighed, to constant weight at 80 C. under vacuum not exceeding 15 mm. of mercury for approximately five hours: the loss does not exceed 0.5 per cent.

Dissolve approximately 0.2 Gm., accurately weighed, of sulfapyridine, previously dried, in 2 cc. of concentrated hydrochloric acid and 20 cc. of water. Cool and add 15 Gm. of ice. Agitate the solution and titrate with 0.1 molar sodium nitrite solution. Streak the solution on freshly prepared starch iodide paper until an immediate blue streak is obtained. Each cubic centimeter of 0.1 molar sodium nitrite solution corresponds to 0.02493 Gm. of sulfapyridine. The assay is not less than 99.0 per cent nor more than 100.5 per cent. Tablets are assayed by titrating with 0.1 molar sodium nitrite.

SODIUM MORRHUATE (See New and Nonofficial Remedies, 1938, p. 448).

Ampoule Solution Sodium Morrhuate 5% with Benzyl Alcohol 2%, 2 cc.: Each cubic centimeter contains sodium morrhuate 0.05 Gm. (½ grain) and benzyl alcohol 0.02 Gm. (⅓ grain) in aqueous solution.

Prepared by The Upjohn Company, Kalamazoo, Michigan. No U. S. patent or trademark.

Solution Sodium Morrhuate 5% with Benzyl Alcohol 2%, 30 cc. Vials: Each cubic centimeter contains sodium morrhuate 0.05 Gm. (½ grain) and benzyl alcohol 0.02 Gm. (⅓ grain) in aqueous solution.

Prepared by The Upjohn Company, Kalamazoo, Michigan. No U. S. patent or trademark.

Ampoule Solution Sodium Morrhuate 10% with Benzyl Alcohol 2%, 2 cc.: Each cubic centimeter contains sodium morrhuate 0.1 Gm. (1½ grains) and benzyl alcohol 0.02 Gm. (⅓ grain) in aqueous solution.

Prepared by The Upjohn Company, Kalamazoo, Michigan. No U. S. patent or trademark.

Solution Sodium Morrhuate 10% with Benzyl Alcohol 2%, 30 cc. Vials: Each cubic centimeter contains sodium morrhuate 0.1 Gm. (1½ grains) and benzyl alcohol 0.02 Gm. (⅓ grain) in aqueous solution.

Prepared by The Upjohn Company, Kalamazoo, Michigan. No U. S. patent or trademark.

RABIES VACCINE (See New and Nonofficial Remedies, 1938, p. 402).

National Drug Company, Philadelphia.

Rabies Vaccine-Human (Phenol-Killed).—Antirabic vaccine prepared according to the general method of Sir David Semple. The brain and spinal cord of rabbits killed on the sixth or seventh day after inoculation with fixed rabies virus are ground in a ball mill for forty-eight hours with physiological solution of sodium chloride containing 1 per cent phenol. The emulsion is incubated at 37.5 C. for twenty-four hours and finally sufficient physiological solution is added to bring the phenol content to 0.5 per cent. It is kept in the refrigerator for thirty days. Sterility tests are made in fermentation tubes, toxicity tests are made on guinea pigs and safety tests are made on rabbits by intracerebral injections of 0.2 cc. each, the animals being kept under observation for four weeks. Marketed in packages of seven 0.5 cc. ampule-vials (without syringe) and in fourteen 0.5 cc. ampule-vials (with syringe). All doses are of the same potency; one dose is to be given daily over a period of fourteen days.

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SATURDAY, MAY 6, 1939

HUMAN RHEUMATIC VIRUS

The cultivation of a barely visible filtrable pleuro-pneumonia-like virus¹ from human rheumatic exudates and proof of its pathogenicity for laboratory animals has been reported recently by Swift and Brown² of the Rockefeller Institute. The chorio-allantoic membranes of chicken embryos were inoculated with joint exudates. Characteristic pearl-like lesions developed on the egg membranes, "globular structures surrounded with flattened epithelium but containing in their center condensed eosinophil material." As many as twenty-four serial passages of the nodule-producing virus were made. During this process an occasional egg became contaminated with ordinary bacteria. Contaminated egg membranes emulsified in 10 per cent human serum were readily freed from all ordinary bacteria by Berkefeld filtration. The resulting filtrates showed little or no reduction in nodule-producing virus titer.

By the Sabin method of "blind passages"³ in beef-serum-dextrose-broth the investigators eventually succeeded in growing a minute, barely visible, pleomorphic micro-organism from such filtrates and directly from bacteriologically sterile human rheumatic exudates. Typical chorio-allantoic lesions were produced with these presumably pure virus cultures.

Mice inoculated intranasally with virus cultures developed pneumonia. The inciting agent has thus been transmitted serially in mice by using as the second inoculum ground pneumonic mouse lungs suspended in broth. Ordinary bacteria have been absent from these lungs as determined by both microscopic and culture technics. Further it was found that 0.1 cc. of a pure virus culture will cause iritis and diarrhea [sic] if injected into the vitreous humor of rabbit eyes. Mice inoculated intracerebrally, intravenously or intraperitoneally, however, failed to develop characteristic lesions,

even though some of them were obviously sick. The human rheumatic virus, therefore, differs from the mouse arthritis virus recently described by Sabin,⁴ which is infectious if injected either intravenously or intraperitoneally in mice.

Thus far no study of serologic specificity has been reported with the human rheumatic agent. Whether or not the Swift-Brown virus is to be considered as a filtrable phase of the streptococcus, therefore, is still an open question. Cultivation of this virus-like micro-organism from joint fluids, pleural exudates and erythema nodosum nodules, however, suggests a new epidemiologic theory of rheumatic disease.

ARTIFICIAL INSEMINATION AND ILLEGITIMACY

Whether a child begotten from artificial insemination is legitimate or illegitimate according to the law is an important question. If the child is illegitimate and if the husband of its mother fails to adopt it legally, the child does not acquire inheritable rights from the husband. A child is legitimate if its parents are intermarried when it is begotten or born. Statutes generally legitimize also the issue of illicit intercourse if the parents intermarry, even though the intermarriage occurs after birth. The fact that conception is effected not by adultery or fornication but by a method not involving sexual intercourse does not in principle seem to alter the concept of legitimacy. This concept seems to demand that the child be the actual offspring of the husband of the mother of the child.

The presumption of law that a child born during wedlock is legitimate is not absolute and conclusive under all circumstances. Even at early common law the presumption was overcome by proof of the husband's sterility.¹ Today the presumption as to legitimacy is more easily controverted than it was in earlier times. Now it is generally recognized by the courts that a child is illegitimate, though born or begotten during marriage, when it is impossible that its mother's husband could have been its father. Every species of legal evidence tending to this conclusion is admissible on the trial of the issue as to its legitimacy.²

Artificial insemination can be effected from only two sources: from the semen of the husband of the prospective mother and from the semen of some other male. If the semen of the husband is used, the child obviously is as legitimate as if it were the result of normal and usual intercourse between husband and wife. If the semen of some other male is utilized, the resulting child would seem to be illegitimate. The fact that the husband has freely consented to the artificial insemination does not have a bearing on the question of the child's legitimacy. If it did, by similar reasoning

1. Whether the minute filtrable agent causing bovine pleuropneumonia should be classified as a virus or as a midget bacterium is still a controversial question.

2. Swift, Homer F., and Brown, T. M.: *Science* 89: 271 (March 24) 1939.

3. Sabin, A. B.: *Science* 88: 575 (Dec. 16) 1938.

4. Sabin, A. B.: *Science* 89: 228 (March 10) 1939.

1. See cases cited in Annotations to 36 L. R. A. (N. S.) 255 and 1: A. S. R. 261.

2. See cases cited in Annotation to 31 A. L. R. 1119.

it might be urged that the fact that a husband had consented to the commission of adultery by his wife would legitimize the issue resulting from the adulterous connection.

Some advise that all question as to the legitimacy of a child produced from the semen of a male other than the husband of the mother be ignored, apparently relying on the secrecy attendant on artificial insemination and on the presumption of law that a child born during wedlock is legitimate. Such reliance, however, disregards the apparent intent of the husband to confer on the child the rights incident to legitimacy. Those rights, if illegitimacy or even doubt as to legitimacy is frankly recognized, can be assured by adoption proceedings, which ordinarily are comparatively simple.

In many instances of artificial insemination, perhaps in a great majority, the facts may never be known to any one other than husband and wife and the physician involved. There is the possibility, however, that interested relatives may learn of the circumstances and may procure the evidence necessary to overcome the presumption of legitimacy and may thus deprive the child of a share of intestate property. It is the just due of the child that false pride or considerations of delicacy be put aside and that it be given, through adoption proceedings, the protection intended by the husband of the mother when he consents to the artificial insemination of his wife.

SULFAPYRIDINE

In *THE JOURNAL*, February 11, appeared five communications on sulfapyridine. One was a report of the Council on Pharmacy and Chemistry in which the Council recommended that the preparation be not licensed for sale in interstate commerce at that time. Under the new food and drug act we have advanced greatly in the commercial introduction of new products. For the first time a preliminary survey of the potentiality for good and for harm preceded the exploitation of a drug. The medical profession had opportunity of being informed and its representatives consulted about the drug before any preparation was placed on the open market.

After the Council had published its preliminary report, much evidence was assembled. March 2 *THE JOURNAL* sent inquiries to all investigators who had clinical experience with the product during the period between its availability for experimental use and its introduction on the market. Replies were received from about 100 investigators; the summation of their replies appears elsewhere in this issue, in a report of the Council on Pharmacy and Chemistry. The results of these investigations yield two significant observations: first, sulfapyridine is a drug of exceedingly great value in certain cases of pneumonia; second, like sulfanilamide

it is a drug that needs careful supervision. Its use may probably give rise to as many side reactions as sulfanilamide, if not more—for instance, hematuria. (See article and editorial comment on kidney complications in this issue.)

Sulfapyridine was licensed for sale in interstate commerce on or about March 10. The Council and *THE JOURNAL* approve the action taken by the government in releasing the drug at that time. The final survey by the Food and Drug Administration was carefully conducted and warranted the release. At present *THE JOURNAL* is overwhelmed with papers that have been sent in by various investigators. *THE JOURNAL* is grateful for these contributions. Since, however, most of the original articles are merely confirmatory of work already published, it has been necessary for *THE JOURNAL* to accept only a few articles. Manuscripts dealing with unusual side reactions or unusual toxic effects or papers reporting extended studies will of course be given special consideration.

Several physicians and organizations have sent inquiries to the headquarters of the American Medical Association asking for an explanation of the relatively high cost of sulfapyridine—approximately 10 cents for a 5 grain tablet in lots of 1,000. A number of factors probably enter into the situation. The drug is patented and therefore not available to free competition. May & Baker, the English concern, assigned its patent rights to Merck & Company of New York. The Calco Chemical Company, it is also understood, claims that it is entitled to a patent and has filed interference claims. One of the ingredients for making the drug, pyridine, has skyrocketed in price from about 35 cents a gallon to approximately \$1.75 a gallon. Of course the introduction of any new drug entails tremendous expense, because of the high cost of investigation; in addition, much of the drug must be given free to investigators. For this outlay the firms must be repaid. That the drug might be available and not withheld because of legal complications due to the patent situation, the Calco Chemical Company—a member of the American Cyanamid Corporation—and Merck & Company apparently entered into an agreement whereby the Lederle Laboratories of New York—also a member of the American Cyanamid Corporation—would be the outlet for the pharmaceutical and medical distribution of the drug. The Lederle Laboratories, it will be recalled, have contributed greatly to the development of serums for the treatment of pneumonia, thus being concerned simultaneously with biologic and chemotherapeutic agents. Even with the high price of sulfapyridine, the cost of treatment is considerably less than with the use of antipneumococcus serum. No doubt the commercial investments will soon be equalized, and there is reason to hope that the price of sulfapyridine may be materially reduced in the near future.

Current Comment

BOARD OF TRUSTEES MEETS WITH REGENTS OF COLLEGE OF PHYSICIANS

On April 29, pursuant to its established policy, the Board of Trustees and officers of the American Medical Association conferred with the regents of the American College of Physicians concerning problems of mutual interest, particularly graduate education and the preparation of young men for the practice of internal medicine. Similar conferences will be held with other groups to secure mutual understanding and more effective cooperation from various medical organizations in the specialties where there is joint interest and concern, the purpose being to avoid duplication of effort and unnecessary expenditure of funds, and also to develop efficient leadership, unification of action and satisfactory progress. The discussions on graduate education in the field of internal medicine were led, for the regents of the American College of Physicians, by Drs. O. H. Perry Pepper and Hugh Morgan, and, for the American Medical Association, by Drs. Arthur W. Booth, Austin A. Hayden, Charles Benjamin Wright and R. L. Sensenich of the Board of Trustees and Drs. W. D. Cutter and J. H. Musser of the Council on Medical Education and Hospitals. Most of the other members of the conference also participated in the general discussion. It is proposed to hold similar sessions from time to time with the executive bodies of other leading organizations in the field of the medical specialties.

EFFECT OF SULFAPYRIDINE ON THE URINARY TRACT

A new complication associated with the administration of sulfapyridine is described elsewhere in this issue.¹ Three cases of hematuria, abdominal pain and nitrogen retention were associated with the administration of this drug. All three showed hematuria apparently due to the drug, while in two there was severe abdominal pain of renal and ureteral origin. In the two in which the determination was done there was nitrogen retention due to renal insufficiency. None of the patients had shown evidence of urinary tract disease prior to the administration of the drug for pneumonia. In all instances the manifestations cleared promptly when sulfapyridine was stopped and adequate fluids were administered. Confirmatory evidence of an experimental nature is offered by the recently reported study of Antopol and Robinson,² who observed the formation of uroliths in the urinary tract of rats, rabbits and monkeys fed with sulfapyridine. While concretions have been observed after the administration of a single large dose, the results were more striking after a repeated feeding on successive days, although urolith formation varied greatly in the different species and to some extent even in the same species. A few hours

after the oral administration of a large dose of sulfapyridine the urinary tract in susceptible animals contained needle-like crystals of the acetyl derivative of sulfapyridine. The crystals in animals that were killed were observed most frequently at the level of the bony pelvic brim. The microscopic appearance of the kidney varied with the degree of urinary stasis. There is, it is pointed out, a suggestion that the crystalline compound, when not excessive, can either be redissolved or washed out. The uroliths consisting of this acetyl derivative permit penetration of x-rays, but it has been observed that calcium can be deposited about these concretions, in which case the shell may become radiopaque. The serious potentialities of this complication of sulfapyridine therapy necessitate careful observation in each case.

THE SURGEON GENERAL'S REPORT

The annual report for the fiscal year 1938 by Surgeon General Thomas Parran of the Public Health Service¹ summarizes health conditions in 1937. The general health conditions in the United States were favorable for 1937, as indicated by preliminary mortality rates. There is an indicated decrease in the death rate of about 3 per cent in 1937 as compared with 1936, and a decrease of more than 8 per cent in the infant mortality rate. The decline in maternal mortality was continued in 1937 as evidenced by a provisional rate of 4.6 per thousand live births, as compared with 5.3 for 1936. In one respect in particular, however, the United States health record was unenviable. For 1937 forty-eight states reported a total of 11,673 cases of smallpox as compared with 7,834 for 1936 and 7,957 for 1935. The number of cases for 1937 was the highest since 1931, although fortunately the case fatality rate was favorably affected by the generally mild, nonvirulent type of smallpox which obtained. The activities of the Public Health Service remain impressive. Active assistance has been rendered to numerous states and territories. Progress in investigative matters was signalized by the organization of the National Cancer Institute and by the laying of the corner stone of the first building to be erected in the new group of structures for the National Institute of Health near Bethesda, Md. Continued attention has been given to evolving a satisfactory control of biologic products, a work in which the actions of the health service have been invaluable. Investigations have been carried on in industrial hygiene, especially with the object of developing means for the protection and improvement of the health of the workers in various fields of industry, and an extensive study of rheumatic heart disease has also been conducted with noteworthy preliminary statistical, clinical and laboratory investigations already reported. Other important activities of the Public Health Service have been related to poliomyelitis, sanitation, grants-in-aid for cancer research, quarantine and immigration activities, mental hygiene and, of course, venereal disease control. The continued improving picture of the country's health is evidence that health conditions are not as black as they are sometimes painted.

1. Southworth, Hamilton, and Cooke, Crispin: Hematuria, Abdominal Pain and Nitrogen Retention Associated with Sulfapyridine, this issue, p. 1820.

2. Antopol, William, and Robinson, Harry: Urolithiasis and Renal Pathology After Oral Administration of 2(Sulfamylamino) Pyridine (Sulfapyridine), *Proc. Soc. Exper. Biol. & Med.* **40**: 428 (March) 1939.

1. Annual Report of the Surgeon General of the Public Health Service of the United States for the Fiscal Year 1938.

ORGANIZATION SECTION

DISTRIBUTION OF PHYSICIANS IN NEW YORK STATE

A decennial study from 1878 of the distribution of physicians in New York State made by Dr. Joseph S. Lawrence and published in the *New York State Journal of Medicine* (39:199 [Feb. 1] 1939) shows that:

In the entire state the population has increased 167 per cent in the last sixty years, while the number of physicians has increased 477 per cent. In upstate areas the increases have been 86 per cent and 256 per cent respectively. The ratio of physician to population in the entire state is 1:576, while in upstate alone it is 1:720. In Greater New York the ratio is 1:497 and in Manhattan and Brooklyn, where there is the greater concentration of specialists, the ratio is 1:387. The increase in the population of these two boroughs in the last sixty years is 146 per cent, while the physicians increased 581 per cent. While the physicians increased much more rapidly than the population, the increase in some rural counties was much greater; for example, in Orange County, where the population increased but 50 per cent, the physicians increased more than five times that much, 288 per cent; in Rockland the population increased 124 per cent and physicians 693 per cent; in Warren the population increased 40 per cent and physicians 319 per cent.

Dr. Lawrence finds that the common complaint concerning the age and scientific qualifications of the rural physicians is not justified in New York State. According to the report:

Laboratory and hospital facilities are readily available to the rural resident physician, and journals and county medical society postgraduate courses help him keep abreast of the time as well as the urban resident physician.

The conditions and opportunities of the rural and urban physicians being so nearly equal, one might expect the periods of practice to bear a close resemblance, and they do. Approximately 25 per cent of the physicians in both areas have been in practice less than ten years and another 20 to 25 per cent have been in practice less than twenty years. The assumption

that the recent graduate shuns rural practice is only partly correct. Many seek rural locations but, not being successful, are eventually obliged to locate in the cities. But there is another factor operating. Not a few physicians, seeing their most prosperous families forsake the farms for the cities, have followed them advantageously.

The state is well supplied with hospitals, maternity homes and laboratories, the latter being largely under the Division of Laboratories of the State Department of Health.

The report reaches the following conclusions:

Resident physicians and hospitals are distributed throughout the state in such fashion that no area is without medical service. Schuyler County has the lowest ratio of physician to population, 1:1,298, and the highest is in Dutchess County, 1:478. In the relation of general hospital beds to the population, the lowest is found in Livingston County, 1:1,644, and the highest ratio exists in Ontario County, 1:84. In evaluating these figures, it must be borne in mind that no county is an isolated unit, so that the services of physicians and hospitals of neighboring counties are always available.

Improved conditions for transportation and communications in the rural districts have increased the usefulness of the physician many times over what it was just ten years ago.

The same conditions have led the rural resident to seek the services of the city physician except for emergencies. In some instances this trend has induced rural physicians to move to the cities, at the same time retaining their rural practices.

None the less improved living conditions are attracting young men to locate in the rural areas.

There is no marked difference in the ages of the men practicing in the rural districts as compared with those in the urban districts.

Decreases in population must be marked and prolonged before there is any effect on the number of physicians. Areas of growing population have larger proportions of young physicians.

Nursing service as a part of a public health program demands prompt study.

STATE AND CONTRACT MEDICINE

The annual session of the International Medical Association, held at Copenhagen Aug. 25-28, 1938, heard the report of an inquiry with regard to the effect on the medical profession of a physician's holding several offices or receiving fees from several sources in the practice of medicine. The report was published in the *Revue internationale de médecine professionnelle et sociale* 11:59 (Nov.) 1938.

Dr. Zahor of Czechoslovakia discussed the general effect of an increase in salaried physicians employed especially by the state or in sickness insurance organizations. He insisted that the most important factor in the problem was the moral effect on the physician. In discussing this, he said: "The limit of medical activities must be the possibility of maintaining honest and conscientious service. This is all the more important since the services of a physician deal with the things most dear to humanity: the health, whether of the individual as with the great majority of practicing physicians or of collective society as is the case with health officials, employees of sickness insurance institutions and so on. . . . It seems unnecessary to say again that the relations between the physician and his patients should be confidential. But actually this is no longer the case, when treatment takes on a certain 'routine.' We would offer all possible resistance to this tendency. The

patient is not an object on an assembly line. Sickness is not a number on the register, even though financial considerations may make it necessary to give it such a number. Every patient must be seen as an individual: a good physician should individualize his treatment and always feel the full responsibility which the confidence of the patient places on him.

"The physician holds within his hands health or sickness, capacity to work or invalidity, hope and despair, life and death. It is due wholly to the great value of his services that the physician has acquired his social position, his material and economic level, his moral and political position, and above all his success. Every service that is performed superficially, in haste or with negligence is unworthy of a physician and harmful to his profession. Now, excess of work leads to just these things, and that is why the physician should not be permitted to undertake more labor and more functions than those which he can do honestly and conscientiously. . . .

"From another point of view, the interests of the profession demand that the principles of ethics of the medical group should be observed by every physician. This not only is necessary to preserve the prestige of the profession but also is of importance economically. But necessity knows no law, and poverty destroys the character. For those who cannot

obtain even the minimum necessities to exist, there is great danger that forbidden positions will offer forbidden rebates and will betray the professional group, to its great embarrassment. We must admit that there are already visible within the medical corps certain regrettable symptoms which demand the energetic attention of the professional group if we are to prevent a fall in the moral standard. . . .

"First of all, a professional organization has a duty to prevent situations which injure its members. . . . It should

demand that medical employees be obtained exclusively through the medical society. Any institution that has need of the services of a physician should address itself to the medical association to determine the conditions of employment. Each proposal should take into consideration, first, not only the desires and interests of the institutions making the request but also those of the candidates for the position, their economic situation, and their occupations, with a view to avoiding duplications of positions."

OFFICIAL NOTES

RADIO BROADCASTS

The radio broadcasts by the American Medical Association and the National Broadcasting Company, under the title *Your Health*, continue as previously announced each Wednesday over the Blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 o'clock mountain time, 11 a. m. Pacific time).

Starting April 30, daylight saving time takes effect in Chicago. The program will therefore be broadcast at the same hour Chicago daylight saving time, which means one hour earlier central standard time, two hours earlier mountain time and three hours earlier Pacific time. In communities where daylight saving time is in effect there will be no change in the hour of the broadcast.

Owing to network conflicts the Chicago broadcast does not occur at 1 o'clock Wednesday but there is a rebroadcast from a recording over station WENR at 8 o'clock each Monday evening, on and after May 1 (8 o'clock Chicago daylight saving time, 7 o'clock central standard time). The program broadcast each Monday is identical with the network program of the preceding Wednesday.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

- May 10. The Doctor's Workshop.
- May 17. Healthier Babies.
- May 24. No broadcast because of radio conflicts occasioned by visit of British sovereigns to the United States.

THE ST. LOUIS SESSION

Special Radio Programs

The following radio programs have been arranged in connection with the annual session of the American Medical Association in St. Louis.

Dr. Irvin Abell, President of the Association, will broadcast over the Blue network of the National Broadcasting Company, Monday, May 15, from 4:15 to 4:30 p. m. central standard

time. His subject will be "American Medicine Today." Dr. Rock Sleyster, President-Elect, will broadcast over the Columbia Broadcasting System Monday, May 15, from 3:45 to 4 p. m. Dr. Sleyster will be interviewed by Miss Jane Stafford of Science Service.

Dr. W. W. Bauer, Director of the Bureau of Health Education of the American Medical Association, will broadcast over the Blue network of the National Broadcasting Company, Friday, May 19, from 4:15 to 4:30. He will present a summary of the scientific and sociological developments at the meeting.

ADDRESSES BY OFFICIAL STAFF

DR. W. W. BAUER:

- May 9—Logan Howard Preschool Group, Wilmette, Ill.
- May 10—Women's Club, Public Meeting, Racine County Medical Society, Racine, Wis.
- May 29—South Carolina Public Health Association, Myrtle Beach, S. C.

DR. MORRIS FISHBEIN:

- May 8—Arkansas Medical Society, Hot Springs.
- May 18—Rotary Club, St. Louis.
- May 23—Cornell University Medical School, New York.
- May 23—County of Kings and Academy of Medicine, Brooklyn.
- May 24—American Surgical Trade Association, Washington, D. C.
- May 31—Nurses' Graduation, West Suburban Hospital, Chicago.

MR. JACK LAUX:

- May 12—Community Clubs, Joliet, Ill.

DR. PAUL A. TESCHNER:

- May 25—Ryburn Memorial Hospital Commencement, Ottawa, Ill.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 840 has passed the Senate, with amendment, proposing that no law of the United States shall be construed to limit the power and authority of the Secretary of War, without reference to line of duty status, to require and incur obligations for hospitalization and medical treatment of persons in active military service, other than those treated in private hospitals or by civilian physicians while on furloughs or leaves of absence in excess of twenty-four hours. The President has signed H. R. 1776, providing for the assignment of medical officers of the United States Public Health Service for duty on vessels of the Coast and Geodetic Survey. H. R. 2320 has passed the Senate providing domiciliary care, medical and hospital treatment and burial benefits to certain veterans of the Spanish-American War, the Philippine Insurrection and the Boxer Rebellion.

Bills Introduced.—S. 2214, introduced by Senator Davis, Pennsylvania, and H. R. 5979, introduced by Representative Van Zandt, Pennsylvania, propose to amend title X of the Social

Security Act providing for financial assistance to certain blind persons by adding a provision that the Social Security Board shall not disapprove any plan because it provides for financial assistance to blind persons having an annual cash income of not more than \$1,200. S. 2215, introduced by Senator Davis, Pennsylvania, and H. R. 5980, introduced by Representative Van Zandt, Pennsylvania, propose to amend further title X of the Social Security Act by defining the term "needy individual" to mean "blind persons in need as defined in a who are blind" to mean "blind persons in need as defined in a who are blind." S. 2226, introduced by Senator Sheppard, Texas, proposes to extend without charge the benefits of the Public Health Service, including benefits other than those received at hospitals or stations of that service, to the wives and dependent children of officers and employees of the Lighthouse Service. S. 2232, introduced by Senator Sheppard, Texas, proposes to provide hospitalization and domiciliary care in Veterans' Administration facilities to retired enlisted men of the Army, Navy, Marine Corps and Coast Guard, who are war veterans, on parity with other war veterans. S. 2257, introduced by Senator Gurney, South Dakota, proposes to authorize the appropriate

of \$1,000,000 for the construction of a veterans' hospital and diagnostic center in the first congressional district of the state of South Dakota. H. R. 2875, introduced by Representative Smith, Washington, proposes that pensions payable to widows and orphans of deceased veterans of the Spanish-American War, Boxer Rebellion or Philippine Insurrection shall be effective as of the date of death of the veteran if claim is filed within one year thereafter. H. R. 5977, introduced by Representative Lesinski, Michigan, proposes to provide pensions to members of the Regular Army, Navy, Marine Corps and Coast Guard varying with the extent of service-incurred disabilities resulting from injury or disease. H. R. 5978, introduced by Representative Sheppard, California, proposes to give to male nurses who served under contract with the War Department between April 21, 1898, and Feb. 2, 1901, the rights, privileges and benefits, including pensions, provided for female Army nurses under contract during the same period. H. R. 6041, introduced by Representative Hendricks, Florida, proposes to authorize an appropriation of \$1,750,000 for the construction of a United States Veterans' Administration general medical-surgical hospital and domiciliary facility, with a capacity of at least 500 beds, on or as near to the central east coast of Florida as is feasible.

STATE MEDICAL LEGISLATION

Florida

Bills Introduced.—H. 174 proposes to require the State Board of Health to distribute salvarsan, neosalvarsan, arsphenamine, bismarsen, mapharsen, neocarsphenamine and sulpharsphenamine to the physician of any resident suffering from syphilis or kindred disease requiring the use of any of the drugs stated and financially unable to purchase the necessary drug. H. 419 proposes to require a practitioner of osteopathy to renew his license annually on or before January 1 with the osteopathic board and at that time to pay an annual renewal fee of \$5. The bill also proposes to condition the renewal of a license to practice osteopathy on the presentation by the holder thereof of evidence that in the preceding year the licentiate has attended the two day educational program as conducted by the Florida osteopathic association, or its equivalent. H. 577 and S. 272 propose to authorize the State Board of Health to establish a home for the care and treatment of incurable children.

Illinois

Bills Introduced.—S. 332 proposes that corporations not for pecuniary profit organized under the laws of the state shall be liable on their contracts and for their negligence and the negligence of their officers, agents and servants in the course of their authorized duties and their employment. S. 390 proposes to enact a separate physiotherapy practice act and to establish an independent examining committee to examine and license persons to practice physiotherapy. The bill defines physiotherapy

as "the method, art or science of treating the human body for hygienic or remedial purposes by the following methods: massage and manipulations with the hands or with any agency or instrument, and the use of such adjuncts as light, heat, air, water, diet, gymnastics and electricity."

Michigan

Bill Introduced.—H. 559 proposes to require all persons licensed to practice medicine, osteopathy or chiropractic to renew their licenses annually with their respective boards of examiners and at that time to pay annual renewal fees of \$10. The bill proposes to condition renewal also on the presentation of evidence that the practitioner in the preceding year has attended recognized classes or clinics for the purpose of pursuing postgraduate study of subjects pertinent to his system of healing for not less than ten class hours of fifty minutes each.

Pennsylvania

Bills Introduced.—H. 1358 proposes to enact a law, to be cited as the "Pure Food, Drug and Cosmetic Act," to regulate the manufacture, sale, distribution or advertising of foods, drugs, cosmetics and devices. S. 661 proposes to require every physician attending a pregnant woman during the period of gestation or at delivery to take or cause to be taken a sample of her blood within fifteen days after the time of first examination and to submit the sample to an approved laboratory for a standard serologic test for syphilis. This bill was reported favorably and went to second reading in the senate, April 27. S. 662 was reported favorably to the senate, April 25, proposing to condition the issuance of a license to marry on the presentation by each party to the proposed marriage of a physician's certificate that he or she has submitted to an examination to determine the existence or nonexistence of syphilis and that in the opinion of the examining physician the party is not infected with syphilis or if so infected is not in a stage of that disease which is likely to become communicable.

South Carolina

Bill Introduced.—H. 845 proposes to authorize the organization of corporations to operate nonprofit hospital service plans whereby hospital care may be provided by the corporations through hospitals approved by the South Carolina Hospital Association to persons subscribing to the hospital service plans.

Wisconsin

Bill Introduced.—A. 719, to amend the pharmacy practice act, proposes that the act shall not interfere with the dispensing of drugs, medicines or other articles by physicians in an emergency, provided only such drugs shall be kept in stock by a physician as are necessary for emergency use. The present law provides that the act shall not interfere with the dispensing of drugs, medicines or other articles by physicians. This bill, if enacted, would seem to permit a physician to dispense only in an emergency.

WOMAN'S AUXILIARY

California

The auxiliary to the San Diego County Medical Association met at the University Club in San Diego with eighty members in attendance. A three-act comedy by Mrs. Willard Newman entitled "How Do You Like Your Medicine? or Can You Take It?" was presented.

Mrs. Frances Parish described the service given blind persons by the "seeing-eye dog," at a meeting of the auxiliary to the San Francisco County Medical Society January 17.

At the January meeting of the auxiliary to the San Joaquin County Medical Association, Miss Eileen Clark spoke on the "Function and Needs of the Juvenile Court in the Field of Child Guidance."

Mrs. William Renfry Hunt reviewed "Fifty Years a Country Doctor" by William MacCarthy at the January meeting of the auxiliary to the Santa Barbara Medical Society. Members attended a Forum on "Socialized Medicine," held by the American Association of University Women January 18.

At recent meetings of the auxiliary to the Santa Clara Medical Association, Dr. Edward Liston of Palo Alto spoke on "Medical and Hospital Insurance" and Dr. Walter H. Brown, professor of hygiene at Stanford University, on "Public Health, Past and Present."

Indiana

The auxiliary to the Marion County Medical Society held the annual dinner dance with the society January 10 at the Indianapolis Athletic Club with 480 doctors and their wives in attendance.

The auxiliary to the Vigo County Medical Society held a meeting in Terre Haute recently. Mr. Phil Brown gave an illustrated lecture on Williamsburg.

Minnesota

Dr. George A. Earl, president of the Minnesota State Medical Association, addressed the auxiliary to the association at the Women's City Club, St. Paul, February 1 on "The Medical Outlook." Mrs. W. B. Roberts is president.

Dr. J. M. Hayes addressed the auxiliary to the Hennepin County Medical Society February 3 on "Socialized Medicine."

The auxiliary to the Stearns-Benton Counties Medical Society met in St. Cloud February 9. Mrs. R. N. Jones reviewed "The Citadel." The auxiliary has placed *Hygeia* in eleven schools of these counties.

The auxiliary to the Washington County Medical Society met February 14. Mrs. E. Sydney Boleyn led a discussion of government-controlled medicine and Mrs. C. E. Proshek spoke on Czechoslovakia.

Mississippi

Mrs. Sidney Johnston reviewed "The Horse and Buggy Doctor" by Dr. Arthur E. Hertzler recently before the auxiliary to the Issaquena-Sharkey-Warren Counties Medical Society.

The auxiliary to the Fourth District Medical Society was organized by Mrs. John Howell, president of the auxiliary to the Mississippi Medical Association, February 9. Mrs. P. B. Brumby was elected president. Members of this group have already placed several subscriptions to *Hygeia* in the libraries and public schools of the district.

Pennsylvania

The auxiliary to the Allegheny County Medical Society met January 24. Mrs. Joseph P. Dobo spoke on socialized medicine. Judge Gustav L. Schramm of the Juvenile Court of Allegheny County also addressed the meeting.

The auxiliary to the Berks County Medical Society held its third Annual Health Conference in Reading January 21. Dr. Hugh P. Shellabear, president, Berks County Medical Society, awarded the prizes for the essay contest on "Why Is Health Education Necessary?" which was conducted in the county and city high schools. The films "Prevention of Burns to Children," "The Conquest of Diphtheria" and "The Control of Pneumonia" were shown. Mrs. Augustus S. Keck, president of the auxiliary to the American Medical Association, 1937-1938, addressed the meeting. Dr. Harry B. Corrigan spoke on "Communicable Diseases and Their Prevention."

The auxiliary to the Chester County Medical Society met in West Chester January 17. Mrs. Joseph Scattergood Sr. discussed the proposed National Youth Administration project at Darlington Seminary, West Chester, for the care of fifty girls, aged from 17 to 30, from families on relief from the five counties of southeastern Pennsylvania. This project offers an opportunity somewhat similar to that for boys in the CCC camps.

The auxiliary to the Delaware County Medical Society was the guest of the society at its annual meeting January 12. The speaker was Mr. David McCahan, of the University of Pennsylvania, whose subject was "Building and Insuring the Family Financial Program." It was voted to donate ten subscriptions to *Hygeia* to be placed in schools and libraries of Delaware County. Mrs. Arthur Whitney discussed socialized medicine.

INCREASING SICKNESS IN SCOTLAND

The Department of Health for Scotland has recently issued the "Seventh Report on Incapacitating Sickness in the Insured Population of Scotland." This covers the period from July 1, 1936, to June 30, 1937, during which there was an average incapacity per insured due to sickness of 14.92 days per insured person. Part of the increase in the year 1936-1937 is due to an excess of influenza cases, but when this disease is excluded there is an increase from 8.8 days in 1931-1932 to 10.9 days in 1936-1937. Studies of similar bodies of employed workers in the United States over several years and including influenza gives an average of about 9.0 days lost through sickness per worker annually. It cannot be claimed that the absolute number of days is exactly comparable, as the Scottish statistics apparently include a larger percentage of chronic cases than those for the United States. The significant and apparently wholly justifiable basis of comparison would seem to be between the continuously increasing morbidity under insurance and the constant or slowly decreasing days of sickness under private practice.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Society News.—The Los Angeles County Medical Association was addressed April 6 by Drs. Steele F. Stewart Jr. on "Early Diagnosis and Treatment of Congenital Dislocation of the Hip"; Ward M. Rolland, "Supracondylar Fractures of the Elbow," and Harold E. Crowe, "Short Hospitalization of Fractures."—Among others, Dr. John J. Shea, Memphis, Tenn., addressed the Los Angeles Society of Ophthalmology and Otolaryngology April 17 on "Management of Fractures of the Face."—Dr. William D. Sansum, Santa Barbara, discussed "The Problem of the Underweight Patient" before the Hollywood Academy of Medicine April 13.

COLORADO

Personal.—Thomas Russell Garth, Ph.D., since 1930 professor of experimental psychology, University of Denver, died April 20. In 1912 Dr. Garth assisted in the Rockefeller Hookworm Investigation and in 1930-1931 headed the expedition to study color blindness of Indians, and in 1935-1937 the expedition to study the foster Indian child in white homes; he also served with other expeditions to study the psychology of the Indian since 1919.—Dr. William N. Beggs, Denver, was guest of honor at a dinner given by the Colorado medical alumni of Washington University April 8; he graduated in 1886.—Dr. Edward G. Billings, director of the liaison department of psychiatry, Colorado General Hospital, recently received \$30,000 from the Rockefeller Foundation for the continuation of his work, according to the Denver Medical Bulletin.

GEORGIA

Changes in Health Officers.—Dr. Albert G. LeRoy, Atlanta, has been appointed commissioner of health of Toombs County, effective January 1, and Dr. Robert F. Young, Cartersville, of Bartow County. Dr. Garland L. Weidner has been chosen assistant health officer of Atlanta. Dr. Roland A. Brown, Macon, has been appointed assistant city-county health officer of Bibb County, succeeding Dr. Herbert F. Laramore, who has accepted a position on the staff of the U. S. Veterans' Hospital in Los Angeles, it is reported. Dr. Richard C. Shepard, La Fayette, has resigned as health commissioner of Catoosa and Walker counties, effective April 15, to engage in private practice.

District Meetings.—The Fifth District Medical Society held its spring meeting April 13 at the Academy of Medicine in Atlanta. Dr. Edgar Hill Greene, Atlanta, president, Fulton County Medical Society, gave the address of welcome. Drs. A. Benson Cannon, New York, and Grady N. Coker, Canton, president, state medical association, discussed "Comparative Value of Antisyphilitic Drugs" and "Modern Trends in Medical Practice" respectively. A symposium on the clinical aspects of pellagra was presented by Drs. Tom Douglas Spies, Cincinnati, Virgil P. W. Sydenstricker, Augusta, and James McLennan, Birmingham, Ala.—The Tenth District Medical Society was addressed at Athens recently, among others, by Drs. John Weyman Davis, Athens, on "Treatment of Fractures of the Neck of the Femur" and Joseph Righton Robertson, Augusta, "Internal Urethrotomy."—Dr. Leo W. Koster, New York, discussed certain phases of surgery before the Second District Medical Society at Colquitt April 14.

ILLINOIS

Society News.—Dr. Roland M. Klemme, St. Louis, discussed "Neuralgias of the Head and Face: Differential Diagnosis and Treatment" before the Adams County Medical Society, Quincy, April 10. Dr. Franklin E. Walton, St. Louis, discussed "The Surgeon's Approach to Diseases of the Gallbladder" before the society recently.—The Peoria City Medical Society was addressed March 21 by Dr. James H. Hutton, Chicago, on "Diagnosis and Treatment of Neglected Endocrinopathies"; March 7 by Dr. Raymond M. Rice, Indianapolis, "Clinical Use of Female Sex Hormones," and February 21 by Dr. August A. Werner, St. Louis, "Influence of the Endocrines on Growth and Development."—Dr. Charles E. Galloway, Evanston, Ill.,

discussed "Pathology of the Cervix" before the Sangamon County Medical Society, Springfield, April 6.—Drs. Howard A. Rusk and Harold G. Newman, St. Louis, addressed the Marion County Medical Society, Centralia, April 20, on "Diagnosis and Treatment of Undulant Fever."

Chicago

Pneumonia Service.—A twenty-four hour service for the distribution of pneumonia serum and typing of sputum from pneumonia patients has just been established by the Chicago Board of Health. While the twenty-four hour service is available to physicians only at the department's branch laboratory at the Municipal Contagious Disease Hospital, the service will be available at the central laboratory, located in the city hall, room 707, during specified hours. Detailed information may be obtained from the department of health.

INDIANA

New State Program in Psychiatry.—The state department of public welfare recently inaugurated a program to establish part time mental hygiene clinics to serve most of the communities in Indiana. With the approval of the state medical society, five physicians were given membership in the Indiana Council on Mental Hygiene to be a liaison group between the department of public welfare and the profession. In counties where it is proposed to offer services of a mental hygiene clinic team, the program is first submitted to the county medical society and only after an invitation has been extended by the society is a clinic established. Dr. Exie E. Welsch, who has been directing the mental hygiene program of the bureau of maternal and child health of the state board of health, has been transferred to the bureau of mental care of the state department of public welfare. She will assist Dr. George C. Stevens, director, division of medical care, in organizing the clinics. The liaison committee and the committee on mental health of the state association have agreed that there was no need for two distinct mental hygiene programs with similar aims being conducted in the state board and the department of public welfare.

IOWA

Personal.—Dr. Joseph M. Casey, Fort Madison, was guest of honor at a banquet given by the Fort Madison Medical Society recently in recognition of his completion of fifty years in the practice of medicine.—Dr. Henry A. Meyers, Davenport, was presented with a gold wrist watch by the Scott County Medical Society at a meeting January 3 following his resignation as secretary; he had held the position since 1930.

Public Meetings.—Dr. Ludvig Hektoen, Chicago, executive director, National Advisory Cancer Council, addressed a public meeting at the Hoyt Sherman Place, Des Moines, recently. The meeting was sponsored by the Iowa division of the Women's Field Army, Iowa. Dr. Thurman B. Rice, Indianapolis, gave a public lecture March 5 on "Problems of Sex Education."

KANSAS

Society News.—Dr. Axel N. Arneson, St. Louis, discussed "Treatment of Cancer of the Body of the Uterus" before the Shawnee County Medical Society April 10 in Topeka.—Dr. John M. Waugh, Rochester, Minn., addressed the Sedgwick County Medical Society, Wichita, April 4, on "Management of the Acute Abdomen."

Society Observes Fiftieth Anniversary.—The Golden Belt Medical Society observed its fiftieth annual meeting at Junction City April 13; the speakers were Drs. Arthur E. O'Donnell, who reported a case of screw worm in the nose; Thomas G. Orr, Kansas City, Mo., "Treatment of Peritonitis"; Jacob A. Bargen, Rochester, Minn., "Medical and Preoperative Management of Intestinal Obstruction," and John M. Porter, Concordia, "A Kansas Society Fifty Years Old."

Postgraduate Courses.—A series of postgraduate courses is being held throughout the state under the auspices of the state medical society and the state board of health with the assistance of social security funds. A four week course in obstetrics and pediatrics opened March 20, to reach Beloit, Smith Center, Hays, Ellsworth and Abilene. Drs. William F. Mengert and John H. Randall, Iowa City, are giving the instruction in obstetrics, and Drs. Jean V. Cooke, St. Louis, and Julian D. Boyd, Iowa City, the instruction in pediatrics. A similar course was scheduled for Leavenworth, Sabetha,

Clay Center, Wamego and Lawrence, and the instructors were Drs. William J. Dieckmann and Morris Edward Davis, Chicago, in obstetrics and Mandel L. Spivek, Chicago, pediatrics. A course opened March 9 on venereal disease; it was to continue through April 21 with Dr. Joseph V. Van Cleve, Wichita, as the speaker. Dr. Nathan A. Womack, St. Louis, conducted the postgraduate course on cancer control, which began March 20.

KENTUCKY

State Board Sponsors Radio Program.—The Kentucky State Board of Health inaugurated a series of fifteen-minute radio broadcasts over station WHAS, Louisville, in March. The programs are broadcast Saturday afternoons at 4:45 central standard time. The first program reviewed the organization of the Kentucky State Medical Association and the state board of health and the series continues with dramatizations of the present activities of both organizations.

Society News.—Dr. Percival Bailey, Chicago, delivered the annual Alpha Omega Alpha Lecture of the Jefferson County Medical Society April 21 on "Indications for Operation in Cases of Tumor of the Brain." Drs. George A. Hendon and Pat R. Imes, Louisville, addressed the society April 17 on "Multiple Abscesses of the Liver" and "Immediate Treatment of Automobile Injuries" respectively.—George F. Cartland, Ph.D., Kalamazoo, Mich., addressed the Louisville Obstetrical and Gynecological Society April 24 on "Pituitary Ovarian Relationship with Reference to Use of Pregnant Mare Serum in Therapy."—Dr. Morris Edward Davis, Chicago, addressed a joint meeting of the Jefferson County Medical Society and the Louisville Obstetrical and Gynecological Society, March 6, on "Present Day Treatment of Hemorrhage Late in Pregnancy."

LOUISIANA

Southern Hospital News.—The new eight story addition to the Baptist Hospital, New Orleans, adding seventy-four beds to the 200 bed institution, has been completed at a cost of about \$180,000.

Society News.—Dr. Charles J. Bloom, New Orleans, addressed the Iberville Parish Medical Society at Plaquemine March 3 on "Appendicitis in Infancy and Children."—Dr. Jay W. Cummins, Monroe, addressed the Ouachita Parish Medical Society recently on "The Rationale of Blood Transfusion" and Dr. Robert M. Simonton, "The Toxicology of Sulfanilamide."—Among others, Dr. Eugene M. Robards Jr. addressed a recent meeting of the Bi-Parish Medical Society at Jackson on "Involuntional Melancholia and the Depressive Manic State."—It was decided at the recent annual meeting of the Tuberculosis and Public Health Association to hold the sixteenth annual session in Monroe; this will be the first time the meeting has been held out of New Orleans.—The Orleans Parish Medical Society held its joint scientific and first quarterly executive meeting April 10; the speakers were Drs. John H. Musser and Robert A. Wise on "Bacillus Pyocyanus Meningitis, a Report of Six Cases"; Clyde Brooks, "Toxicity of Sulfanilamide and Related Compounds," and Dean H. Echols, "Tic Douloureux."—Dr. Michael E. DeBaKey addressed the East Baton Rouge Parish Medical Society April 12 on "Surgical Amebiasis."

MAINE

Osteopaths Defeated in Maine Legislature.—The Maine legislature has just defeated the legislative document (H. P. 1706) (L. D. 873) which required hospitals receiving public funds to admit osteopathic physicians to practice, to treat and care for their patients and to furnish laboratory service for osteopathic physicians. The committee reported "ought not to pass" 7 to 3. After a long debate, the bill was defeated 72 to 26.

MASSACHUSETTS

Society News.—Dr. Meredith F. Campbell, New York, discussed "Urogenital Diseases of Infants and Children" before the Worcester District Medical Society April 12.

Health Week in Worcester.—The first "Worcester health week" was observed March 4-10 under the auspices of the health education committee of the local Young Men's Christian Association in cooperation with many other organizations. About thirty-eight health talks were scheduled in cooperation with the Worcester District Medical Society and about twenty-four showings of films related to health topics.

MICHIGAN

Society News.—Dr. Samuel M. Feinberg, Chicago, discussed "Mold Allergy" before the Michigan Allergy Society, Ann Arbor, March 16.—Dr. Plinn F. Morse, Detroit, discussed "Causes of Sudden Death" before the Ingham County Medical Society March 21.—Dr. John Warrick Thomas, Cleveland, addressed the Jackson County Medical Society in Jackson April 18 on "Allergy in General Practice."

Changes in State Health Department.—A new branch laboratory of the Michigan Department of Health was recently established in the Pinecrest Sanatorium at Powers. Dr. Filip C. Forsbeck, director of the bureau of epidemiology, resigned to accept a position with the U. S. Public Health Service, effective March 1. Dr. Forsbeck will make a study of dysentery in the Ohio River Valley; his headquarters will be in Cincinnati. Dr. Arthur W. Newitt, Lansing, who has been chief of the division of tuberculosis, has been appointed acting director of the division of epidemiology.

The State of Health.—The general death rate in Michigan in 1938 was 9.9, according to provisional figures published in the state medical journal. There were 50,470 deaths reported as compared with 53,468 in 1937. The birth rate was 18.7; the total number of births was 95,385 as compared with 91,566 in 1937. A new low point was established for infant mortality with a rate of 45.14 deaths per thousand live births. The maternal mortality rate was 3.56 deaths per thousand live births. Deaths caused by automobile accidents dropped to tenth place. This group totaled 1,444 in 1938 as compared to the all time high total of 2,175 in 1937. Deaths from tuberculosis declined from 2,119 in 1937 to 1,865 in 1938.

Neuropsychiatric Institute Dedicated.—The Neuropsychiatric Institute of the University Hospital, Ann Arbor, was opened February 11 with Alexander G. Ruthven, Ph.D., president of the university, presiding. Dr. Rock Sleyster, Wauwatosa, Wis., President-Elect, American Medical Association, gave the dedicatory address. The institute is a five story wing adjoining the hospital on the north with facilities for the care of sixty adult patients and twenty-three children. There are also increased teaching facilities, including an auditorium seating 140 persons on the subbasement floor and classrooms on two other floors. A large portion of the building will be devoted to research, and the neuropathologic laboratory and photographic department, which will also take care of the photography for the main hospital, are both especially well equipped, according to the *University Hospital Bulletin*. By a recent act of the state legislature, the institute will treat only voluntary patients and committed patients will not be admitted. The study and treatment of incipient or threatened mental disease will be emphasized and research will be directed toward the preventive aspects of psychiatry.

NEW MEXICO

State Medical Meeting at Gallup.—The fifty-seventh annual meeting of the New Mexico Medical Society will be held at the El Rancho Hotel, Gallup, May 11-13, under the presidency of Dr. Eugene W. Fiske, Santa Fe. Governor John E. Miles will deliver the address of welcome. Other speakers will include:

- Dr. Robert W. Lamson, Los Angeles, Allergy and Pseudo-Allergy in General Practice.
- Dr. William Philip Corr, Riverside, Calif., The Management of Diabetes.
- Dr. Benjamin H. Orndoff, Chicago, Early Changes in the Endometrium, Diagnosis and Management.
- Dr. Henry J. Goubeaud Jr., Brooklyn, Ruptured Uterus.
- Dr. Jack G. Hutton, Denver, The Diagnosis of Syphilis.
- Dr. Nelson Paul Anderson, Los Angeles, The More Common Skin Diseases.
- Dr. Ralph M. Stuck, Denver, Spinal Injuries with Nerve Damage.
- Dr. Rollin Russell Best, Omaha, The Physiological Biliary Flush as an Aid in the Management of Biliary Tract Disease.
- Dr. George B. Kent, Denver, The Proper Management of Surgical Lesions of the Biliary Tract.
- Dr. E. Payne Palmer, Phoenix, Ariz., Suspicious Cancer Symptoms.
- Dr. Harold L. Thompson, Los Angeles, The Surgical Treatment of Peptic Ulcer.
- Dr. Paul J. Connor, Denver, Objective Signs in the Diagnosis of Endocrinopathies.
- Dr. Howard F. West, Los Angeles, Symptomatology and Etiology of Spontaneous Hypoglycemia.
- Dr. Oscar B. Nugent, Chicago, Eye Conditions of Interest to the General Physician.
- Dr. Francis C. Goodwin, El Paso, Texas, Use of Bone Traction in Scoliosis.
- Dr. Jacob Travis Bennett, El Paso, Common Feeding Difficulties in Pediatric Practice.
- Dr. William H. Daniel, Los Angeles, Proctology for the General Practitioner.

Dr. Charles H. Arnold, Lincoln, Neb., Splanchnic and Brachial Block Anesthesia.

Dr. Romeo J. Lajoie, Los Angeles, Angina Pectoris.

There will be round table luncheons Thursday and Friday. Entertainment will include a buffet dinner, the annual smoker, dinner dance, reception, luncheon and motor trip.

NEW YORK

New Tumor Clinic.—The Samaritan Hospital, Troy, opened a tumor clinic April 6 with Dr. Victor C. Jacobsen, associate professor of medicine, Albany Medical College, as director. Dr. Jacobsen will be consultant in pathology, Dr. William J. Hoffman, New York, consultant in neoplastic diseases, and Robert A. Patterson, Ph.D., Troy, consultant in biophysics. Sessions will be held every Thursday morning.

New York City

Hospital News.—Dr. Charles Rosenheck delivered the annual memorial address to commemorate the life and work of Dr. Henry W. Frauenthal, founder of the Hospital for Joint Diseases, March 7.—Dr. Howard Fox gave a lecture at Beth Israel Hospital recently on experiences of a dermatologist in the tropics.

Stock Exchange Discontinues Medical Department.—The medical department of the New York Stock Exchange was discontinued as an Exchange activity April 1, newspapers reported recently. Dr. Francis H. Glazebrook, medical director since 1931, has retired and Dr. Robert S. Millen, Westbury, N. Y., will take over the quarters and operate a clinic on his own behalf, it was announced.

Society News.—Speakers at a meeting of the New York Roentgen Society April 17 were Drs. Marcy L. Sussman, Simon Dack and Arthur M. Master on "The Roentgen Diagnosis of Myocardial Infarction" and Dr. William Snow, "X-Ray Visualization of Soft Structures of Pregnancy."—A symposium on eugenics and genetics was recently presented at a meeting of the International and Spanish-Speaking Association of Physicians by Maurice A. Bigelow, Sc.D., and Norman E. Hines, Ph.D., Hamilton, N. Y., and Benjamin C. Gruenberg, Ph.D.—A symposium on the prevention and treatment of automobile accidents was presented before the Medical Society of the County of New York recently; the speakers were John J. Seery, first deputy police commissioner, and Carroll E. Mealey, commissioner, bureau of motor vehicles, New York State, and Drs. David J. Kaliski, Conrad Berens and John J. Moorhead.—The New York Surgical Society devoted its meeting April 12 to a symposium on duodenal ulcer; the speakers were Drs. Richard Lewisohn, James William Hinton, Roland L. Maier and John J. Westermann Jr.

Medical Committees for the Fair.—The committees in charge of arranging medical and health exhibits for the New York World's Fair include the following in addition to those published in THE JOURNAL, April 22, p. 1609:

- Dr. Wilson G. Smillie, exhibit on health administration, sponsored by the American Public Health Association.
- Dr. Adolph G. G. De Sanctis, child health, growth and development committee, Mead Johnson & Co.
- Waite A. Cotton, D.D.S., dentistry and oral hygiene committee, Dental Society of the State of New York.
- John Mohler, D.V.M., veterinary safeguards and public health, American Veterinary Medical Association.
- Dr. Harvey B. Matthews, maternal health, Maternity Center Association.
- Dr. Howard W. Haggard, New Haven, Conn., maze of superstition, the Bayer Company.
- Dr. Milton J. Rosenau, Chapel Hill, N. C., milk control, Cherry-Burrell Corporation.
- Dr. Francis M. Rackemann, Boston, allergy, Lederle Laboratories, Inc.
- Charles-Edward A. Winslow, Dr. P.H., New Haven, Conn., health in the home, the John B. Pierce Foundation.
- Leonard Greenburg, Ph.D., industrial sanitation, West Disinfecting Company.
- Dr. Daniel B. Kirby, conservation of sight and education of the blind, New York Institute for Education of the Blind.

Dr. Putnam Appointed Professor of Neurology—Other Changes.—Dr. Tracy J. Putnam, since 1934 professor of neurology, Harvard Medical School, Boston, has been appointed professor of neurology and neurosurgery in Columbia University College of Physicians and Surgeons, effective October 1. He will also serve as director of services of neurology and neurosurgery at the Neurological Institute of the Columbia-Presbyterian Medical Center. Dr. Vernon W. Lippard, director of the Commission for Study of Crippled Children of the City of New York, has been appointed assistant dean of the medical college. According to an announcement, Drs. Charles A. Flood and Lawrence W. Sloan have resigned as assistant

deans to enter private practice. A native of Boston, Dr. Putnam took his medical degree at Harvard in 1915. He was Moseley traveling fellow at the University of Amsterdam, 1924-1925; Arthur Tracy Cabot fellow in charge of laboratory of surgical research at Harvard, 1925-1926; associate in surgery, Peter Bent Brigham Hospital, 1925-1928. Becoming assistant in surgery at Harvard in 1926, he subsequently served in various capacities until 1934, when he was named professor of neurology. He was visiting neurologist to the Boston City Hospital for many years. Dr. Lippard was born in Marlboro, Mass., in 1905 and graduated at Yale University School of Medicine, New Haven, in 1925. He has been associate attending pediatrician at New York Hospital and associate in pediatrics at Cornell University Medical College.

OHIO

Society News.—Dr. Henry L. Bockus, Philadelphia, addressed the Academy of Medicine of Cleveland April 21 on the diagnosis and treatment of jaundice. Dr. Leroy U. Gardner, Saranac Lake, N. Y., discussed silicosis before the academy recently.

Changes in Hospital Superintendents.—Dr. Fred G. Carter, superintendent of Christ Hospital, Cincinnati, has been appointed superintendent of St. Luke's Hospital, Cleveland, to succeed Dr. Charles S. Woods, who has resigned. Dr. Charles T. Way has been named medical director of St. Luke's and Dr. Willard C. Stoner, medical director for many years, is now medical consultant. Dr. Carter went to Cincinnati in 1935 from St. Paul, where he was for ten years superintendent of Ancker Hospital. He has been president of the Minnesota Hospital Association, the American College of Hospital Administrators and the Ohio Hospital Association; he is now president-elect of the American Hospital Association. To succeed Dr. Carter at Christ Hospital in Cincinnati, Dr. Merrill F. Steele, superintendent of Grant Hospital, Columbus, has been selected.

OKLAHOMA

Society News.—Drs. Rufus Q. Goodwin and Wilbur Floyd Keller, Oklahoma City, addressed the Pottawatomie County Medical Society, Shawnee, April 15 on "Clinical and Therapeutic Aspects of Anemia" and "The Pathology of Anemia" respectively.—Drs. Alfred R. Sugg and Ennis M. Gullatt, Ada, addressed the Pittsburg County Medical Society recently on "Perinephritic Pathology" and "Emphysema" respectively.—Drs. Alvin Ray Wiley and Victor K. Allen, Tulsa, addressed the Muskogee County Medical Society recently on "Relation of Endocrines to Neoplasms of the Breast" and "Individual Technic in Anorectal Surgery" respectively.

PENNSYLVANIA

Dr. Wyant Honored.—Dr. John B. F. Wyant, Kittanning, was honored by the school children of the city March 28 in recognition of his completion of fifty years in the practice of medicine and for his interest in school health. He was presented with a radio and a plaque. A floral tribute was presented to the physician by the Armstrong County Medical Society, for which he has been secretary for nearly forty years. Dr. Wyant also served fifteen years as a member of the board of trustees of the state medical society and acted as chairman of the board for several years.

Philadelphia

Dr. Hamill Receives Strittmatter Award.—Dr. Samuel McClintock Hamill was awarded the Dr. I. P. Strittmatter Gold Medal by the Philadelphia County Medical Society April 12. Dr. Hamill, who has practiced in Philadelphia since 1890, has been active in child welfare work for many years. Among other activities he was chairman of section I on medical service of the Hoover White House Conference on Child Health and Protection and during the past four years was chairman of the Pennsylvania Emergency Child Health Committee. He has served as president of the American Academy of Pediatrics, the American Pediatric Society and the Philadelphia Pediatric Society, as chairman of the Section on Diseases of Children of the American Medical Association and was the first chairman of the section on pediatrics of the Medical Society of the State of Pennsylvania. In addition he was president of the American Association for the Study and Prevention of Infant Mortality in 1915 and again under its later name, the American Child Health Association, from 1931 to 1935. From 1901 to

1919 he was professor of diseases of children at the old Philadelphia Polyclinic and College for Graduates in Medicine and for another year at the University of Pennsylvania Postgraduate Department of Medicine.

Pittsburgh

Society News.—Dr. Allen O. Whipple, New York, delivered the Stewart Memorial Lecture of the Pittsburgh Academy of Medicine March 28 on "Diagnosis and Treatment of Pancreatic Lesions."—Dr. Albert D. Kaiser, Rochester, N. Y., addressed the Pittsburgh Pediatric Society April 14 on "Certain Phases of the Tonsil Problem in Children."—Speakers at a meeting of the Allegheny County Medical Society April 18 were Drs. Harry M. Margolis, on "Protrusions of Lumbar Intervertebral Disks as a Cause of Low Back and Sciatic Pain"; Louis H. Landay, "Coronary Heart Disease"; Joseph H. Barach and Lazarus Lewis Pennock, "Diagnostic Value of Occult Hematuria: Based on a Study of 3,000 Urinary Sediments," and Maximilian H. Weinberg, "Recent Advances in Neuropsychiatry."—A symposium on "Spastic Paralysis (Cerebral Birth Paralysis)" was presented before the Pittsburgh Orthopedic Club April 26 by Drs. Paul Titus, Samuel S. Allen Jr., John A. Heberling and Jessie Wright.

SOUTH CAROLINA

State Medical Election.—Dr. William L. Pressly, Due West, was chosen president-elect of the South Carolina Medical Association at the annual meeting in Spartanburg April 13 and Dr. Douglas Jennings, Bennettsville, was installed as president. Dr. Clough H. Blake, Greenwood, was elected vice president and Dr. Edgar A. Hines, Seneca, was reelected secretary for his thirtieth year. The 1940 meeting will be held in Charleston.

TENNESSEE

State Medical Election.—Dr. William O. Baird, Henderson, was elected president of the Tennessee State Medical Association at the annual meeting in Jackson April 14. Vice presidents elected were Drs. Julian G. Price, Dyersburg; Robert B. Gaston, Lebanon, and James E. Carson, Maryville. The 1940 meeting will be in Chattanooga.

Society News.—Dr. Virgil P. W. Sydenstricker, Augusta, Ga., addressed the Southern Interurban Clinicians Club in Nashville recently on "Hemolytic Icterus Following Splenectomy for Thrombocytopenic Purpura"; Dr. Sydenstricker was president of the club during 1938.—Drs. Henry L. Douglass and Robert H. Williams addressed the Nashville Academy of Medicine and Davidson County Medical Society, Nashville, March 28, on "Exstrophy of the Bladder" and "Results of Fever Therapy at Vanderbilt Hospital" respectively.—Drs. Henry G. Rudner and Robert L. Sanders, Memphis, Tenn., addressed the Dyer-Lake-Crockett Counties Medical Society, Dyersburg, March 1 on medical and surgical management, respectively, of common diseases of the colon, and Dr. Edward B. Smythe, Tiptonville, on "Henoch's Purpura."

GENERAL

Society News.—The eighteenth annual convention of the American Physiotherapy Association will be held at the Hotel Cosmopolitan, Denver, June 25-30.—Dr. Irvin Abell, Louisville, Ky., President of the American Medical Association, was chosen president-elect of the Southeastern Surgical Congress at the annual meeting in Atlanta, Ga., in March. Dr. Grady E. Clay, Atlanta, was elected vice president and Dr. Benjamin T. Beasley, Atlanta, reelected secretary. Dr. Robert L. Sanders, Memphis, Tenn., became president for the coming year.

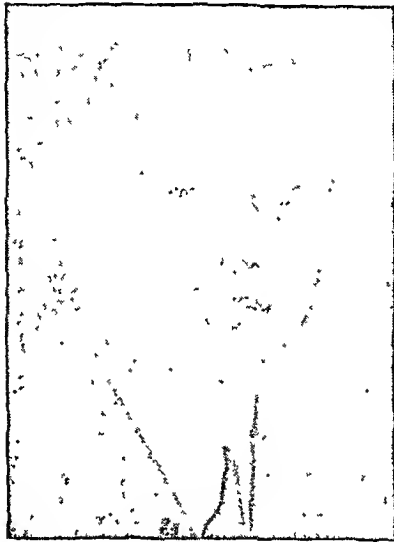
Hospital in India Needs Woman Physician.—The Woman's Hospital at Gauhati, Assam, in northeastern India is in urgent need of a woman physician, according to an announcement. The hospital has forty-five beds and during 1938 cared for 700 inpatients. Those interested should be able to do surgical work. There are two American nurses on the staff, two Indian women physicians, eight Indian staff nurses and twenty-six nurses in the training school. Laboratory and x-ray equipment are available. The hospital is under the Woman's American Baptist Foreign Mission Society. Applications and inquiries may be addressed to the Christian Medical Council, 156 Fifth Avenue, or to Miss Hazel F. Shank, 152 Madison Avenue, New York.

Medal Awarded to Eve Curie.—The Clement Cleyland Medal was presented to Eve Curie, Paris, France, at a dinner given by the New York City Cancer Committee at the Cos-

mopolitan Club April 18. In making the presentation, Dr. Francis Carter Wood, director of the Crocker Institute of Cancer Research, Columbia University, stated "Those in charge of this award, to be given to one who has achieved most during the year in our contest against cancer, are unanimously of the view that it should be given to the author of the 'Life of Madame Curie'—your rare achievement in writing so superb a life of your mother." According to the *New York Times*, this was the first foreign award of the Clement Cleveland Medal for distinguished service to public education on cancer control.

Young Physician Disappears.—Dr. Runyon H. Irvin, Mt. Vernon, Ill., disappeared from his home March 31. A reward is offered by the chief of police of Mt. Vernon and by his

father, Mr. Grant Irvin, telephone 1015, Mt. Vernon, for information as to his whereabouts. Dr. Irvin is 31 years old, 5 feet 11 inches tall, weighs 150 pounds, has a fair complexion, blue eyes, light hair, white teeth with gold fillings. He was wearing a long light gray overcoat, a brown suit, a dark gray hat and black shoes size 11. He is said to be well-mannered and genial and does not use tobacco or intoxicants. He had recently suffered a nervous breakdown. Any message concerning him should be telephoned collect to his parents.



Fellowships Awarded.—Twelve fellowships in the medical sciences, including three renewals, for study in the United States and abroad during the year 1939-1940, were awarded at the February meeting of the medical fellowship board of the National Research Council, Washington, D. C. A list of the successful candidates and institutions where they are to work follows:

Philip P. Cohen (renewal), University of Sheffield, England.
Thomas Harrison Davies (renewal), California Institute of Technology.
Victor M. Emmel, Yale University Medical School.
Dr. Alto E. Feller, Harvard Medical School, Boston.
Arden Howell, Duke University, Durham, N. C.
Fremont Ellis Kelsey, University of Pittsburgh.
Dr. Abe Ravin, Harvard, Boston.
Joseph Shack, Johns Hopkins University School of Medicine, Baltimore.
William M. Wallace, Harvard, Boston.
Wilfried W. Westerfeld (renewal), Eidgenossische Technische Hochschule, Zurich, Switzerland.
Richard Wenzler, University of Stockholm, Sweden.
Dr. William Barry Wood Jr., Harvard.

American Heart Association.—The fifteenth scientific session of the American Heart Association will be held in St. Louis at the Hotel Jefferson May 12-13. The Lewis A. Conner lecture will be delivered by Dr. Harry Goldblatt, Cleveland, on "Experimental Observations on the Pathogenesis and Treatment of Essential Hypertension." Dr. Cecil K. Drinker, Boston, will present the George Brown Memorial Lecture on "Physiological Considerations of the Formation and Movement of Lymph." Other speakers on the program include:

Drs. James Allen Kennedy, Nashville, Tenn., and Charles Sidney Burwell, Boston, Factors in the Circulatory Changes Associated with Pregnancy.
Dr. Henry A. Schroeder, New York, Importance of Restriction of Salt as Compared to Water in Cardiac Failure.
Bradley M. Patten, Ph.D., Ann Arbor, Mich., Microcinematographic and Living Embryos.
Dr. Do im, M.B., and Dr. Charles H. Best, Toronto, Effect of Heparin in the Prevention of Thrombosis Experimentally Produced in Various Blood Vessels.
Dr. Reginald H. Smithwick, Boston, Immediate Effects and Late Results of Sympathetic Denervation of the Upper Extremity by Preganglionic Section.

Alumni Meetings in St. Louis.—The Missouri Medical College, class of 1899, will have a table at the Washington University Medical School Alumni banquet May 17 in the Gold Room of the Hotel Jefferson during the Annual Session of the American Medical Association in St. Louis.—The Phi Delta Epsilon fraternity will hold a dinner dance at the Hotel Chase May 17 at 7:30. Additional information may be obtained

from Dr. Sam D. Soule, 4500 Olive Street, St. Louis.—Alumni of Northwestern University Medical School, Chicago, are holding a dinner in the Hotel Jefferson, St. Louis, May 17, at 6:30 p. m. Dr. George F. Rendelman, St. Louis, class of 1915, is chairman in charge. Dr. John A. Wolfer, Chicago, class of 1908, is president of the medical division of Northwestern University Alumni Association.—A dinner will be held in the main dining room of the Hotel Statler, Ninth Street and Washington Avenue, St. Louis, Wednesday evening May 17 at 7 o'clock by the Jefferson Medical College Alumni, for which all Jefferson alumni are requested to make reservations at convention headquarters. The dinner will be à la carte. Dr. Theodore P. Brookes, 1650 South Grand Boulevard, St. Louis, is chairman of the Alumni and Fraternity Reunion Committee.

FOREIGN

Dr. Loewi in Belgium.—Information has been received that Dr. Otto Loewi, formerly of the University of Graz, Austria, and co-winner of the Nobel Prize in medicine and physiology in 1936, has been released from Germany. He may be addressed in care of Club de la Fondation Universitaire, Rue d'Egmont, Brussels, Belgium. Before being released he was deprived of all his property, both inside and outside of Germany, including his Nobel Prize money, which had never been in Germany or Austria. His wife is still detained in Germany.

International Tuberculosis Conference.—The Eleventh Conference of the International Union Against Tuberculosis will be held in Berlin September 16-20 under the presidency of Prof. Lopo de Carvalho, Lisbon, Portugal. The subjects to be discussed are: "The Problem of the Virulence of the Tubercle Bacillus," "The Value of Systematic Examinations for the Detection of Tuberculosis in Subjects Over 15 Years of Age" and "The Rehabilitation of the Tuberculous." Speakers from the United States include Dr. Kenneth C. Smithburn, New York; Dr. Willard B. Soper, New Haven, Conn., and Dr. Henry Kennon Dunham, Cincinnati. Correspondence should be addressed to the Konferenzleitung der XI Konferenz der Internationalen Vereinigung zur Bekämpfung der Tuberkulose, Berlin W 62, Einemstrasse 11, Germany.

Government Services

Colonel Magee Named Surgeon General of the Army

Col. James Carre Magee, Medical Corps, U. S. Army, has been appointed surgeon general of the U. S. Army with the rank of major general. He succeeds Major General Charles R. Reynolds, whose term as surgeon general expires May 31. Colonel Magee was born in Ireland in 1883. He graduated at Jefferson Medical College, Philadelphia, in 1905. In 1907 he joined the army as contract surgeon, serving for a time in the medical reserve corps of the army. In 1909 he was commissioned first lieutenant in the medical corps of the army, subsequently advancing through the various grades until 1935, when he was commissioned colonel.

Examination for Appointment in Medical Corps

The War Department announces that an examination will be held July 17-21 to qualify candidates for appointment as first lieutenants in the medical corps, regular army, to fill the vacancies occurring during the next fiscal year. Due to the expansion of the air corps and coast defenses with the proportionate increase in officers of the medical corps, it is anticipated there will be considerably more than the usual number of vacancies. The examination is open to all male graduates of acceptable medical schools who have completed one year's internship in an approved hospital and who will not be over 32 years of age at the time it will be possible to tender a commission. It will be conducted by boards of medical officers convened throughout the United States and will consist of a physical examination, a written examination in professional subjects and a determination of the candidate's adaptability for military service. For additional information and application blanks address the Adjutant General, War Department, Washington, D. C. Applications will not be considered after June 30.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 8, 1939.

Limitation of Population Without Contraception

The most striking demographic phenomenon of the countries of western Europe is a fall in the birth rate of about 50 per cent in the last sixty years. In England the usually accepted cause is the use of contraceptives, though others, such as the change in the national diet from whole meal to white bread (producing shortage of vitamins B and E), were suggested at a discussion on the subject held at the Royal Society of Medicine (*THE JOURNAL*, March 19, 1938, p. 908). The use of contraceptives is undoubtedly an important cause, but its numerical importance is not known. In the want of exact knowledge on this point it is of great interest to turn to a neighboring country which shows a similar fall but in which contraception can be practically excluded. Eire is a Roman Catholic country and the people obey the teaching of their church, which condemns contraception. Moreover, the government has made the sale of contraceptives a serious criminal offense. Yet the carefully compiled analysis of the 1936 census, which has just been published, shows a small decline of population. This has not yet occurred in England but is imminent. In the two countries there is a similar decrease in the proportion of the young in the population and increase in the proportion of the old. In Eire, with a population of 3 million, the total decrease since the last census ten years ago is 3,500, but the numbers under the age of 21 years have fallen by 69,000 and under 15 by 47,000. A continuous trend toward an aging population has been in progress since the famine 100 years ago and is partially explained by emigration. The other factor—which indeed is the dominant one of the statistics—is late marriage. Between the ages of 25 and 29 as many as 82 per cent of males are single. This is the highest percentage in Europe and contrasts with 68 per cent in Austria, 47 per cent in England and Wales and 37 per cent in the United States. The percentage of unmarried females and their average age are higher than in most countries. With this handicap it may seem surprising that the decline of population is so small. The explanation is the high degree of fertility of those who do marry, which again is evidence of the absence of contraception. Thus the economic cause, which is limiting population in other western countries, operates, but in a different way.

Regionalization of the Public Health Service

A scheme for regionalization of the public health service has been formulated and in consequence of the international situation is rapidly being brought into force. For this purpose England has been divided into five regions, and a principal regional medical officer has been appointed for each region. He will be assisted by a small team of medical officers selected from the staff of the Ministry of Health. The new arrangement does not involve any substantial alteration in the duties which the medical officers of the department perform at present or in their relations with local authorities, but it is believed that the existence of regional staffs, who will be more familiar with local circumstances and problems than officers stationed permanently at headquarters, will be of great assistance. It is hoped also that local authorities and their officers will find it convenient to be able to refer to principal medical officers in their own regions questions of a medical or quasimedical nature. But there is a still more important reason. The regional scheme is an essential element in the preparations which the ministry is making to provide medical services for a possible national emergency. Its advantages are obvious if

an air attack on London should produce any dislocation of the central control. The scheme does not involve any major change in the work of the senior medical officers at the ministry, who are responsible for special services, such as maternity and child welfare and tuberculosis, though it is hoped that they will be relieved of some routine work. In addition to their general duties they will be available for consultation with the regional staffs and, as in the past, with local authorities. The regional staffs have also been selected to make possible some specialization among their personnel. Some time must elapse before the scheme can be brought into full operation, but the urgency is such that it has been brought into force on a provisional basis.

A Zoological Index

The Zoological Society of London announces the approaching completion of the *Nomenclator Zoologicus* under the editorship of Dr. Sheffield Neave. This great work will be an index of the generic names of all animals. The foundation of modern nomenclature is the tenth edition of the *Systema Naturae* of Linnaeus, published in 1758. The *Nomenclator Zoologicus* is an attempt to bring into a single alphabetical arrangement all the names of genera and subgenera published during and since the time of Linnaeus down to 1935. The information contained in the new *Nomenclator* could be found previously only by searching a large number of publications of which the far more expensive and most ambitious is the *Nomenclator Animalium Generum et Subgenerum* in course of issue by the Prussian Academy of Science since 1926 and still incomplete, with references only up to 1921. The enormous number of animals which have been and are still being described by science is not generally realized. The new *Nomenclator* will contain 225,000 generic and subgeneric names, some 5,000 of which are not to be found in any similar work. It is said that some 10,000 new species and 2,000 new genera of insects are described each year. Of the total in the *Nomenclator* more than half the genera are insects, the mollusks account for 30,000, the arachnids, crustaceans and birds for 10,000 each and the worms for 8,000. The price of the *Nomenclator* is \$31 to subscribers and \$42 after publication. It has been made as low as possible and bears little relation to the cost of production.

Chemotherapy Combined with Immunotherapy

Little work has been done on the relative merits of chemotherapy and immunotherapy or on the value of combining them. At the Royal Society of Medicine Prof. Alexander Fleming of the inoculation department of St. Mary's Hospital made a communication on the synergic action of vaccine and serum therapy and on treatment with sulfanilamide and sulapyridine. He said that it had been shown that the new chemotherapeutic agents had a bacteriostatic rather than a bactericidal action. Their chief result was interference with the growth of organisms, the destruction of which was completed by the natural defensive mechanism of the body. Even in the case of the organism most sensitive—the hemolytic streptococcus—the drug alone did not suffice to destroy it. Immunity could be increased passively by serum therapy or actively by vaccines. The results of combined serum and sulapyridine were not yet available, but he had carried out experiments in vitro which showed the value of the combination. Antipneumococcal serum was found greatly to increase the antibacterial effect of a blood-sulapyridine mixture on pneumococci. Several workers had shown that antiserums in conjunction with sulfanilamide had a striking action. The administration of vaccines with the new chemotherapeutic agents had given results far superior to either alone. Fleming described experiments on the mouse and rabbit in which these animals were injected with pneumococcus vaccine and six days later with pneumococci. Vaccine therapy alone, like chemotherapy alone, pro-

duced a diminution in the number of colonies, but only the two combined produced total destruction. There was clinical evidence pointing in this direction, though it was not conclusive. His conclusion was that the new drugs acted on certain sensitive bacteria, retarding or preventing their reproduction, and that then the natural defensive mechanism completed the destruction. The result depended on the sensitiveness of the infecting organisms to the drug and also on the immunity of the patient. This immunity could be increased by serums or vaccines, but the former were available only for certain infections while the latter could now be obtained for almost all bacterial infections.

PARIS

(From Our Regular Correspondent)

April 1, 1939.

Annual Meeting of American Hospital Board

After passing resolutions thanking Mr. E. B. Close for his services, without remuneration, as managing governor of the hospital, attention was called at the annual meeting of the board of governors to the fact that for the first time in the history of the American Hospital of Paris the budget for 1938 had been balanced. The medical, nursing and administration staffs were thanked by the board of governors for their untiring devotion. Services representing an income of more than two million francs (about \$55,000) were rendered to part pay and free patients during 1938. In addition to the American resident physician, whose length of service varies from one to three years, the hospital also receives three graduates of American medical schools for one year's service. The nurses' training school was discontinued because of lack of funds a few years ago, but there are seventy graduate nurses from various American and European hospitals.

During the past year, donations amounting to more than 450,000 francs (\$13,000) were received. The total number of inpatient days was 32,719, of which 11,260 were ward patient days. On an average forty-one patients were treated daily in the outpatient department.

Radiophotography in the Diagnosis of Tuberculosis

Examination of large groups of persons for pulmonary tuberculosis entails an almost prohibitive expenditure if films are used in every case; hence in France at least it has been necessary to limit examination of the lungs to radioscopy. At the January 31 meeting of the Académie de médecine of Paris a method termed radiophotography as employed at Rio de Janeiro, Brazil, by Dr. Manuel de Abreu was described by Dr. Georges Ronneaux of Paris. Radiophotography, or indirect radiography, consists in simultaneously photographing the thoracopulmonary images as they are observed at radioscopic examination. The camera is similar to the cameras sold everywhere for making cinematographic films. The photographs of the radioscopic images are too small to be studied directly, but they can be examined with the aid of a magnifying glass or can be enlarged for lantern slides or films of adequate dimensions, to be inspected as would be ordinary 14 by 17 inch films of the chest. When these enlargements are compared with the minute images obtained by the cinematograph, it is found that every detail observed during the radioscopic examination is preserved. The advantages of this newer method of radiophotography are that the films can be studied at a time when the radiographer is not engaged in the examination of many persons and that the expense is minimal as compared with that of making a film of every chest. When positive evidence is noted at radioscopic examination, the latter is followed by the older method of exposing the larger films.

Radiophotography is primarily a method to be recommended for the examination of large groups of school children, soldiers, sailors and hospital and industrial personnel and for use in dispensaries for the detection of pulmonary tuberculosis early

in its evolution. A number of films were shown by Dr. Ronneaux of patients at the Hôpital Cochin of Paris. He has perfected an apparatus, termed an oscillostrator, so that the recently introduced method of tomography, or the study of lesions of the chest in sections (pulmonary stratigraphy), can be combined with Dr. Manuel de Abreu's method of radiophotography. With the aid of the oscillostrator, instead of being obliged to use seventy-two large films for nine patients, at an expense of 1,800 francs, he found it necessary to expose only eighteen large films, of areas which required special study, at an expense of only 395 francs.

Treatment of Obliterating Arteritis

At the February 28 meeting of the Académie de médecine a paper was read by Dr. Jean Walser and his co-workers in which the results of the treatment with alternate compression and decompression of twelve patients with obliterating arteritis were reported. This method has been extensively used in the United States. A marked improvement was noted in nine patients. The apparatus employed was that of Drs. Rosenfeld and Garsaux, described in the July 7, 1937, *Presse médicale*. No difference in the results was noted so far as sex was concerned. The improvement was especially of a functional character, but little relief of the pain being noted in spite of a progressive diminution of the index. A marked improvement in the trophic changes, especially in the cyanosis, was noted. The authors believe that this method of alternate compression and decompression is an important addition to the treatment of obliterative arteritis.

Incidence of Retroplacental Hemorrhage

According to an article by Drs. Trillat and Magnin in the December 1938 *Revue française de gynécologie*, sixty-six retroplacental hemorrhages were observed in 20,000 deliveries. In fourteen of the sixty-six cases there was an anomalous insertion of the placenta, but clinically these fourteen cases did not differ in any respect from those in which the placental insertion was normal. There are three clinical forms of retroplacental hemorrhage: 1. A mild form of which twenty cases have been observed; the fetus does not die in this form and the extent of separation does not exceed more than half the surface of the placenta. 2. A moderately severe form, with death of the fetus but survival of the mother; there were forty-two cases of this form. 3. The severe form, which is rare, only four cases being observed, with a maternal mortality rate of 25 per cent. Albuminuria was not found in any of the sixty-six cases. The prognosis is far less favorable in multiparas and in general beyond the age of 30 years. The earlier the symptoms appear, the less favorable the prognosis. The total fetal mortality was 66 per cent and it does not appear possible at the present time to lower this high mortality rate. Medical treatment is indicated for the mother. Following artificial rupture of the bag of waters, further obstetric intervention should be undertaken with caution, because of danger of rupture of the uterus. Surgical treatment was never employed by the authors, who believe that it is rarely indicated.

Danger of Epidemics from Spanish Refugees

The French army and public health service deserve credit for the manner in which 400,000 Spanish military and civilian refugees have been vaccinated and cared for in various portions of France. In an article by Dr. Sautet of Marseilles which appears in the February 25 issue of *Presse médicale*, attention is called to the danger that two diseases which are prevalent in Spain and northern Africa, viz.: Spanish recurrent fever and malaria, may be brought into France by the refugees. The incidence of these two forms of infection is small in European France. Spanish recurrent fever is due to *Treponema hispanicum* and is transmitted to human beings by bites of the ordinary tick and the tick found on dogs. Malarial infection is

especially to be feared in the spring; hence it will be necessary for the French public health service to isolate persons who have had malaria as soon as any signs of recurrence appear.

Twenty-Fifth Anniversary of Biochemical Society

The French Biochemical Society was founded in 1914. To celebrate its twenty-fifth anniversary, a meeting will be held at the Maison de chimie May 26. Two foreign biochemists will read papers at the afternoon session. Professor Thunberg of Sweden will discuss the active role of hydrogen and of water in the phenomena of biologic oxidation, and Professor Polonovski will speak on twenty-five years of biochemistry. Foreign biochemists desiring to attend are asked to write to Mr. René Fabre, 149 rue de Sèvres, Paris.

BERLIN

(From Our Regular Correspondent)

March 20, 1939.

Protection of Hospitals Against Aerial Attack

The national minister of aviation and commander-in-chief of air forces, Goering, has issued certain rules relative to the structural protection offered by civil and military hospitals and similar institutions against aerial attack. According to the air minister the proper protection of institutions that serve public health can be a vital factor in the capability of a population to resist aerial attack. It is emphasized that, in the choice of the site for a new hospital, possible danger of aerial attack should be considered as well as the hygienic requirements. Larger institutions that serve health should not be erected on sites manifestly vulnerable to aerial attack. Among extremely dangerous locations, the inner zones of cities and thickly built up areas may be reckoned. The total bed capacity of a civilian hospital or similar institution (with the exception of a university clinic) should not exceed 600 beds; military hospitals should not have more than 450 beds. Several smaller establishments at different locations are thus preferable to one large establishment. Adequate structural separation of various parts of an institution offers the best and most effective aerial protection. The pavilion system, however, is not recommended.

Air raid shelters must be constructed for the institution's personnel and patient population; there must also be especially protected emergency operating rooms. Shelters for bedfast patients and their nursing personnel should, if possible, be located in the basement. Separate shelters should be provided for patients with infectious disease. Special stipulations are made for air raid shelters in institutions for children, convalescents and old people. The architectural plans of new buildings are to include ample facilities for protection.

All civil and military hospitals should be inspected to determine whether any are so exposed that in the event of aerial attack the population would have to be evacuated. Hospitals dangerously situated should maintain their present size even if under normal conditions expansion would be demanded; in the course of time they should be torn down. If in any of the extant hospital buildings it is found impossible to provide suitable shelters from aerial attack, either in the basement or on the ground floor, new outbuildings to serve as shelters should be constructed. In such hospitals certain space may be designated within the main building which could be used if an aerial emergency should occur before the regular shelters have been completed.

Debut of Physicians in Domain of Art

"The Doctor as Painter and Sculptor" is the title of an exhibition in Berlin from February 12 to March 12 under the auspices of the Empress Frederick House for Graduate Medical Affairs. Here, for the first time in Germany, physicians have made a public debut in the domain of art. Heretofore many doctors have been known to be endowed with musical

and literary talents, a number of doctors have been known who were writers and poets, and there are doctors' orchestras in Berlin, Vienna and Hamburg which have a good reputation. But nothing much has been known with regard to the extent to which physicians are active in the arts of painting and sculpture. Surprisingly, the jury of the exhibition was called on to choose from among 600 works of various kinds, including a number of carvings and chiseled forms. Among the 140 pieces selected for the exhibition, every genre, medium and technic was represented from the woodcut to the etching, from the small aquarelle, through the pastel and tempera to large-scale painting in oil, as well as wood carving and bronze casting. As many sided as the artistic aspect of the exhibition is its personal side. All types of medical men are represented, from the student to the ordinarius, from the country practitioner to the metropolitan specialist. That neurologists possess a special predilection for the brush and palette becomes evident at a first perusal of the catalogue. Virtually all the entries can be considered above the level of average amateur performance and among them are to be found some really fine works of art.

ITALY

(From Our Regular Correspondent)

March 18, 1939.

Congress of Roentgenology

The thirteenth National Congress of the Società Italiana of Medical Roentgenology took place recently at Bari with Professor Pietro as president.

HYSTEOSALPINGOGRAPHY

Prof. Armando Rossi, speaker on the first topic, dealt with female sterility, ectopic pregnancy and abortion. He pointed out the clinical and social importance of hysterosalpingography, especially in relation to dermatography. He discussed the various causes of female sterility (congenital malformations, insufficient development, tumors and tubal stenosis) and advised the systematic performance of hysterosalpingography on all women who are sterile during the first year of marriage. The main characteristic of ectopic pregnancy is a special function of the uterus with periodic successive phases of contraction and dilatation, predominance of the phases of dilatation and prolonged phases of contraction. According to him, abortion from the so-called unknown causes may be due to (1) abortigenic causes on which the physician is not informed in the given case, (2) anatomic conditions and functional behavior of the uterus or (3) congenital hypoplasia of the female genitalia. Hysterosalpingography has important indications in prevention and treatment of abortion from demographic, social, clinical and medicolegal angles.

RADIOBIOLOGY OF SKIN

Professor Valenti, speaker on the second topic, said that radium and roentgen irradiations on the skin cause direct lesions to cutaneous cells with consequent temporary arrest of the functions of reproduction of the cell or death from necrosis of the nucleus. In the presence of dead cells the reparation of the basal epithelium takes place either by entrance of normal cells in the involved zone or by compensation of connective cells. If the skin is the seat of repeated irradiations in small doses, such as in the case of roentgenologists, trophic cutaneous alterations take place. The reactions of the skin to radium and roentgen irradiations are different in persons who have been previously treated by the same irradiations than in those who have not. The special behavior of the skin in these cases is due to the allergic factor.

IRRADIATIONS ON MEDIASTINUM

Professor Castronuovo pointed out the importance of roentgenology for the diagnosis and treatment of diseases of the mediastinum as well as other diseases related to physical and

psychic constitution. Roentgen irradiations are indicated in the treatment of bronchial asthma, whooping cough and hypertension.

RHEGMOGRAPHY AND STATIGRAPHY

Professors Cignolini and Gilardoni made demonstrations of an apparatus for rhegmography. The technic is original and has a place which is intermediate between seriography and kymography. Professor Vallbona presented a statigraph. Professors Palmieri and Monari reported a procedure for obtaining photographs of fluorescent screen on small x-ray films. The next congress will take place at Pisa with Professor Duranti presiding.

POLAND

(From Our Regular Correspondent)

April 3, 1939.

The Treatment of Syphilis

The Warsaw dermatologist Dr. Robert Bernhardt reported recently on the effect of treatment in 592 cases of primary and secondary syphilis. He discussed the question whether antisypilitic treatment could prevent the development of visceral or nervous syphilitic conditions. Every case was observed for not less than ten years unless visceral or nervous involvement had developed earlier. Some of the cases have been observed since 1900; in many the treatment was started before the discovery of *Spirochaeta pallida*, arsphenamine treatment and serologic tests. Of the 592 patients, 133 were treated exclusively with mercury compounds, forty with arsenicals and twenty-three with bismuth preparations. A combined treatment with arsphenamine and mercury compounds was used for 271, and in 125 cases arsphenamine and bismuth preparations were used.

With mercury compounds alone, the author says that an effective treatment should consist of from six to nine series of rubs with mercuric ointment. Every series lasts from six to eight weeks, the rubs being performed daily for six days a week and the daily dose being increased from 2.5 to 4 Gm. of mercuric ointment. The dose varies with the general condition of the patient; it is reduced if any complication develops in the gums, kidneys or colon or if a fall in body weight is observed. The treatment has to last from three to five years. While the ratio between the number of good and of ill effects obtained with mercuric treatment was 1 to 1.7, no late syphilitic complications were observed in six of seven adequately treated patients.

In the series of patients treated with arsphenamine or neo-arsphenamine alone, the ratio between good and ill effects was but 1 to 9. The author says that arsenical preparations act rapidly and effectively as far as symptomatic treatment of present syphilitic manifestations is concerned. As to prevention of later visceral recurrences, however, no evidence of any favorable influence has as yet been shown.

The treatment with bismuth preparations was effective in preventing later syphilitic complications. Eight of nine patients treated exclusively with adequate doses of bismuth for a sufficient period showed no evidence of such complications. In the entire series of patients treated with bismuth preparations the ratio between good and ill effects was 1 to 0.35. An adequate bismuth treatment should last from two to four years and consist of from five to nine series of from eight to ten weekly injections, each containing 0.2 Gm. of metallic bismuth. The patients treated with bismuth seem to be less disposed to later development of neurosyphilis than those treated with other drugs.

Combined treatment with arsphenamine and mercury showed a ratio between good and ill results of 1 to 1.2. The incidence of good effects was higher if the treatment was adequate. This treatment should consist of simultaneous administration

of arsphenamine and a mercury preparation. The doses of each drug should not differ from the effective doses administered when the two are given separately. The same is to be said concerning combined treatment with arsphenamine and a bismuth preparation. In this series of cases the ratio between good and ill effects was 1 to 0.78. The results of combined treatment with arsphenamine and mercury and with arsphenamine and bismuth do not differ distinctly.

In conclusion, the author says that arsphenamine has not fulfilled expectations in the prevention of late visceral or nervous manifestations of syphilis.

Relation of Hypoglycemia to Hypotonia

Dr. H. Fiszel published a paper on carbohydrate metabolism in hypotonic states. He focused attention on the striking resemblance of the clinical picture of constitutional hypotonia to hypoglycemic states, which could be observed in hyperinsulinism as well as in hypoglycemia provoked for therapeutic or experimental purposes. Thus constitutional hypotonia seems to be related to hypoglycemic conditions. To throw light on this problem the author studied the blood sugar content in primary and secondary hypotonia, particularly in the glycemic curve before and after oral administration of 50 Gm. of dextrose. The research was carried out with forty patients with primary, i. e. constitutional, hypotonia as well as with subjects with secondary hypotonia, i. e. hypotonia due to such factors as heart failure and infectious diseases. There was a great difference between the shapes of the curves obtained in the two conditions. In comparison with normal records, the curve in constitutional hypotonia has been characterized by an initial subnormal level of blood sugar, an early and relatively low peak and a rapid drop, with a final deep hypoglycemic depression. In secondary hypotonia too initial hypoglycemia was present, but the peak of the curve was much higher and delayed and no final subnormal depression was shown. In some instances, in which the clinical differentiation between primary and secondary hypotonia was difficult, the curve had a medium or fairly normal shape.

The author says that there is in constitutional hypotonia a tendency to an absolute increase in the tonus of the vagal system and of the endocrine glands synergistic with insulin, while in secondary hypotonia the increase in the tonus of the vagus-insulin is relative and due to a decrease in the tonus of the sympathetic adrenal system. Further research should show whether the glycemic curve might aid in differentiating between primary and secondary hypotonia.

A Rheumatism Institute

The health authorities have decided to establish a Polish rheumatism institute to insure research on rheumatism and postgraduate education of physicians in rheumatology. There has been as yet no such institution in Poland.

Marriages

FREDERICK RUSSELL HASELTON, Lieutenant Commander, U. S. Navy, to Mrs. Ebba Hovey Hall at Great Lakes, Ill., April 14.

DALLAS NORMAN THOMPSON to Mrs. Emmie de L. Hambaugh Robinson, both of Elberton, Ga., March 18.

ROLF ANDREAS QUISLING to Miss Marie J. Sweeney, both of Madison, Wis., in Dubuque, Iowa, March 16.

SAUL RICHARD KAPLAN, Brooklyn, to Miss Reva Syril Stein of Fayetteville, N. C., March 12.

MICHAEL A. SALEEBY, Dillon, S. C., to Miss Mary G. Saleeby of Florence, March 22.

MORTON SELWYN KAUFMAN to Miss Janice Loeb, both of Washington, D. C., March 30.

RICHARD O. FLETT to Miss Alfreda Sharpe, both of Detroit, in Buffalo, March 21.

Deaths

William Edward Morgan, Chicago; Chicago Medical College, 1882; prosector in anatomy, 1881-1882, demonstrator in anatomy in 1885, demonstrator in operative surgery in 1887, professor of surgical anatomy and operative surgery in 1892, professor of clinical surgery, 1902-1920, and in 1924 was appointed medical counselor at his alma mater; professor of general and clinical surgery, Loyola University School of Medicine, 1920-1929, and since 1929 professor emeritus; past president of the Chicago Surgical Society; formerly on the staffs of the Mercy Hospital, Englewood Hospital, German Deaconess Hospital, Provident Hospital, Washington Park Hospital and the Jackson Park Hospital; aged 80; died, April 25, of chronic myocarditis and arteriosclerosis.

Arthur Vallée, Quebec, Que., Canada; Laval University Faculty of Medicine, Quebec, 1905; secretary and professor of pathological anatomy at his alma mater; from 1908 to 1912 director of the Municipal Laboratory, after serving as laboratory head at Hotel Dieu Hospital; in 1916 president of the eighth Congress of French-Speaking Physicians of America; was created a Chevalier of the Legion of Honor by the French Government during the jubilee of King George V and again at the coronation of King George VI.; member of the Royal Society of Canada, French Association for Study of Cancer, Royal College of Physicians and Surgeons of Canada and other medical societies; aged 56; died, January 8.

Leo Steiner, Chicago; Jenner Medical College, Chicago, 1906; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; member of the Illinois State Medical Society; instructor in medicine, 1911-1913, instructor in materia medica, 1913-1914, associate professor of materia medica and therapeutics, 1914-1915, and professor of materia medica and therapeutics, 1915-1916, Bennett Medical College; formerly superintendent of the Illinois Eye and Ear Infirmary; aged 55; died, January 7, of carcinoma of the colon with metastases to the liver.

Arthur Melville Shradly Ⓢ New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1893; instructor in physical diagnosis, Jan. 1, 1902, to June 30, 1907, chief of clinic and instructor in hydrotherapy, July 1, 1907, to June 30, 1908, and instructor in hydrotherapy, July 1, 1908, to June 30, 1913, at his alma mater; served in various capacities on the staffs of the Seton Hospital, Harlem Hospital, Herman Knapp Memorial Eye Hospital and the Harlem Eye, Ear and Throat Hospital; aged 69; died, January 14, of heart disease.

Alexander John MacKenzie, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1900; fellow of the American College of Physicians; formerly senior demonstrator in medicine at his alma mater; president of the Ontario Medical Association and past president and counselor of the Toronto Academy of Medicine; served during the World War; for many years physician to the Upper Canada College; on the staff of St. Michael's Hospital; aged 63; died, March 3.

Lewis Cass Tisdale Ⓢ Milwaukee; Wisconsin College of Physicians and Surgeons, Milwaukee, 1901; formerly associate clinical professor of surgery at Marquette University School of Medicine; for many years chief of staff at Misericordia, Deaconess, Mount Sinai and the old Trinity Hospital and a member of the consulting staff of the old Johnston Emergency Hospital; aged 60; died, January 12, of hypertensive cardiovascular disease and cerebral hemorrhage.

John David Thomas, West Rupert, Vt.; University of Vermont College of Medicine, Burlington, 1916; member of the Vermont State Medical Society; served during the World War; on the staffs of the Putnam Memorial Hospital, Bennington, Mary McClellan Hospital, Cambridge, N. Y., Emma Laing Stevens Hospital, Granville, N. Y.; aged 48; died, January 31, of coronary occlusion and arteriosclerosis.

Vard Houghton Hulén, San Francisco; College of Physicians and Surgeons of Chicago, 1887; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1888; in 1911 member of the House of Delegates of the American Medical Association; fellow of the American College of Surgeons; aged 73; died, January 14, of chronic myocarditis and cerebral thrombosis.

William Vaughn Stanfield, Attica, Ind.; Medical College of Indiana, Indianapolis, 1904; bank president; formerly county health officer; served during the World War; at one time member of the city council, county board of health and chair-

man of the board of health of Attica; aged 62; died, January 7, in the Methodist Hospital, Indianapolis, of coronary thrombosis.

Cassius M. C. Willcox, Kirksville, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1891; member of the Missouri State Medical Association; served during the World War; formerly county coroner, health officer and county physician, and member of the state legislature; aged 68; died, January 24, of carcinoma of the throat.

Frederick Charles Steinmetz, New York; Columbia University College of Physicians and Surgeons, New York, 1912; member of the American Urological Association; a member of the staff of the department of urology, James Buchanan Brady Foundation of the New York Hospital; aged 52; died, January 22, of heart disease.

John Fulton Roe, Los Angeles; Rush Medical College, Chicago, 1899; fellow of the American College of Surgeons; formerly surgeon to St. Joseph's Hospital, Denver, and chief surgeon to the Denver and Rio Grande Western Railroad System; aged 66; died, January 29, of hypertension and arteriosclerosis.

J. A. E. Beaudoin, Montreal, Que., Canada; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University at Montreal, 1892; formerly governor of the College of Physicians and Surgeons of the Province of Quebec and of Notre Dame Hospital; aged 73; died, January 7.

Frederick Josias Wurtele, North Platte, Neb.; University and Bellevue Hospital Medical College, New York, 1906; member of the Nebraska State Medical Association; served during the World War; aged 61; died, January 17, in the Lincoln (Neb.) General Hospital, of cerebral hemorrhage.

Wilmot Edwin Patterson Ⓢ Westbrook, Minn.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1906; past president of the Southwestern Minnesota Medical Society; aged 56; died, January 15, in Slayton, of hemolytic streptococcal throat infection and septicemia.

Charles Joshua Tucker Ⓢ Rochester, N. Y.; University of the City of New York Medical Department, 1883; veteran of the Spanish-American War; on the staff of St. Mary's Hospital; aged 79; died, January 25, of hypertensive heart disease and cerebral hemorrhage.

Robert Lee Tye Ⓢ McDonough, Ga.; Bellevue Hospital Medical College, New York, 1885; past president of the Henry County Medical Society; aged 73; was drowned, January 8, when his automobile went over a bridge and pinned him down in 3 feet of water.

Lewis Edward Turrentine, Tahoka, Texas; Southwestern University Medical College, Dallas, 1909; member of the State Medical Association of Texas; county health officer; aged 53; died, January 29, in a hospital at Lubbock of acute myocarditis and pneumonia.

Edgar Eginton Stewart Jr., New York; Columbia University College of Physicians and Surgeons, New York, 1936; aged 29; died, January 16, in the Charles EsDorn Hospital, Walterboro, S. C., of injuries received in an automobile accident.

Robert Emmett Silverstein Ⓢ Tylertown, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1898; formerly mayor; on the staff of the Tylertown Hospital; aged 71; died, January 2, of heart disease and hypernephroma.

Given Addison Light, Salt Lake City; Georgetown University School of Medicine, Washington, D. C., 1906; member of the Utah State Medical Association; served during the World War; aged 61; died, January 11, of coronary disease.

William Mannen Young, Bloomington, Ill.; Eclectic Medical Institute, Cincinnati, 1897; member of the Illinois State Medical Society; on the staffs of St. Joseph's Hospital and Mennonite Hospital; aged 71; died, January 19, of heart disease.

David W. Reid, Jacksonville, Ill.; Chicago Homeopathic Medical College, 1889; member of the Illinois State Medical Society; on the staff of the Passavant Memorial Hospital; aged 83; died, January 15, of bilateral bronchopneumonia.

Charles Whelan, Washington, D. C.; Medical College of Alabama, Mobile, 1896; a member of the United States Board of Parole, Department of Justice; aged 65; died, January 28, in the Garfield Hospital of cerebral hemorrhage.

Allen Gano Wainright, Tulsa, Okla.; Washington University School of Medicine, St. Louis, 1902; member of the Oklahoma State Medical Association; served during the World War; aged 59; was shot and killed in January.

Louis Severin, Bluffton, Ind.; Miami Medical College, Cincinnati, 1899; past president of the Wells County Medical Society; formerly city and county health officer; aged 68; died, January 23, of a self-inflicted bullet wound.

Alexander Augustus Sizer, Schuylers, Va.; University College of Medicine, Richmond, 1899; member of the Medical Society of Virginia; served during the World War; aged 68; died, January 10, of cerebral hemorrhage.

John J. Carmody, Huntington, Mass.; St. Louis College of Physicians and Surgeons, 1924; served during the World War; aged 60; died, January 20, in the Mercy Hospital, Springfield, of influenza and coronary artery disease.

Le Roy Albert Woodward @ Worcester, Mass.; Tufts College Medical School, Boston, 1914; on the staff of the Harvard Private Hospital; aged 56; died, January 22, of lobar pneumonia and pneumococcal meningitis.

Philippe Richer, Montreal, Que., Canada; School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1907; aged 55; was found dead in January of poison, self administered.

John Irwin Taylor, Elizabethtown, Ky.; University of Louisville School of Medicine, 1918; member of the Kentucky State Medical Association; aged 45; died, January 27, in the Baptist Hospital, Louisville, of uremia.

Abraham Benjamin Grossman, Cleveland; Western Reserve University School of Medicine, Cleveland, 1914; served during the World War; aged 49; died, January 10, in Miami Beach, Fla., of coronary thrombosis.

Harry Clauet Payne, Paris, Mo.; University of Missouri School of Medicine, Columbia, 1903; member of the Missouri State Medical Association; aged 59; died, January 12, of carcinoma of the colon with metastases.

Paul Jerome Todd, Canton, China; Kansas Medical College, Medical Department of Washburn College, Topeka, 1902; fellow of the American College of Surgeons; aged 65; died, January 16, of coronary thrombosis.

George W. Middleton, Salt Lake City; University of Louisville (Ky.) Medical Department, 1894; member of the Utah State Medical Association; formerly mayor of Cedar City; aged 72; died, Dec. 3, 1938.

Frank Edward Schram @ Chicago; Chicago College of Medicine and Surgery, 1915; served during the World War; aged 49; died, January 16, in St. Luke's Hospital following an operation for acute appendicitis.

James Bonney Sudduth, Clayton, Mo.; Barnes Medical College, St. Louis, 1904; member of the Missouri State Medical Association; formerly health commissioner; aged 82; died, January 28, of arteriosclerosis.

Clarence A. Wells @ Quincy, Ill.; Missouri Medical College, St. Louis, 1897; aged 68; on the staffs of the Blessing Hospital and St. Mary's Hospital, where he died, January 15, of injuries received in a fall.

Adolph Reinhardt Wittman, Merrill, Wis.; Rush Medical College, Chicago, 1888; formerly mayor, health commissioner and member of the board of education; aged 79; died, January 11, of cerebral hemorrhage.

Alfred Edward Oakes, Elizabeth, N. J.; University and Bellevue Hospital Medical College, New York, 1913; served during the World War; aged 52; died, Dec. 20, 1938, in the Alexian Brothers Hospital.

Hugh Morrow, Patton, Pa.; College of Physicians and Surgeons, Baltimore, 1908; aged 63; died, January 9, in the Miners' Hospital of Northern Cambria, Spangler, of chronic nephritis and myocarditis.

John Shaw Gibson, Gibson, N. C.; University of Maryland School of Medicine, Baltimore, 1905; member of the Medical Society of the State of North Carolina; aged 59; died, January 24, of coronary occlusion.

Darwin Schott, Champaign, Ill.; Homeopathic Medical College of Missouri, St. Louis, 1903; served during the World War; aged 58; died, January 30, in the Burnham City Hospital of cirrhosis of the liver.

Randolph Moore Gilliam, Chicago; University of Virginia Department of Medicine, Charlottesville, 1919; aged 43; died, January 14, in the University Hospital, Charlottesville, Va., of rheumatic heart disease.

Henry Augustus Kling, Flint, Mich.; Eclectic Medical Institute, Cincinnati, 1906; served during the World War; aged 65; died, January 24, in St. Joseph Mercy Hospital, Pontiac, of cerebral hemorrhage.

Abraham Mintz, Newark, N. J.; Rush Medical College, Chicago, 1931; member of the Medical Society of New Jersey; aged 34; died in January at the Presbyterian Hospital of chronic myelogenous leukemia.

Harry Webster Powers, Amherst, Ohio; Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1886; aged 74; died, January 16, of cerebral hemorrhage.

Richard George Tietze Jr. @ Winter Haven, Fla.; Long Island College Hospital, Brooklyn, 1936; aged 28; died, January 5, in a hospital at Lakeland of injuries received in a motorcycle accident.

James Carroll Patterson @ Marengo, Iowa; John A. Creighton Medical College, Omaha, 1910; past president of the Iowa County Medical Society; aged 58; died, January 18, of lobar pneumonia.

Edward Elisha Pierce, Exeter, R. I.; Harvard University Medical School, Boston, 1890; member of the Rhode Island Medical Society; aged 82; died, January 28 in Providence, of coronary occlusion.

William Cabell Rives, Washington, D. C.; University of the City of New York Medical Department, 1877; member of the Medical Society of the District of Columbia; aged 88; died, Dec. 17, 1938.

Charles F. Marston, Providence, R. I.; College of Physicians and Surgeons, Baltimore, 1888; aged 74; died, January 5, in the Rhode Island Hospital of coronary thrombosis and prostatic hypertrophy.

Henry Justin Roddy Jr. @ Lancaster, Pa.; Jefferson Medical College of Philadelphia, 1925; served during the World War; aged 41; died, January 11, of illuminating gas poisoning, self administered.

Theodore Dodd @ Steubenville, Ohio; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1907; on the staff of the Gill Memorial Hospital; aged 71; died, Dec. 22, 1938.

Edwin Tracy Rhodes @ York, Pa.; University of Rochester School of Medicine, 1935; aged 28; died, January 26, in the Bryn Mawr (Pa.) Hospital of influenza, pneumonia and encephalitis.

Joseph Marshall Reed, Pittsburgh; Medical-Chirurgical College of Philadelphia, 1904; served during the World War; aged 61; died, January 30, in St. Petersburg, Fla., of cerebral hemorrhage.

George L. McLaughlin, Chicago; Rush Medical College, Chicago, 1900; member of the Illinois State Medical Society; aged 63; died, January 18, in Rochester, Minn., of carcinoma of the colon.

George B. McCutcheon, Detroit; Michigan College of Medicine, Detroit, 1883; Detroit Medical College, 1885; aged 81; died, January 13, of hypertrophy of the prostate and fracture of the hip.

Robert B. South, Rea, Pa.; Baltimore Medical College, 1896; aged 72; died, Nov. 21, 1938, in the Mercy Hospital, Pittsburgh, of hypertensive heart disease, nephritis and diabetes mellitus.

Lyle F. Hansbrough @ Front Royal, Va.; University of Virginia Department of Medicine, Charlottesville, 1901; aged 59; died, January 22, of acute nephritis and hypertensive heart disease.

Charles A. Paddock, Portland, Ind.; Physio-Medical College of Indiana, Indianapolis, 1901; formerly mayor, city and county health officer; aged 64; died, January 18, of heart disease.

Clark L. Phillips, Superior, Neb.; University of Nebraska College of Medicine, Omaha, 1912; aged 53; died, January 28, at the Hastings State Hospital, Ingleside, of coronary thrombosis.

Frederick Almon Steele, Hall Moon Bay, Calif.; University of Vermont College of Medicine, Burlington, 1884; aged 74; died, January 18, of prostatic hypertrophy with obstruction.

Bernhard Kugelmann @ New York; Ludwig-Maximilians-Universität Medizinische Fakultät, München, Bavaria, Germany, 1923; aged 38; died, Dec. 24, 1938, in the Wickersham Hospital.

Robert Nathaniel Cox, Verdi, Va.; Bennett Medical College, Chicago, 1914; aged 60; died, January 28, in the Holston Valley Community Hospital, Kingsport, Tenn., of pneumonia.

Fred L. Murdock, Manhattan, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1906; also a dentist; aged 72; died, January 12, of diabetes mellitus.

Clark Edwin Sargent, Detroit; Rush Medical College, Chicago, 1895; aged 71; died, January 25, in the Providence Hospital of uremia, diabetes mellitus and chronic nephritis.

Ubert Conrad Vincent, New York; University of Pennsylvania School of Medicine, Philadelphia, 1918; formerly on the staff of the Harlem Hospital; aged 46; died, Dec. 18, 1938.

John Jay Waite, Deerfield, Ohio; Cleveland Homeopathic Medical College, 1900; member of the Ohio State Medical Association; aged 78; died, January 26, of heart disease.

Dorothea Willson Dekau Palamountain, Oakland, Calif.; Cooper Medical College, San Francisco, 1905; formerly physician for the city public schools; aged 57; died, January 3.

Owen G. Blackwell, Pine Bluff, Ark.; Tulane University of Louisiana School of Medicine, New Orleans, 1901; member of the Arkansas Medical Society; aged 65; died, January 6.

Charles Willis Duffin, Guttentberg, Iowa; Rush Medical College, Chicago, 1881; member of the Iowa State Medical Society; aged 79; died, January 19, of coronary sclerosis.

Donald Walter McKay, Nelson, B. C., Canada; University of Toronto Faculty of Medicine, 1918; L.R.C.P., London, M.R.C.S., England, 1922; aged 44; died, Dec. 28, 1938.

Earnest L. Meredith, Omaha; Barnes Medical College, St. Louis, 1909; aged 54; died, January 27, in the Immanuel Hospital of Hodgkin's disease and bronchopneumonia.

John Mair Robertson, Vancouver, B. C., Canada; L.R.C.S., Edinburgh, Scotland, 1882; University of Glasgow Medical Faculty, 1883; aged 80; died, Dec. 28, 1938.

James N. Kirk, Eagle Lake, Maine; Jefferson Medical College of Philadelphia, 1889; aged 71; died, January 16, in Roanoke, Va., of perinephric abscess and stone.

Charles Campbell Stanton, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1902; aged 60; died, January 11, of a self-inflicted bullet wound.

John Forster Orr, Chicago; Victoria University Medical Department, Coburg, Ont., Canada, 1886; aged 80; died, January 8 of myocarditis and arteriosclerosis.

Martin Lawson Smail ☉ New London, Conn.; University of Vermont College of Medicine, Burlington, 1893; aged 71; died, January 21, of chronic myocarditis.

Matthew Reed McBurney, Los Angeles; Hahnemann Medical College and Hospital of Philadelphia, 1899; aged 68; died, January 15, of chronic myocarditis.

John Tazewell Nolen ☉ Poca, W. Va.; University College of Medicine, Richmond, 1910; aged 54; died, January 13, in a hospital at Charleston of myocarditis.

Edward Olinger Wilson, Madison, Neb.; John A. Creighton Medical College, Omaha, 1909; aged 59; died, January 9, in Bluebell, S. D., of heart disease.

Allard S. Lewis, Green Sea, S. C.; Baltimore University School of Medicine, 1897; aged 68; died, January 17, of coronary thrombosis and hypertension.

Peter Wesley Byers, Arcanum, Ohio; Medical College of Ohio, Cincinnati, 1900; formerly member of the board of education; aged 74; died, Dec. 25, 1938.

Benness Simpson Smith, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1912; aged 52; died, January 3, of chronic nephritis.

Joseph Scholfield Brooks, San Francisco; Hahnemann Hospital College of San Francisco, 1894; aged 66; died, January 22, of intestinal obstruction.

Frederick F. Zelle ☉ St. Louis; Washington University School of Medicine, St. Louis, 1906; aged 59; died, January 19, in the De Paul Hospital.

Durand W. Youngblood, Greenville, S. C.; College of Physicians and Surgeons, Baltimore, 1886; aged 81; died, January 9, of coronary occlusion.

John F. Courtney, Joliet, Ill.; Chicago Homeopathic Medical College, 1894; member of the Illinois State Medical Society; aged 77; died, Dec. 27, 1938.

William Henry Vose, Long Beach, Calif.; Colorado School of Medicine, Boulder, 1897; served during the World War; aged 69; died, January 14.

John Mathew Wells ☉ Bristow, Okla.; University of Nashville (Tenn.) Medical Department, 1909; aged 63; died, January 25, of pneumonia.

Thomas L. Nutter, Belle, W. Va.; Louisville (Ky.) Medical College, 1898; aged 66; died, January 16, in a hospital at Charleston of myocarditis.

Placido Venuto ☉ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1934; aged 34; died, January 15, of bronchopneumonia.

William H. Mudge, Port Tampa City, Fla. (licensed in Florida in 1903); aged 77; died, January 21, of cerebral hemorrhage and hypertension.

Charles S. Stewart, Amite, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1884; aged 78; died in December 1938.

Perry Norton Whitney, Arkansas City, Kan.; Eclectic Medical Institute, Cincinnati, 1890; aged 82; died, Dec. 6, 1938, in the Mercy Hospital.

H. Orrahood, Big Isaac, W. Va. (licensed in West Virginia, by years of practice); aged 90; died, January 29, of cerebral hemorrhage.

George W. Patchen, Melbourne, Fla.; Chicago Homeopathic Medical College, 1893; aged 67; died, January 8, of coronary thrombosis.

Clinton C. Hall, North East, Pa.; College of Physicians and Surgeons, Baltimore, 1884; aged 79; died, January 9, of coronary thrombosis.

Armon C. Spooner, Spirit Lake, Idaho; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1905; aged 63; died, Dec. 31, 1938.

Samuel Perrin Rich, Tacoma, Wash.; Cincinnati College of Medicine and Surgery, 1902; aged 64; died January 11, of coronary sclerosis.

Robert John Kincaid, Mars Hill, Maine; Medical School of Maine, Portland, 1894; aged 75; died, January 1, of cerebral hemorrhage.

Eugene Y. Willis ☉ Culpeper, Va.; Medical College of Virginia, Richmond, 1903; aged 60; died, January 5, of cerebral hemorrhage.

Albert Edward Webb, Salem, Mass.; Tufts College Medical School, Boston, 1910; aged 64; died, January 11, in the Salem Hospital.

James Barna Witherington, Munford, Tenn.; Vanderbilt University School of Medicine, Nashville, 1878; aged 84; died, Dec. 22, 1938.

Jacob C. Fults, Waterloo, Ill.; St. Louis Medical College, 1885; aged 77; died, January 30, at Shelbyville, Ind., of a cerebral hemorrhage.

Taylor Russell Baldrige, Dayton, Ohio; Medical College of Ohio, Cincinnati, 1888; aged 77; died, January 22, of cerebral hemorrhage.

William O'Connor, Paterson, N. J.; Albany (N. Y.) Medical College, 1914; aged 65; died, January 30, of cerebral hemorrhage.

Raymond Reed Roberts, Lawrenceville, Ga.; Emory University School of Medicine, Atlanta, 1922; aged 42; died, January 5.

James William McAdow, De Kalb, Mo.; University Medical College of Kansas City, 1908; aged 55; died, January 8, of teratoma.

Arthur Henry Orcutt ☉ Oakland, Calif.; University of Illinois College of Medicine, Chicago, 1918; aged 46; died, Dec. 12, 1938.

William Gibson Hulme, Danville, Ga.; Hospital Medical College, Atlanta, 1910; aged 49; died, January 7, of angina pectoris.

Hugo von Dessauer, Brooklyn; Long Island College Hospital, Brooklyn, 1896; also a pharmacist; aged 60; died, January 2.

John Rossiter Gleason, Cleveland Heights, Ohio; Homeopathic Hospital College, Cleveland, 1889; aged 77; died, January 30.

Fred S. Brown, Oklahoma City; Missouri Medical College, St. Louis, 1893; aged 65; died, January 16, of cerebral hemorrhage.

David Caw Wilson, Park Hill, Ont., Canada; Trinity Medical College, Toronto, Ont., Canada, 1899; died, Dec. 19, 1938.

John M. Fewkes, Rio Grande City, Texas; Hospital College of Medicine, Louisville, Ky., 1895; aged 70; died in January.

Henry H. Imhofe, Baltimore; Baltimore University School of Medicine, 1893; aged 70; died, January 2, of gastric ulcer.

Roscoe Granville Blanchard ☉ Dover, N. H.; Medical School of Maine, Portland, 1884; aged 85; died, January 12.

William James Stevenson, Aurora, Ont., Canada; Trinity Medical College, Toronto, 1887; aged 74; died, January 22.

Fred Eugene Ladd, Antrim, N. H.; College of Physicians and Surgeons, Boston, 1902; aged 67; died, Dec. 22, 1938.

Alice Lyon Fitch, Stratford, Conn. (licensed in Connecticut in 1901); aged 60; died, January 30, of arteriosclerosis.

William H. Martin, Carlisle, Ky.; University of Louisville Medical Department, 1889; aged 73; died, January 27.

Guy Frank Rogers, Los Angeles; Toledo (Ohio) Medical College, 1897; aged 65; died, Dec. 29, 1938.

Correspondence

SULFAPYRIDINE

To the Editor:—The February 11 issue of THE JOURNAL contains two original articles dealing with a clinical trial of sulfapyridine, an editorial comment, a report to the Council on Pharmacy and Chemistry, as well as a letter in the correspondence columns. Because my contributions to this subject are generously acknowledged and quoted, you will perhaps allow me space to correct one or two misquotations, as well as to comment on some of the conclusions.

I would refer you in the first place to Dr. Long's, in many ways admirable but nevertheless somewhat pragmatic, pronouncement to the Council on Pharmacy and Chemistry (p. 538). I am there said to have "stated without giving experimental detail that sulfapyridine was also an active chemotherapeutic agent in the treatment of staphylococcal infections." The reference given is to my Bradshaw lecture to the Royal College of Physicians, which in its published form contains two protocols concerning staphylococcal infections, the one detailed and the other composite. Dr. Long also quotes me as stating "that in experimental infections the drug acts by bringing about degenerative changes in the capsular material of the pneumococcus." In the publications to which reference is made, I have gone no further than to record that capsular changes are found during the course of a treated experimental infection. I have most carefully refrained from judging the significance of this capsular change until I had made a considerable study. My conclusions have lately been published (McIntosh, James, and Whitby, L. E. H.: *Lancet* 1:431 [Feb. 25] 1939). I am surprised that Dr. Long has been unable to confirm my observation "that mice infected with pneumococci and treated with sulfapyridine are immune on recovery to infection with the homologous organisms." This phenomenon, first observed by Buttle (*Proc. Roy. Soc. Med.* 31:154 [Dec.] 1937) with sulfanilamide and pneumococci, has in my own hands been demonstrated so frequently and with such constancy that it has formed the basis for observations concerning the mode of action of sulfanilamide derivatives.

It is unfortunate that Dr. Long's deductions should precede the publication of his experimental protocols; without these one can neither make extensive comment nor criticize the technic on which his conclusions are based. But, as fair comment, one may say that if, with the technic employed, this immunity phenomenon to pneumococci has not been observed, then the remaining experimental work, with its tepid conclusions as to the activity of sulfapyridine, may perhaps also be explained by differences in technic.

I submit that my own experimental results, which show that sulfapyridine is vastly superior to sulfanilamide in the treatment of experimental pneumococcal infections, which results have been completely confirmed by Fleming's in vitro work (*Lancet* 2:74 [July 9], 564 [Sept. 3] 1938), and that the word "vastly" is a much more accurate description than that given by Dr. Long, who admits merely that sulfapyridine is "somewhat superior." Were Dr. Long's estimate correct, then during the three years that sulfanilamide has been widely used there should surely have been more than a mere handful of successes (usually type III) claimed for sulfanilamide in pneumococcal infections. As it is, during the mere nine months in which sulfapyridine has been available in limited amounts there have been clearcut reports concerning its effectiveness in the clinical field, and these have been made by competent observers in England, Africa and America; the two articles in your issue of February 11 are admirable examples.

The letter of Drs. Bullowa, Plummer and Finland (p. 570) opens with a ponderous warning concerning the futility of "many agents, chemical, physical and biologic, that have been recom-

mended for the treatment of pneumonia." So far as I am aware, few if any of the "recommendations" quoted in the list have been based on extensive experimental work giving consistent results; such remedies cannot, therefore, justifiably be bracketed with sulfapyridine. The same letter contains a special plea for the continued use of serum therapy. In relation to this point, a paragraph in the original article of Drs. Flippin, Lockwood, Pepper and Schwartz (p. 531) contains the following significant statements: "Several patients who had received large doses of serum without apparent effect were given sulfapyridine and recovered," and "We instituted treatment . . . regardless of complications or the apparent terminal condition." The successes claimed for serum would be greatly altered by this test, for it is well known that a critical result with serum can be expected only when the patient is treated in a satisfactory stage of the disease.

The United States of America can provide a large amount of material for assessment under controlled conditions. It is earnestly to be hoped that further trials with sulfapyridine will produce the consistent clinical results that have already been reported from America.

LIONEL E. H. WHITBY, M.D. (CAMP.), F.R.C.P. (LOND.)

Bland-Sutton Institute of Pathology,
Middlesex Hospital, London, W. 1.

To the Editor:—I am sorry that Dr. Whitby has taken exception to parts of the report which I made to the Council on Pharmacy and Chemistry concerning the experimental and clinical status of sulfapyridine (THE JOURNAL, February 11, p. 538). I have no desire to enter into a controversy with him over our respective views on the experimental effects of sulfapyridine, as such a course wastes time and effort and rarely serves a useful purpose. However, since Dr. Whitby feels that he has been misquoted, both as to the content of his work and as to the interpretations which he has derived from certain of his investigations, courtesy requires an answer.

A rereading of Dr. Whitby's Bradshaw lecture (*Lancet* 2:1095 [Nov. 12] 1938) still leads me to the belief that "experimental detail" is lacking in his report concerning the therapeutic efficiency of the drug in staphylococcal infections in mice. It is well known that mice are quite resistant to experimentally produced staphylococcal infections, and while protocols of the results of experiments are given in this paper there is no mention of the origin of the strain of staphylococcus or the route or method of inoculation employed. Without this information a repetition of his experiments would be impossible.

Dr. Whitby's second point has some justification in that, although he wrote "the organisms showed degenerative capsular changes," he did not state that "the drug acts by bringing about changes in the capsular material" but said: "It [the drug] appears to exert a definite action upon the pneumococcus capsule" (*Lancet* 1:1210 [May 28] 1938). Apparently I interpreted his remarks too literally on this point.

As I mentioned before, I have not been able to confirm Dr. Whitby's observation regarding the development of immunity in mice infected with pneumococci and treated with sulfapyridine. In the limited space allowed me for my special article I did not go into any explanation for this but, as he surmises, it can be attributed to differences in technic—or rather in the strains of pneumococci employed in the two laboratories. The strains used in my laboratory are not only highly virulent but are also rapidly invasive. With our type I strain the inoculation of one or two organisms causes the death of a mouse within twenty-four hours. Dr. Whitby's strain seems almost as virulent, in that his inoculation of five organisms generally killed control mice, but the average survival time of such animals was 3.3 days. This longer survival time evidently permits Dr. Whitby to use much larger inoculums and still get survival in mice treated with large doses of sulfapyridine. These surviving

mice, having received a larger dose of antigen (pneumococci) than ours, may well be immune to homologous reinfection. The smaller inoculums of pneumococci used to infect our mice do not produce immunity in the surviving animals.

In our experience with the highly virulent and rapidly invasive strains, it has been difficult to obtain an appreciable number of surviving mice even though treatment was begun immediately after the infection and was continued intensively over a period of seven days. Out of 115 mice infected with about a thousand type I pneumococci each and treated with sulfapyridine, only seven survived, and while the life of mice infected with types II and III pneumococci and treated with the drug was prolonged, none survived. Hence in our hands sulfapyridine has been "somewhat superior" to sulfanilamide in the treatment of pneumococcal infections in mice and not "vastly" superior.

PERRIN H. LONG, M.D.,
The Johns Hopkins Hospital,
Baltimore.

FUNGUS INFECTIONS TREATED BY IONTOPHORESIS OF COPPER

To the Editor:—The article "Fungous Infections of the Hands and Feet Treated by Iontophoresis of Copper" by Haggard, Strauss and Greenberg, in the April 1 issue of *THE JOURNAL* interests me. May I comment regarding the evidence on which their report is based? The authors neglect to prove that the cases they cite are of fungous origin and, by inference, must consider an exact mycologic diagnosis of their cases to be unimportant. Assuming that an accurate clinical diagnosis of dermatophytosis was possible in every instance, the reader is still left in doubt as to the species of fungus responsible. A report on the treatment of pneumonia in which the signs of rapid breathing, fast pulse and fever were the only reported diagnostic signs would probably be considered somewhat archaic. It is known that there is a wide variation in the therapeutic response to medication of the superficial fungous diseases according to the species of infecting micro-organism. Many cases of acute eczematoid eruptions of the hands and feet (fungous and nonfungous) respond to conservative measures, such as intermittent baths of potassium permanganate (1:3,000), superficial roentgen therapy in fractional doses and the application of bland dusting powders. When treatment of such cases is given in this way the time for apparent cure will be found to compare favorably with the average time of more than five weeks required by the authors in their reported series. Acute dermatophytosis is often overtreated, and keratolytics or fungicides used in strong concentration may produce secondary eczematization. The authors admit that their study has not been adequately controlled. Is it not trite to inquire why they should desire to publish their observations when they are incomplete? Even a preliminary report in which they say they have demonstrated that iontophoretic administration of copper causes response in dermatophytosis of the hands and feet should contain laboratory proof of the existence of an infection, cultural determination of the species of pathogenic fungus, evidence that other treatment—such as wet soaks of potassium permanganate—would not do as well, and negative laboratory results when the patient is considered cured. The degree of positive reaction, or the presence of a negative reaction to trichophyton, would also be of value and interest. Had the selection of cases included infections due to *Trichophyton purpureum* (in which there is no likelihood of spontaneous cure), the evaluation of the specific fungicidal effect of iontophoresis of copper might have been more fairly determined. The method may be valuable, but a report such as this does not leave this reader unduly impressed with its specific fungicidal effect. Pathogenic fungi are rarely found on normal skin. This is borne out by the work of

Downing, Nye and Cousins (whose article the authors quote but could hardly have read carefully) and of other investigators. There are numerous saprophytes on normal skin, but these have no place in a discussion on dermatophytosis.

GEORGE M. LEWIS, M.D., New York.

"TRICHINOSIS"

To the Editor:—The editorial on trichinosis (*THE JOURNAL*, March 18, page 1074) by supplementing other efforts to emphasize the prevalence of trichinous infestations, will do good, making the profession more keenly aware of the possibility of this diagnosis. Since it may be interpreted as exaggerating the situation, it may do harm by delaying the control of the condition by rational methods. The industries concerned in hog raising and the marketing of pork products are now being approached by means of conferences to adopt some voluntary program of control.

The editorial fails to discriminate between minor degrees of infestation, which are to be shown post mortem only by refined techniques, and the clinical entity trichinosis. The demonstrated high incidence of trichinous invasion does argue a potential menace of large proportions, but the small number of reported cases of trichinosis furnishes an argument for those who wish to believe that most of these invasions are of little importance. The estimate in the article of "48,000,000 cases of trichinosis" may readily be interpreted by those so minded as a *reductio ad absurdum* of the argument for the existence of a serious menace. The validity of applying maximum figures to the entire country also may well be questioned.

As a minor point, which nevertheless does have a bearing on the significance of the maximum figures of Evans, the misstatement regarding technique may be cited. The press preparation method is in reality the "old method," in use for some fifty years, while the digestion-Baermann technique is relatively recent. Again, Evans's use of the combined technique is no innovation, since the determinations at the National Institute of Health were made by the combined methods. Evans's higher figures, unless indeed they are due to the examination of a greater number of skeletal muscles per case or to the error incident to a relatively small sample, would appear therefore to reflect merely a higher local incidence, from which the derivation of country-wide figures would not be justified.

Believing as I do that many clinical cases of trichinosis fail of recognition, I regard the editorial as a step in the right direction of increasing professional awareness.

L. R. THOMPSON, M.D., Washington, D. C.
Director, National Institute of Health.

"PHYSIOLOGY OF THE BRAIN STEM"

To the Editor:—In the issue of January 21, page 267, of *THE JOURNAL* I see that the review of my monograph "Beiträge zur Physiologie des Hirnstammes" (contribution to physiology of the brain stem) contains a serious error. This review ascribes to me the opinion that the dampened and interrupted direct current selectively stimulates the fibers and centers of the autonomic system. Actually, I have demonstrated, and have also so described it, that by the interrupted (pulsating) direct current with dampened potential fluctuations the stimulus thresholds of the animal and of the autonomic systems are brought nearer to each other. The incorrect statement in the review is misleading to the neurophysiologist and neurologist, and an entirely impossible point of view is ascribed to me.

PROF. DR. W. R. HESS,
Rämistrasse 69,
Zurich, Switzerland.

Director, Physiologisches Institut
der Universität Zürich.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PHYSICAL FITNESS INDEX TESTS

To the Editor:—What is considered the validity of the physical fitness index tests? In a review of recent strength-testing literature, Frederick Rand Rogers, Ph.D., made the following statement: "That physical educators will be called on more and more to increase pupils' health is revealed by each new report of conditions in the medical field. The plain fact is that physicians, nurses, public health services and hospital organizations are not now keeping abreast of the nation's health problems. Even if they were, they still would only serve 2 to 3 per cent of the population, chiefly preventing these from losing their lives before reaching nature's appointed span. Who is to care for the 30 or 40 per cent whose health is regularly below normal, and steadily slipping down the scale, if not physical educators? And what is health? . . . This is abundantly muscular power and coordination, which are measured most objectively, reliably, economically and interestingly to subjects by the simplest forms of strength tests." Is this a view which physical educators generally will accept and put into practice? A notice in the *Bulletin of the Indiana State Board of Health* for October 1938 was as follows: "Frederick Rand Rogers, director of physical education at Boston University, has written us as follows: 'This is to report that a Boston manufacturing concern, the DuWard Company of 51 Cornhill, Boston, is now experimenting with new designs for physical fitness testing instruments far superior to those now on the market, which they claim they can sell at greatly reduced prices. For example, the new back and leg dynamometer at less than \$100 (the present instrument is listed at \$200 and sold at \$160-\$180). As you know, the chief stumbling block to the use of P. F. I. tests has been the exorbitant cost of dynamometers; therefore we are overjoyed at this new development. This note is a warning; if you know of any one about to order dynamometers, have them wait for the new instruments, or at least until we have a chance to examine and recommend or disapprove them.' What do you think of this? Finally, I should like to ask what steps the family physician should take when the tests show a low status."

M.D., New York.

ANSWER:—[This question has been referred to workers in the field qualified to express opinions on the subject. The answer is based on their combined views.]

This question revolves around the validity of interpreting the degree of muscular strength as a definite reflection of physical fitness. Certainly even though a patient shows high muscular ability in a test it does not follow that his entire physical condition is definitely established. The human body is too complicated to attempt a diagnosis of physical condition by muscular strength alone; furthermore, it is quite generally conceded by students of the subject of physical fitness that performance tests are not as useful and as discriminating in the estimation of physical condition as the nonperformance tests. All strength tests are performance tests and hence require the conscientious cooperation of the examinee. In connection with the statement made by Rogers that "the capacity of an individual for work is a useful measure of his health" it may well be asked "What kind of work?" Most individuals today are not called on for great efforts of muscular power. Physical fitness after all is the ability to adjust to the environment and is related quite as much to the countless chemical and physical processes continually taking place as to the ability of muscles to do work.

The physical fitness index test, or the Rogers test, came into use during the early years of the present vogue for what is called "tests and measurements in physical education." In fact, so widely has this test spread in elementary and in secondary schools that it is being put to the following uses in Brookline, Mass.: (1) as the basis for the physical education activities program prescribed individually for every pupil, (2) as a guide to the evaluation of teaching procedures, (3) as a yardstick against which to consider academic load (the physical fitness index purports to determine not only a child's capacity for physical activity but "to a significant degree also his capacity for mental endurance"), (4) as a criterion by which the nutritional status and health habits may be judged, and (5) apparently as a check on the adequacy of the medical examination. The school physician is without laboratory facilities, including x-ray examinations, blood tests and determinations of the basal metabolism. The physician presumably therefore misses certain important conditions affecting physical fitness. The impression one gathers is that the physical fitness index is a tool of superior diagnostic value. Armed with this tool the physical educator, "cognizant of all defects," is now being a guide to the doctor, the school nurse, the classroom teacher and the parent (Hines,

Thomas H.: *A New Emphasis on Health, J. Health & Physical Education* 10:20 [Jan.] 1939). On a priori reasoning alone, the physical education profession must be considered bold indeed to presume serious diagnostic significance inherent in a test administered at the rate of "about a minute per pupil for corps of testers." No physiologist would be willing to say that physical fitness can be judged primarily on the basis of strength, when strength is measured by a battery of tests involving single, maximal efforts. Dynamometer tests are notoriously subject to profound variations from psychic causes alone. Strength, probably fluctuates moderately as all biologic functions do. What its normal limits of variation are for the Rogers strength test has never been satisfactorily studied. No valid test of physical fitness can disregard the inclusion of a direct or indirect estimate of the response of the cardiovascular respiratory system to measured work. If instead of dynamometer tests the Rogers battery measured the "staying power" of the major big muscle groups, the load, speed, duration and rate of doing work being controlled, its score would have vastly more value. A battery of tests composed of single maximal pulls on a dynamometer certainly does not indicate a child's "capacity for sustained physical activity or endurance."

The following general criticism of the whole test and measurement program prevents taking its results seriously: 1. The instruments used are meticulously calibrated. 2. The technique of the administration of the tests is carefully taught and the reliability of each operator is particularly measured. 3. The subject, however, is handled as a robot, unaffected by meals, fatigue or psychic disturbances. There is no regard for the fundamental rule that in all human research one should begin with a subject in an essentially "basal" condition and then carefully control the environment in which the tests are administered. 4. The data are subjected to involved statistical analyses and the numbers derived uncritically accepted whether there is sense behind the variables being related or not. Statistical methodology has taken the place of reason. 5. There is yet to be seen any evaluation of physical education fitness tests in a physiologic sense or any discussion of the possible mechanism whereby defects (the ven with the cancer beneath it) may be logically thought to modify physical fitness.

It may be safely concluded that current scientific opinion cannot grant that physical fitness can be deduced from one set of measurements alone or that muscular strength is either an accurate or a valuable index of physical fitness. (If it were, why is it that women at practically all ages have a longer life expectancy than men?) The skeletal muscle might be in good shape while there was difficulty impending in the smooth muscle of the viscera. Of all measurements, those of muscle might be considered the poorest. Emotional states determine their energy output in a large measure, and this is a serious objection. Devotion to one test and the advice that all others be discarded for experimental purposes when associated with advertisements for \$100 dynamometers do not lend credence to the scientific nature of the studies reported.

SPHENOPALATINE NEURALGIA AND STELLATE GANGLION

To the Editors:—What information can you give me about the stellate ganglion especially in relation to sphenopalatine neuralgia?

A. L. LANGHORST, M.D., Elgin, Ill.

ANSWER:—Sphenopalatine neuralgia was first observed clinically by Sluder in 1920. He stated that the sphenopalatine ganglion could include some cells which were sensory or afferent in function. The ganglion itself, located deep in the sphenopalatine fossa, was known to receive both preganglionic and sympathetic fibers, the preganglionic or motor fibers being components of the facial nerve, while the sympathetic fibers were derived from the plexus of the internal carotid artery. It was felt by Sluder that infection from the sinuses might invade the sphenopalatine ganglion and give rise to neuralgia. Recent anatomic studies, however, do not support the opinion that the sphenopalatine ganglion contains afferent ganglion cells or pain fibers.

The stellate ganglion, however, is formed by a fusion of the first and sometimes the second thoracic ganglion with the inferior cervical ganglion of the sympathetic trunk. This is such a long distance away anatomically from the sphenopalatine ganglion that the connections between the two, if there are any, must cover a devious pathway. There is no evidence that they have any clinical connection, although the question presented may have arisen from the fact that alcohol injection or removal of the stellate ganglion has occasionally been performed in an attempt to relieve pain in the face. It rarely occurs that facial neuralgia of unusual type persists after cutting the posterior root of the fifth cervical nerve, thus presumably denervating the

entire side of the face. It is for this type of neuralgia that the stellate ganglion has been removed in the past, in the hope that through vasomotor or secretory changes the persistent neuralgia will be relieved. The operation has not, in general, proved successful, although a few cases have been reported in which relief was obtained. It seems unlikely that this operation has been performed for relief of Sluder's neuralgia, for the neuralgia Sluder originally described is now not accepted clinically. It should be pointed out, nevertheless, that there still are certain obscure types of facial neuralgia the cause of which is not known.

PSEUDOBULBAR PALSY

To the Editor:—A woman aged 62, following a prolonged upper respiratory infection last spring, developed a hypertensive encephalopathy during the summer. This cleared up and aside from general weakness she was as well as could be expected until two months ago, when she suddenly noticed some difficulty in speech, and examination revealed a palsy of the lower part of the left side of the face. There was also dysphagia. The speech difficulty improved quickly and also the facial palsy, but in about two weeks or so it was noticed that there was a weakness on the right side of the face, the dysphagia persisting. However, after about another six weeks there was definite improvement in the dysphagia, and the right side of the face was practically normal, when suddenly she again developed some difficulty in speech and there was again a weakness of the left side of the lower part of the face. The systolic tension varies between 180 and 220 and the diastolic between 100 and 110. Eyeground examination shows evidence of arteriosclerosis, and there are some old small hemorrhages. During the siege of the hypertensive encephalopathy she had marked pain in the lower part of the back and lower extremities and the latter were tender. About two months ago when the first attack of facial palsy was noted she complained of a good deal of pain and tenderness in the right gluteal region. I might also add that when the right facial palsy was noted she complained somewhat later (about two weeks) of weakness in the right hand and upper extremity. This has improved. She also cannot retain urine as well as previously. She wears an upper and lower denture. How would you explain this varying picture, and what would you do?

M.D., New York.

ANSWER:—The observations submitted suggest a syndrome of pseudobulbar palsy. This is usually due to bilateral small hemorrhages or thrombi in either hemisphere of the brain secondary to cerebral arteriosclerosis and hypertension. These lesions involve both the right and left pyramidal tracts in the brain, producing bulbar symptoms by loss of voluntary innervation and not by actual paralysis. Any good textbook in neurology should be consulted for a detailed description of the clinical symptoms. The prognosis is usually unfavorable. The condition may last for years and the symptoms may even disappear for a time. The treatment is entirely symptomatic, depending on the underlying condition (arteriosclerosis and hypertension). Because swallowing is difficult, care in feeding is generally necessary.

HYPERTENSION AND MENOPAUSE

To the Editor:—A woman aged 45, in the menopause, has a hypertension varying from 160 to 200 systolic. All other causes of hypertension have been eliminated; there are no foci of infection, nephritis or arteriosclerosis. In similar cases I have used theelin in oil with excellent results. I tried to use it in this case but her symptoms were aggravated: dizziness, nervousness and pressure. What type of treatment would be indicated?

M.D., Missouri.

ANSWER:—The information given is so meager that it is almost impossible to discuss the therapy adequately. Each instance of hypertensive arterial disease presents a new and different therapeutic problem. It is vitally important to know, for example, the level of the diastolic tension and whether or not it is fixed or variable. One is doubtful also as regards the proof that "there is no nephritis," for the mere absence of proteinuria is often erroneously taken as a criterion of normal kidneys. Thorough study of the renal function is necessary before one can say with certainty that renal functional impairment does not exist. The relative youth of the patient and the variability of the systolic tension suggest an endocrine factor in the etiology of this instance of hypertensive arterial disease but by no means prove it; additional data might well demonstrate an aortic regurgitation as a cause of the systolic hypertension.

Before advising the institution of any therapy, one must urge that additional diagnostic information be acquired. Sources of psychic turmoil must be carefully sought for and judiciously analyzed; anxiety, fear, discouragement and the like are significant factors and, if present, the prolonged use of mild sedation (such as with sodium bromide 0.6 Gm., or 10 grains, thrice daily) is indicated. Of first importance is a determination of the basal metabolic rate; thyroid disturbances are very common at the age of this patient and are often misleadingly masked. In such instances the major rise is in the systolic tension. As

mentioned, renal function studies are also desirable and careful blood studies, for anemia is a not uncommon, although most frequently ignored, provoking etiologic factor in hypertension. Should the basal metabolic rate be elevated and/or anemia exist, the therapeutic indications become clear: the correction of these abnormalities. Should these tests yield evidence of normal conditions, endocrine therapy is worthy of trial. The gonadotropic extract from pregnancy urine, antophysin (Winthrop), follutein (Squibb), A. P. L. (Ayerst) or antuitrin-S (Parke, Davis) may be of value. Of greater importance, however, is the general dietary and hygienic management, which must include an adequately liberal fluid intake, a balanced diet and avoidance of excesses of condiments and spices. Proteins should not be radically restricted, for the problem is not to treat the disease but to treat the patient who has the disease, and prolonged restriction of protein intake depletes the body's resistance to infection and aggravates any tendency to anemia. Sufficient rest, calm reassurance and wise understanding and advice regarding the petty annoyances of existence can do much toward combating the psychic turbulence so characteristic of the "stormy menopause." Mild vascular sedatives of fairly prolonged action, such as sodium nitrite, erythroltetranitrate and bismuth subnitrate are worthy of trial. Sodium thiocyanate is too toxic to be used unless the patient is under exceptionally close control and frequent observations of the blood thiocyanate level are made.

THE "RADIONICS" HOAX

To the Editor:—Has there been any scientific research to determine the usefulness of Radionics in the diagnosis and treatment of disease?

M.D., California.

ANSWER:—"Radionics" is an outgrowth of the infamous Abrams quackery devices known as the "Oscilloclast," the "Electro-Concusser," the "Biodynamometer" and the "Sphygmobiometer." There is no evidence to indicate that any scientific investigation has ever been made of these devices. Indeed, there would seem to be no reason for making such a study. It is interesting to note that the editor of the *California State Journal of Medicine* and a member of the publication committee of the Medical Society of the State of California proposed a test of the Abrams device to Dr. Abrams. He refused flatfootedly in any way to cooperate in such an investigation (*THE JOURNAL*, June 10, 1922).

In some of the advertising for "Radionics," it is stated to be "the science of detecting and locating diseases by a mechanical action on magnetic waves produced by the radiation of ions through an instrument especially constructed for direct application to the human body" ["Alice in Wonderland" makes amusing reading too.—Ed.]—"It being no more possible to find ulcers of the stomach if ulcers are not present than it is to get a Chicago station by turning a dial on your radio to a Detroit station." The latter is not so difficult as implied, if reference is to WJR in Detroit and WGN in Chicago.

Other advertising includes the statement that since "a famous American diagnostician has declared that over 50 per cent of diagnoses are wrong . . . 50 per cent of the 'doctoring' public are being 'doctored' for the wrong thing." Just in case this isn't fallacious enough to serve as an irrational basis for adopting this illegitimate offspring of an illegitimate offspring of medicine, it is added that "the chiropractor has been greatly aided in his analysis of a patient's condition by his ability to locate nerves, which because of interference have been unable to function normally; but even this additional advantage [provided it were true.—Ed.] has left still much to be desired [more especially a modicum of medical science.—Ed.] in obtaining positive and definite information free from the fear of contradiction."

Such problems, however, are "simple" in the eyes of the totally uninformed radionic enthusiasts, for, believe it or not, it is claimed that radionic examination will not only determine the presence of but will actually measure the intensity of "general poison, bacterial poison, inflammation, tissue degeneration, cancerous tendencies, pus and poison producing bacteria, tuberculosis, acidosis, diabetes, fibrous tissue [sic.—Ed.], cysts, ulcers, etc.," and will indicate in which organs the conditions found are primary and in which secondary.

Continuing more of the buncombe found in the advertising for radionics: "Countless examinations have proved beyond a peradventure that the catarrhal and mucous discharges from the orifices of the body (nose, throat, ears, etc.) are frequently only secondary conditions, being the channels used by the body for the elimination of poisons arising elsewhere. For instance, a case of discharge of mucus and pus from the nose, having been under various forms of treatment for four years, was found to be due to an inflamed and infected condition of the liver ["the

newer pathology"—Ed.] the source of poison in a much-treated case of 'rheumatism' was found to be in the large intestine, which, when properly cared for, resulted in a total disappearance of the rheumatic symptoms. In a case diagnosed as 'female trouble' and 'appendicitis' the gall bladder was found to be infected and inflamed. When the spinal cause of this ["chiropractic pathology"?—Ed.] had been corrected the so-called appendicitis and other troubles vanished."

Finally, it is stated that "Radionics is not a substitute for Chiropractic, but a material aid to the Chiropractor inasmuch as it is in complete harmony with Chiropractic principles. Radionics operates totally in accord with science ["ignorance of" would be more accurate than "accord with."—Ed.], and offers absolute scientific proof of the truth and sanity of the Chiropractic Philosophy [comparable to proving astrology by numerology.—Ed.] that nerve interference is a primary cause of disease."

It is noted that all of these statements are made without any references to scientific texts or any reports in the medical or other literature, or to anything. There is no reason to institute any scientific research to determine the usefulness of radionics, when it does not even pretend to be based on anything even faintly resembling scientific evidence or, more accurately, on any evidence. It is so palpably over the borderline of science and scientific medicine and in the field of pseudomedicine and quackery that it does not deserve to be glorified by being given any consideration by scientific workers.

ANTIRABIC TREATMENT

To the Editor:—Dec. 17, 1937, a man and his wife called and gave the following history: They had been bitten on the forearms by their pet dog the previous day. The dog was observed by a veterinarian until December 18, when it died. The head was examined in the laboratory; Negri bodies were present. I gave both patients twenty-one injections of antirabies serum, two a day for the first week and one a day for the second. Neither has developed symptoms of rabies. Two weeks ago the woman was scratched on the forearm by her house cat. The cat later developed diarrhea and paralysis of the hind quarters and died on February 21. The head was examined in a laboratory within two hours after death. No Negri bodies were found. Both the husband and the couple's two sons had played with the cat during this time. No marks or scratches were found on the father's or sons' bodies. Should the four members of the family receive antirabies serum? If so, should the frequency of the dosage be the same as in the previous course of treatment? Should the children receive only prophylactic treatment? If so, how many injections should be given and how frequently? The pathologist at the laboratory has inoculated a rat with the serum from the brain of the cat. If the rat should develop no symptoms of rabies or the post-mortem examination show no Negri bodies, should treatment be discontinued?

M.D., Illinois.

ANSWER.—There does not seem to be any compelling reason why the woman, the husband or the two sons should be given antirabic treatment.

POSSIBLE NEPHROSIS FROM PAINTS

To the Editor:—Have you any information on the effects of paint on the kidneys? A girl with definite nephrosis has been for a number of years a painter in a furniture factory, using both lacquers and turpentine and oil paints, always with a brush and never with a spray.

S. J. WOLFENBANN, M.D., Fort Smith, Ark.

ANSWER.—The kidneys may be involved as one aspect of many types of occupational diseases, including those which may follow exposure to turpentine, benzene, divers alcohols and other possible constituents of paint. However, the occurrence of nephrosis as the single manifestation of injury from some industrial intoxicant is unusual. In benzene poisoning nephritis may appear, but commonly this is overshadowed by other evidences of benzene injury such as anemia, leukopenia, hemorrhagic states or lowered resistance to infection. Any claim as to the occurrence of nephritis after exposure to benzene as the single and exclusive manifestation of benzene insult is open to question. The renal system may be involved in a general picture of damage through industrial agents, but rare indeed is this one system specifically damaged to the exclusion of others. Alice Hamilton, in "Industrial Poisons in the United States," quotes from the report of the British Commission on Industrial Paints as follows: "There is not sufficient ground to warrant us in accepting the view that turpentine poisoning is the cause of the leading symptoms commonly attributed to either acute or chronic lead poisoning, nor in attributing to the inhalation of fumes of turpentine and other thinners the occurrence of chronic Bright's disease." Dr. Hamilton herself does not fully accept this quoted statement and in turn says "Turpentine vapor appears able to set up acute nephritis and repeated attacks might

be expected to terminate in chronic nephritis, unless those exposed establish some sort of immunity to vapor. Of such immunity there is no clear evidence." The stand here taken is that the occurrence of nephrosis in a worker exposed to various substances entering into paint and lacquers does not in itself constitute proof that the work materials are responsible.

BISMUTH HYDRATE COMPOUND NOT CAUSE OF DEATH

To the Editor:—Recently I was called to attend an infant of 6 months who died in less than twenty-four hours after having taken three doses of bismuth hydrate compound as per the accompanying formula. The dose was one teaspoonful every two hours, the symptoms beginning within about forty minutes after the last dose. In the absence of any other reasonable cause of death I would be glad to have your opinion on this case with information as to other similar cases if any have been reported. As you are aware, this dose was relatively large, being about six times the amount specified by the company that puts out this compound, but at the same time it is generally understood that none of the ingredients are considered highly toxic. Nevertheless the symptoms from the onset until death, which occurred about twenty hours after the family noticed evidence of a collapse, the onset of which was rather sudden, included cyanosis, depressed respiration and staring eyes with dilated pupils, although the baby did not seem to be completely unconscious at the beginning. At first there was no fever, the temperature being 96 F., but within a few hours the temperature began to rise and reached 102 about fourteen hours after the onset of symptoms. At the end of approximately fifteen hours the temperature began to decline as death approached. Also at the beginning there was considerable rattling in the chest, seemingly from mucus, but under the administration of respiratory and cardiac stimulants the noise in the chest disappeared but returned later as death became apparent. There was from time to time slight vomiting, something like once each two to three hours, not excessive at any time.

HENRY B. MAY, M.D., Benavides, Texas.

Bismuth Hydrate Compound

Formula: Each fluidounce represents:	
Chloroform	2 minims (0.12 cc.)
Bismuth oxycarbonate	10 grains (0.64 Gm.)
Fluid red gum (kino eucalypti)	32 minims (2.16 cc.)
Pepsin	4 grains (0.259 Gm.)
Phenyl Salicylate	1 grain (0.064 Gm.)
Alcohol	2 per cent
Oil and aromatics	q. s.

Action and Uses: Astringent and carminative, for use in the treatment of gastrointestinal irritation and fermentation and in diarrheas of various origins.

Supply: Bismuth Hydrate Compound—Bottles 4 ounces, 16 ounces, and 1 gallon.

Administration: From one to two teaspoonfuls every half hour for six or eight doses; children 10 drops to half a teaspoonful.

ANSWER.—The amounts of each of the ingredients of the prescription which the infant received in the three teaspoonfuls given are approximately as follows: chloroform 0.05 cc., bismuth subcarbonate 0.25 Gm., fluid of red gum (kino eucalypti) 0.81 cc., pepsin 0.09 Gm., phenyl salicylate 0.024 Gm., alcohol 0.22 cc. The nature of the oil and aromatics is not stated but it is presumed that they are nontoxic in the amounts used.

Although the dose given the 6 months old infant was about six times the recommended dose, the amounts of the various ingredients were small. The small amounts of the bismuth subcarbonate and the pepsin would certainly rule them out as the cause of death. The dose of kino eucalypti is from 5 to 20 grains (0.3 to 1.2 Gm.) of the solid gum. In this case only 0.81 cc. of the solution was used. The acutely fatal dose for chloroform when swallowed is not known with certainty, but 1 ounce would be dangerous (Sollmann). The infant received slightly less than 1 minim. Phenyl salicylate under ordinary conditions passes through the stomach unchanged, being hydrolyzed in the intestine into its components, phenol 40 per cent and salicylic acid 60 per cent. However, human milk may split it into its components (Usener) and hence in nursing infants it might give rise to a gastritis if given in large enough amounts. In this case only 0.024 Gm. was given, which would give approximately 0.009 Gm. of phenol and 0.014 Gm. of salicylic acid. These quantities are too small to give rise to dangerous symptoms, much less cause death. The 4 minims of alcohol is negligible as a cause of death. In addition these drugs were not given at one dose but were distributed over a four hour interval of time. As far as can be learned there have been no similar cases reported from this mixture.

The fact that the onset of symptoms began after the administration of the prescription might point to it as a factor in the production of symptoms, but in this case, having the possibility of violent specific allergic reaction to one or more of the ingredients, it may be presumed that the mixture was not the cause of death.

RADIUM POISONING FROM WATCH DIAL PAINTING

To the Editor:—I am interested in learning the incidence of radium poisoning in watch dial painting. A woman, aged 33, married, has necrosis of the mandible and superior maxillae. The Wassermann reaction and physical examination are negative. The patient worked at dial painting until twelve years ago, when she states that she was declared to be entirely negative so far as radium poisoning was concerned.

BERNARD R. BERKOWITZ, M.D., New York.

ANSWER.—Bony destruction of the mandible and upper maxillary in a woman previously employed in dial painting work using radioactive substances at once suggests an effect and cause relationship. The presence of radioactive substances in the body may be precisely determined even at this late time since the active period of the radioactive substances ordinarily employed far exceeds twelve years. Suitable x-ray, electroscopic or Geiger counter examination is required. The procedures involved are described in the *Journal of Industrial Hygiene* 20:36 (Jan.) 1938 in an article entitled "Hazards in the Radium and Mesothorium Refining Plant at the University of Missouri." This article contains the following quoted statement:

When radium or mesothorium is carried in the blood stream or deposited in the body it is possible to detect its presence by measuring the alpha ray activity of the expired air.

The alpha ray measurements of radon in the expired air were made by having the worker blow through a drying tower and then through the ionization chamber of a calibrated electroscope until the air within the chamber had been replaced by the air from the lungs.

In New York, workers at the Columbia University College of Physicians and Surgeons are believed to be experienced in problems of this character and equipped with adequate apparatus for the performance of necessary testing. If the commoner causes of bony necrosis about the mouth can be ruled out, it becomes highly probable that precise proof can be adduced that the present condition is due to the action of radioactive substances connected with work twelve years or more ago.

A representative list of literature items bearing on this topic follows:

- Leake, J. P.: Radium Poisoning, *THE JOURNAL*, March 26, 1932, p. 1077.
Schwartz, Louis; Knowles, F. L.; Britten, R. H., and Thompson, L. R.: Health Aspects of Radium Dial Painting: I. Scope and Findings, *J. Indust. Hyg.* 15: 362 (Sept.) 1933.
Bloomfield, J. J., and Knowles, F. L.: Health Aspects of Radium Dial Painting: II. Occupational Environment, *J. Indust. Hyg.* 15: 368 (Sept.) 1933.
Ives, J. E.; Knowles, F. L., and Britten, R. H.: Health Aspects of Radium Dial Painting: III. Measurements of Radioactivity in Workers, *J. Indust. Hyg.* 15: 433 (Nov.) 1933.
Schwartz, Louis; Makepeace, F. C., and Dean, H. T.: Health Aspects of Radium Dial Painting: IV. Medical and Dental Phases, *J. Indust. Hyg.* 15: 447 (Nov.) 1933.
Castle, W. B.; Drinker, K. R., and Drinker, C. K.: Necrosis of the Jaw in Workers Employed in Applying a Luminous Paint Containing Radium, *J. Indust. Hyg.* 7: 371 (Aug.) 1925.
Evans, R. D.: Radium Poisoning: II. Quantitative Determination of Radium Content and Radium Elimination; Rate of Living Persons, *Am. J. Roentgenol.* 37: 368 (March) 1937.
Hoffman, F. L.: Radium (Mesothorium) Necrosis, *THE JOURNAL*, Sept. 25, 1925, p. 961.
Jacobsen, I. C., and Ambrosen, Johan: Measurement of the Radiation to Which Roentgen and Radium Workers Are Exposed, *Acta radiol.* 17: 252 (June) 1936.
McMahon, M. M.: Luminous Paint Poisoning, New York State Dept. of Labor, *Indust. Bull.* 16: 291 (July) 1937.
Martland, H. S.: Occupational Poisoning in Manufacture of Luminous Watch Dials, *THE JOURNAL*, Feb. 9, 1929, p. 466; Feb. 16, 1929, p. 552.
Martland, H. S.: The Occurrence of Malignancy in Radioactive Persons: A General Review of Data Gathered in the Study of the Radium Dial Painters, *Am. J. Cancer* 15: 2435 (Oct.) 1931.
Martland, H. S., and Humphries, R. E.: Osteogenic Sarcoma in Dial Painters Using Luminous Paint, *Arch. Path.* 7: 406 (March) 1929; *THE JOURNAL*, May 11, 1929, p. 1631.
Rud, E.: Blood Examination of the Personnel of Roentgen and Radium Institutes, *München. med. Wchnschr.* 71: 1552 (Oct. 31) 1924.
Radium Poisoning, *U. S. Month. Labor Review* 28: 1209 (June) 1929.

POTASSIUM SALTS IN DIABETES MELLITUS

To the Editor:—I understand that some work has been done on the potassium alterations in diabetes mellitus. Can you enlighten me on this subject, mentioning references?
M.D., New York.

ANSWER.—Rathery and Bertoliatti (*Compt. rend. Soc. de biol.* 117:875 [Dec. 1] 1934) reported that in patients with uncomplicated diabetes the potassium content of the plasma was usually normal. In some cases in which the condition was advanced the value was increased. A detailed study of the electrolyte balance in diabetic acidosis is given in the paper by Atchley and his co-workers (*J. Clin. Investigation* 12:297 [March] 1933).

Peters and Van Slyke (*Quantitative Clinical Chemistry*, Baltimore, Williams & Wilkins Company, 1935, vol. I, Interpretations, pp. 787, 1054) mention that whereas the edema of malnourished individuals with severe diabetes is aggravated by

the giving of sodium chloride or sodium bicarbonate it may be relieved by potassium salts. For a further discussion the reader is referred to this textbook.

Kerr (*J. Biol. Chem.* 78:35 [June] 1928) found that whereas the potassium content of the blood serum of depancreatized dogs was essentially the same as that of normal animals, following a dose of insulin large enough to produce well marked hypoglycemia there was a definite fall in the potassium level. Kerr states that the potassium content of the erythrocytes is, however, not affected by overdosage with insulin and concludes that the potassium which disappears from the serum after insulin does not enter the corpuscles.

McQuarrie, Thompson and Anderson (*J. Nutrition* 11:77 [Jan.] 1936) in studies on diabetic children found that potassium chloride when given in doses of from 10 to 20 Gm. daily together with a simple diet low in sodium caused a slight fall in the blood pressure and a significant increase in glycosuria. These effects were exactly opposite to those which resulted from the administration of sodium chloride in large amounts while the patient was maintained on a diet low in potassium. A high intake of sodium chloride depressed the level of serum potassium. The observations mentioned are consistent with those of Silvette and Britton (*Proc. Soc. Exper. Biol. & Med.* 37:252 [Oct.] 1937), who reported that the administration of subtoxic doses of potassium to rats led to glycogenolysis and hyperglycemia.

IODINE AND COMPOUND SOLUTION OF IODINE IN DISINFECTION OF THE SKIN

To the Editor:—1. If a bandage on a finger is completely saturated with tincture of iodine, will it endanger the life of the finger? Is necrosis likely to occur? If so, in what time? Note the following quotation from a clipping. If the statement made in it had been regarding a 5 per cent or even a 2 per cent solution of phenol it would be credible to me, but I doubt the statement regarding tincture of iodine: "The writer recalls a sad case of mistaken zeal with respect to antiseptics when he was a medical student. A maid working for a doctor's wife cut her finger. The wife, knowing medicine by marriage, bound up the finger and, taking no chances, soaked the dressing with tincture of iodine. When the bandage was removed, the finger was literally dead and had to be duly buried." 2. Is one part of compound solution of iodine in 63 parts of water an efficient disinfectant? See following quotation from a clipping: "To summarize: A good antiseptic for the medicine cabinet can be assured by getting an ounce or two of Lugol's solution (which had better have a poison label), and a four ounce bottle. Put a half teaspoonful of Lugol's solution into the empty bottle and fill it with tap water. This gives you an antiseptic which, according to approved tests, is as powerful as mercuriolate, as cheap as milk, practically stainless and odorless, and so nontoxic that any amount a little child might drink from the bottle of the dilution would in all probability do no harm. What more do you want?"

M.D., Washington.

ANSWER.—1. To bind up a finger and then saturate the dressings with tincture of iodine is so extraordinary a procedure that little can be found reported in the literature to indicate what the result would be. Similar treatment does not cause necrosis of the foot of a small laboratory animal, however. On theoretical grounds it does not appear likely that a finger would, under such circumstances, suffer any more than intense staining, with subsequent loss of more or less skin, even though full strength iodine solution had been used. Tincture of iodine evaporates rapidly, leaving a deposit of dry iodine on the skin which penetrates the local tissues slowly and is absorbed by the body and excreted in the form of iodides (Nyiri, William, and Jannitti, Marie: About the Fate of Free Iodine upon Application to the Unbroken Animal Skin: An Experimental Study, *J. Pharmacol. & Exper. Therap.* 45:85 [May] 1932). Moreover, as soon as iodine reaches the deeper layers of skin it becomes extremely painful, differing in this respect from the phenol group of disinfectants, which produce anesthesia as they advance. Hence, in the case described, it is not probable that the patient would have left the dressing in place if the iodine had penetrated far enough to damage the deeper structures of the finger.

2. A solution prepared in the manner described would contain approximately 0.083 per cent of iodine and 0.167 per cent of potassium iodide in water. Such a solution could not be expected to reduce, by any significant amount, the number of bacteria which are ordinarily present on the skin. If, however, even weak solutions of iodine are subjected to the commonly employed in vitro tests of germicidal power or to ordinary rubbing and scraping tests for disinfection of the skin, they may, unless carefully controlled by an effective neutralizing agent for iodine, give negative and therefore misleading results, owing to the inevitable carrying over of traces of the strongly bacteriostatic iodine into cultures. Despite the claims cited, therefore, this dilute preparation of compound solution of iodine cannot be considered an efficient skin disinfectant.

QUERIES AND MINOR NOTES.

JOUR. A. M. A.
MAY 6, 1937

PARALYZED URINARY BLADDER AND CYSTITIS

To the Editor—A woman aged 38 fell from a horse ten years ago, sustaining a fractured lumbar spine with resultant paralysis of some leg muscles and the urinary bladder. She has had good orthopedic care and can walk with the aid of a cane and a steel brace on the right leg. The problem is this: The bladder can be emptied only by pressure above the symphysis, which she manages. This means a chronic cystitis. This has gone on for ten years. Since she moved to this community two years ago I have kept her quite comfortable and the bladder quite clean by a thorough weekly irrigation of the bladder at my office and an instillation of 5 per cent mild protein silver. She was recently in St. Louis on a visit and was taken to a physician (a urologist) for her weekly irrigation. After the treatment he advised her to take mandelic acid for a few days every week or so in order to keep her urine more nearly normal. I had talked this over with her at previous times but had advised her against taking any urinary antiseptic which would cause sufficient renal irritation to bring down red blood cells in the urine. I am perfectly willing for her to take mandelic acid if it is not liable to cause nephritis in time. I am not writing to ask who is right but what to do. The urine can be completely sterilized but in a short time will be back where we started because the bladder cannot be completely emptied each time. She is remarkably well and free from urinary distress if she has a weekly irrigation with boric acid solution. Is the amount of infection which must be present (pus or twenty per high power field, but the urine is always clear) apt in time to do more damage to the organism than periodic dosage with mandelic acid with consequent periodic (though mild) renal irritation? Is mandelic acid too new for this question to be answered?

M.D., Michigan.

ANSWER—The program carried out is a good one and should not be changed in any way. Mandelic acid, while not apt to cause nephritis, would probably not be recommended in this case. It might upset the stomach. The reason the infection in the urine recurs regularly after the urine has been sterilized is that the patient has residual urine. It is possible that a presacral neurectomy is indicated in this case. It might be well to have a good neurologist examine the patient and discuss the possibility of this procedure. Finally, one might discuss the possibility of suprapubic cystostomy and establish a permanent drainage if presacral neurectomy is not indicated. Although this will prevent possible recurrence of bladder infection, it is a nuisance to walk around with permanent suprapubic drainage and should be done only as a last resort.

EPHEDRINE SULFATE FOR ENURESIS

To the Editor—A girl, aged 8 years, has enuresis. Quite recently her mother told me of reading about a new treatment for this condition and she was under the impression that it was in Dr. Bundesen's column. Can you tell me whether there is such a treatment and where I can find it, if so?

JOHN R. PHILLIPS, M.D., Michigan City, Ind.

ANSWER—The treatment referred to is the use of ephedrine sulfate. The method is described in the Sept. 11, 1937, issue of the *Lancet*. The treatment is based on the observation that, in the therapy of asthma with ephedrine, periods of anuria occurred. The amount of ephedrine is greater than that of the usual therapeutic dose. The experiments were carried out by Dr. R. W. Brookfield.

GLOBULIN DETERMINATION OF SPINAL FLUID

To the Editor—What are the practical methods of globulin determination of the spinal fluid for office procedure? As the junior scopometer is no longer available, what other instruments may be used for globulin determination of the spinal fluid and where may they be obtained?

A. J. REICH, M.D., New York.

ANSWER—Probably the simplest and most practical method of estimating the globulin of cerebrospinal fluid is that described by Matz and Novick (*J. Lab. & Clin. Med.* 15:370 [Jan.] 1930) under the title "Improved Colorimetric Procedures for the Quantitative Estimation of the Proteins of the Cerebrospinal Fluid." This is a slight modification of procedures described by Wu (*J. Biol. Chem.* 51:33 [March] 1922), Ling (*ibid.* 69:397 [Aug.] 1926) and Wu and Ling (*Chinese J. Physiol.* 1:161 [April] 1927). The method "Clinical Determination of the Albumin Globulin Ratio in Spinal Fluid" by Exton and Rose (*THE JOURNAL*, Jan. 3, 1931, p. 36), in which the junior scopometer is employed, could probably be used with other procedure employed by Matz and Novick requires a centrifuge and a colorimeter, instruments which should be available in every clinical laboratory. Either a Klett biocolorimeter or a B. & L. biologic colorimeter is satisfactory. Most American authorities (Merritt and Fremont-Smith: *The Cerebrospinal Fluid*, Philadelphia, W. B. Saunders Company, 1937, p. 33) seem to feel that the determination of the protein fractions in spinal fluid, in addition to the total protein, is of

insufficient clinical value to justify the work involved. The simplest satisfactory method for total protein is the Denis method modified by Ayer, Dailey and Fremont-Smith (*Am. Neurol. & Psychiat.* 26:1038 [Nov.] 1931). Extensive studies in which the protein fractions have been determined, have been made (Kafka: *Die Zerebrospinalflussigkeit*, Leipzig and Vienna, 1930). The paper of Matz and Novick reports a large number of observations on albumin, globulin, total protein and the albumin-globulin ratio, chiefly in various forms of syphilis.

ACTION OF SNUFF ON NOSE

To the Editor—If pulverized tobacco snuff is a mucous membrane irritant when drawn by inhalation into the nasal passages, how can it produce better breathing for having used it? Your help in solving what appears to be an incongruous situation, irritants producing congestion better breathing, will be greatly appreciated.

M.D., Louisiana.

ANSWER—Snuff is a primary irritant and causes a burning feeling when first inhaled. Later on, as the habit is formed, the burning feeling is replaced by a sense of exhilaration. When the snuff is inhaled there results, as with the inhalation of all irritating materials, an excess flow of mucus and serum, which is followed immediately by sneezing and blowing of the nose, thus clearing the passages. This explains the fact that there is more breathing space after using such an irritant. However, there are three dangers in the use of snuff. In addition, polyps seem to occur rather frequently in users of snuff, and because of the excess of sneezing and blowing there is a distinct liability to infection of the sinuses.

ORGANIC DISEASE OR HYSTERIA FROM LIGHTNING

To the Editor—A middle aged woman was sitting near a window in a shoe shop working on her machine when lightning struck, resulting in some fire damage to the building. When this occurred the patient had convulsive seizures, became unconscious and was taken to the hospital in an ambulance. This condition persisted for more than twenty-four hours and when consciousness was regained the patient complained of severe headache particularly on the left side, pain and deafness of the left ear and loss of vision on the left side. Also at the slightest noise she would begin to shake and tremble. Since this incident, which happened seven months ago, the patient has had a draining left ear, there is practically no sight in the left eye and she is still complaining of nervousness and headache. All the various laboratory tests, including Kahn, Kline and Hirt tests and urine and blood counts, have been negative. A spinal tap has been done. In your opinion is this a traumatic or fright neurosis superimposed by hysteria or is it possible that the lightning did strike a person without leaving any sign of a burn? Is it possible for lightning to strike a person without leaving any sign of burns at the site of entrance? What is your opinion as to further treatment and as to prognosis? A complete ophthalmologist examined the eye and found the optic disk normal.

M.D., Maine.

ANSWER—It is rash to offer an opinion on such a case without out examination. However, the account suggests fright-neurosis with conversion hysteria, rather than a condition resulting from a structural lesion.

For purposes of diagnosis of hysteria a normal appearing optic disk would be the condition of the pupils. Obliteration or serious reduction of light or convergence reflexes in the pupil would of course be strong evidence in favor of organic disease. It is most unlikely that complete blindness of an eye sustained by lightning of organic nature could exist with normal pupillary reflexes. If the diagnosis of hysterical blindness and deafness is correct the treatment is one of suggestion, i. e. succeeding in persuading the patient that blindness and deafness are not really existing. This is a matter of personal power on the part of the physician.

PROSTATIC STONES

To the Editor—Please discuss the treatment for prostatic calculi in a man of 47. The stones have not caused symptoms. They are located deep in the gland to be removed through endoscopy. One of the stones is about the size of a hazelnut and the others about two-thirds that size. Is removal by surgical intervention, that is, suprapubic cystostomy, advisable in the absence of symptoms?

M.D., Arkansas.

ANSWER—The general consensus among urologists is that the mere presence of stones in the prostate is no indication for their removal. If the stone or stones do produce symptoms, they may be removed. This may be accomplished by (1) removal of the stones by means of the resectoscope—removal of the overlying prostatic tissue and washing the stones out of the prostatic bed, or milking them into the bladder and then evacuating them through the sheath of the resectoscope, (2) perineal prostatotomy or (3) suprapubic cystostomy.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in *THE JOURNAL*, April 29, page 1754.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical writers having five or more candidates desiring to take the examination, June 1921 and Sept. 11-13. Ex. Sec., Mr. Everett S. Elwood, 225 South Street, Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY. An Affiliate of the American Board of Surgery. Oral examinations for all candidates, St. Louis, May 14. *Written* Various places throughout the United States, Sept. 9. Applications must be filed by July 11. *Oral* Part II Philadelphia, Oct. 15. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Philadelphia, Oct. 30. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE *Written* Various sections of the United States, Oct. 16 and Feb. 19. Formal application must be received before Aug. 20 for the Oct. examination and on or before Jan. 1 for the Feb. examination. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY General oral, clinical and pathological examinations for all candidates, Part II examinations (Groups A and B) will be held in St. Louis, May 15-16. Sec., Dr. Rufus Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY *Written* Various cities throughout the country, Aug. 5. *Oral* St. Louis, May 15 and Chicago, Oct. 7. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St. Louis, May 15. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY St. Louis, May 12-13 and Chicago, Oct. 6-7. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS Cincinnati, Nov. 15. Appointments must be made before July 15. Sec., Dr. C. A. Aldrich, 723 Elm St., Cincinnati, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY Chicago, May 13. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY St. Louis, May 11-14. Sec., Dr. Cyril R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY Part II New York, May 8 and May 9. Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

AMERICAN BOARD OF UROLOGY White Sulphur Springs, W. Va., May 26-28. Sec., Dr. Gilbert J. Thomas, 1009 Nicolet Ave., Minneapolis.

District of Columbia January Report

Dr. George C. Ruhland, secretary, Commission on Licensure, reports the written examination held in Washington, Jan. 9-10, 1939. The examination covered nine subjects and included sixty questions. An average of 75 per cent was required to pass. Twelve candidates were examined, all of whom passed. Eleven physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad	Per Cent
George Washington University School of Medicine	(1936) 83.5, 85, (1937) 79.5, 82.3, 83.2	(1934)	81.1
Georgetown University School of Medicine	(1937)	(1937)	80.5
Howard University College of Medicine	(1935) 79.1, (1937)	(1937)	75.1
School of Medicine of the Division of Biological Sciences	(1935)	(1935)	81.5
Lahnemann Medical College and Hospital of Philadelphia	(1937)	(1937)	82.7
Jefferson Medical College of Philadelphia	(1937)	(1937)	81.1

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad of
George Washington University School of Medicine	(1936), (1937), 4 N. B. M. Ex.	(1936)
Georgetown University School of Medicine	(1935), (1937), 2 N. B. M. Ex.	(1935), (1937)
Howard University College of Medicine	(1932) N. B. M. Ex.	(1932)
Duquesne College Medical School	(1936) N. B. M. Ex.	(1936)
Cornell University Medical College	(1937) N. B. M. Ex.	(1937)

Minnesota January Report

Dr. Julian F. Du Bois, secretary, Minnesota State Board of Medical Examiners, reports the oral, written and practical examination held at Minneapolis, Jan. 17-19, 1939. The examination covered twelve subjects and included sixty questions. An average of 75 per cent was required to pass. Forty candidates were examined, thirty-nine of whom passed and one failed. Six physicians were licensed by reciprocity and four physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Emory University School of Medicine	(1934)	(1934)	85.6
Northwestern University Medical School	(1936) 83.2, (1937)	(1936)	88.2
Rush Medical College	(1938)	(1938)	87.3
University of Illinois College of Medicine	(1937)	(1937)	93
Indiana University School of Medicine	(1936)	(1936)	86.3
Johns Hopkins University School of Medicine	(1935)	(1935)	83.1

University of Michigan Medical School	(1930)	84.6
University of Minnesota Medical School	(1935)	86.3
(1936) 92.2, (1937) 90.3, (1938) 82.6,* 83,* 83.1,* 84.3,* 85,* 85.2,* 85.5,* 86.2,* 86.5,* 86.6, 87.1, 87.4, 87.5, 87.6,* 87.6,* 88.1,* 88.1, 88.3, 91.2		
Ohio State University College of Medicine	(1938)	83.6
University of Oregon Medical School	(1937)	93.2
Jefferson Medical College of Philadelphia	(1931)	81.3
University of Pennsylvania School of Medicine	(1935)	85.6
(1936) 90.4		
University of Texas School of Medicine	(1934)	89.2
Marquette University School of Medicine	(1938)	89.6
University of Wisconsin Medical School	(1937)	85.1

School	FAILED	Year Grad.
University of Toronto Faculty of Medicine		1916

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School	(1925)	(1925)	Michigan, (1933) Wisconsin
Rush Medical College	(1936)	(1936)	W. Virginia
University of Pennsylvania School of Medicine	(1936)	(1936)	N. Carolina
University of Virginia Department of Medicine	(1931)	(1931)	Virginia
University of Wisconsin Medical School	(1935)	(1935)	Virginia

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad. of
Northwestern University Medical School... ..	(1938)	N. B. M. Ex
Cornell University Medical College.. .. .	(1935), 2	N. B. M. Ex
University of Edinburgh Faculty of Medicine ..	(1933)	N. B. M. Ex

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Book Notices

Silicosis and Asbestosis. By Various Authors. Edited by A. J. Lanza, M.D., Assistant Medical Director, Metropolitan Life Insurance Company. Cloth. Price, \$4.25. Pp. 439, with 59 illustrations. New York, Toronto & London: Oxford University Press, 1938.

For the past ten years this country has seen marked scientific interest in the dusty lung diseases. This has led to numerous publications, trials, conflicting testimony, legislative enactments, theories and alleged palliatives. Slowly there emerge the significant facts. This book is a record of the accrued substantial observations made with regard to the two chief dusty lung diseases, silicosis and asbestosis. Its able editor, rather than author, Dr. Lanza, participated in the first well planned investigation of silicosis in this country near the year 1915, carrying out activities in the tristate lead and zinc mining district in the vicinity of Joplin, Mo. Other contributors are Drs. Sayers, Prendergrass, Gloyne, Gardner and Middleton. All have participated extensively in many investigations of dusty lung diseases. They discuss the history of silicosis and asbestosis, clinical aspects, x-ray diagnosis, chemical and experimental pathology, preventive measures, legislation, public health and economic aspects. While all sections are meritorious, the lengthy chapter on x-ray diagnosis is especially well presented. During the turmoil centering about dusty lung diseases for the past ten years it has been necessary often to make apologies for the medical profession for lack of familiarity with silicosis and later with asbestosis. Now the lament can no longer be made that in the English language there is no reliable comprehensive medical presentation on dusty lung diseases.

The printing is not as good as the contents. Several pages intended to be printed are left blank. Some lack of uniformity in the arrangement of the sections exists. Spacing, such as that in the table of contents, is poorly arranged. The repetition of the various titles of the authors in each chapter heading is superfluous. In general the contents reflect to a high degree the art and science of medicine, but the make-up is not an equally good example of the art of printing.

La fluorescence en biochimie. Par Ch. Dhérif, professeur de physiologie à l'Université de Fribourg (Suisse). Paper. Price, 80 francs. Pp. 318, with 108 illustrations. Paris: Les Presses Universitaires de France, 1937.

The first three chapters give a fairly inclusive treatment of the fundamental principles of fluorescence, of its demonstration and of the apparatus and methods for recording and measuring it. A brief chapter covers the fluorescence of carbohydrates and glucosides as well as the changes in fluorescence in the treatment of simple carbohydrates with the common reagents such as bases, acids and furfural indicators. Chapter V briefly covers pure

Thalassa: A Theory of Genitality. By Sándor Ferenczi, M.D. Authorized translation from the original German version entitled *Versuch einer Genitaltheorie*, by Henry Alden Bunker, M.D. Cloth. Price, \$1.75. Pp. 110. Albany, New York: The Psychoanalytic Quarterly, Inc., 1938.

The German volume from which this book was translated was published in 1923 but was conceived and written between 1914 and 1919, during the war, in the author's leisure time. It is important to stress the time element, since it dates the expressed ideas to a period of psychoanalytic development which, in the short life of that science, was decidedly early. The work is a product of a time when psychoanalysis was concerned with metapsychologic speculations and was far removed from biology and medicine. The author has attempted to base his theory of genitality on biologic data and phylogenetic concepts by analogy, and his speculations are highly provocative. The work is an extremely interesting and fascinating speculation but indicates the need for development of a method other than that of analogy to link biology and psychology. The fundamental premise is a Lamarckian concept of evolution on which telocologic bases of evolution interpreted from psychology rest. Biologists should by all means be acquainted with this book.

Internal Medicine in Dental Practice. By Bernard I. Comroe, A.B., M.D., F.A.C.P., Instructor in Medicine, Schools of Medicine and Dentistry in the University of Pennsylvania, Philadelphia, Leon H. Collins, Jr., A.B., M.D., F.A.C.P., Associate in Medicine in the University of Pennsylvania School of Medicine, Philadelphia, and Martin P. Crane, B.S., M.D., Instructor in Medicine in the Schools of Medicine and Dentistry of the University of Pennsylvania, Philadelphia. Cloth. Price, \$4. Pp. 352, with 45 illustrations. Philadelphia: Lea & Febiger, 1938.

This book has been written primarily for dentists and dental students, presenting the necessity of close collaboration between dentist and internist, as stated in the introduction: "Dentists frequently are afforded the opportunity of observing manifestations of systemic disease in individuals before these patients seek medical aid." There seems to be an underlying motive to interest the dentist in public relations work for the physician with a hope that the general public may come to appreciate a necessity of frequent physical examinations. There is little or no reference to the help a physician might be to a patient by observing foci of infection in the mouth and directing the patient to have dental attention. The text is written in clear, concise and convincing style, treating systemic diseases in twelve parts. Each part has a well planned medical summary describing specific diseases and their manifestations in the oral cavity. In each part adequate references are listed, so that more detailed information may be obtained if desired. This book should be of real value to dental schools as an accessory textbook.

Die Therapie der Thrombose. Von Dr. Ernst Friedländer. Paper. Price, 5.40 marks. Pp. 117, with 27 illustrations. Leipzig & Vienna: Franz Deuticke, 1938.

The author reviews the anatomic and pathologic aspects of thrombosis. He concurs in the view that emboli are derived from fresh thrombi and that those which occur in the third week following venous thrombosis result from newly formed thrombi. While he has established anatomic considerations well, certain physiologic conclusions lack the necessary evidence, for example that the femoral vein may be empty in a bedridden patient. The fact that in the prone position the blood travels in the femoral vein up a 34 per cent grade is important in the genesis of thrombophlebitis. The etiology of venous thrombosis is extensively reviewed but no new contributions are made. The author's main objectives in the management of thrombophlebitis are fixation of the thrombus and restoration of circulation. He believes that ambulatory patients with phlebitis should remain ambulatory and that patients confined to bed when phlebitis occurs should be put through a series of positions and graduated exercises. He believes that his method of treatment reduces the incidence of pulmonary embolism but it is to be regretted that there is not good proof of this. He stresses the danger of pulmonary embolism after thrombophlebitis, yet it has been emphasized in the American literature that embolism seldom follows phlebitis. A recent article states that thrombophlebitis was recognized clinically in only five of 116 consecutive cases of fatal postoperative pulmonary embolism. It is doubtful that the complicated exercises outlined are necessary, for patients

appear to convalesce satisfactorily from phlebitis if they remain in bed with the involved leg elevated and warmed by moist packs until the tenderness over the inflamed vein has disappeared, the oral temperature has returned to normal and the edema has disappeared. The author states that with his method of treatment the average period of disability has been reduced from seventy-six to six days. The former figure is considered archaic in this country, since most patients become ambulant from eighteen to fourteen days after the onset of phlebitis when given much simpler treatment than that outlined. If one considers the mental and physical comfort of the patient in addition, the value of the author's management remains doubtful. The monograph suffers from repetition and theorization. Its chief value is in reviewing the subject of thrombosis and reemphasizing that it is not necessary to keep patients with thrombophlebitis in bed for long periods.

Synopsis of Clinical Laboratory Methods. By W. E. Bray, B.A., M.D., Professor of Clinical Pathology, University of Virginia, Charlottesville. Second edition. Fabrikoid. Price, \$4.50. Pp. 408, with 68 illustrations, including 17 color plates. St. Louis: C. V. Mosby Company, 1938.

Two years ago the first edition of this excellent synopsis appeared. It had 324 pages, contained descriptions of the most frequently used laboratory tests and was well liked by physicians and technicians. In the second edition it has been enlarged but the arrangement of the chapters has remained the same. More attention has been given to the clinical significance of laboratory observations. The descriptions of the various procedures are brief but adequate. The black and white illustrations have been increased from thirty-two to fifty-one and the color plates from eleven to seventeen. Additional methods described include the determination of serum phosphatase, titration of staphylococcus antitoxin, use of the peroxidase Giesma stain, cough plate method for the diagnosis of whooping cough, vitamin C titration, test for cyanates in the blood, determination of sulfanilamide in the blood and differential heterophil agglutination for infectious mononucleosis. There are chapters on poisons and foreign substances and on surgical pathology and one listing indicators, stains and reagents. This manual is one of the best small books on laboratory diagnosis.

Nogle Undersøgelser over Nyrifunktionen ved Epilepsi. Af Alf. Yde. [Studies on Renal Function in Epilepsy.] Denne Afhandling er af det lægevidenskabelige Fakultet antaget til offentlig at forsvares for den medicinske Doktorgrad, København. Paper. Pp. 136. Copenhagen: NYT Nordisk Forlag, Arnold Busek, 1937.

This is a doctorate thesis based on extensive personal investigations of every phase of renal function in epileptic subjects observed in the university psychiatric clinic of Copenhagen and the epileptic colony "Filadelfia." Among the conclusions are that there is no definite relationship between diuresis and the epileptic attack. The author has been unable to confirm the hypothesis of pre-epileptic oliguria and post-epileptic polyuria. The urea clearance rises above the normal upper limit for some hours before an attack and falls suddenly after the attack. It is suggested that the pre-epileptic rise may be caused by central irritation brought about by a moderate increase in epinephrine, while determinations of the chlorine in the plasma and urine did not lead to its explanation. Finally, it is concluded that functional alterations in the vegetative centers in the mid-brain play a part in the precipitation of epileptic attacks.

Practical Birth-Control Methods. By Norman E. Himes, Ph.D. with the medical collaboration of Abraham Stone, M.D. Introduction by Robert L. Dickinson, M.D. Foreword by Havelock Ellis. Paper. Price, 95 cents. Pp. 254, with 29 illustrations by Irving Gels. New York: Modern Age Books, 1938.

In this book, written in a simple pleasant style, birth control and allied subjects are discussed in a comprehensive manner denoting the authors' thorough understanding of this vital problem. The medical aspects of contraception are ably presented, together with effective anatomic diagrams for instruction purposes. Common misconceptions and causes for failures of the various methods are explained clearly. The book is replete with many practical details, often neglected, which are of considerable importance in the teaching of contraception. There are a number of interesting topics other than the medical aspects which are educational: legal aspects, abortion, history of contra-

ception, sterility and other subjects are presented clearly in non-technical language. An admirable feature of the book is the discussion of the social, economic and religious backgrounds of the individual in respect to the practice of contraception. These environmental factors are intimately involved in the majority of problems, and the authors are to be complimented on the sympathetic and reasonable handling of these subjects. An informative appendix adds to the value of the book.

Les maladies de l'œsophage. Par J. Terracol, professeur à la Faculté de médecine de Montpellier. Avec la collaboration de J. Baumes et al. Cloth. Price, 220 francs. Pp. 664, with 352 illustrations. Paris: Masson & Cie, 1938.

At first thought it would seem improbable that any one could write a book of 664 pages on the esophagus alone, but actually Dr. Terracol and seventeen collaborators have done the trick. What is even more remarkable is that an examination of certain chapters, such as the one on cardiospasm, reveals that a good deal more might well have been written. In fact, the main criticism one might bring against the book is that so little is written about the treatment of cardiospasm, which is the most common disease of the esophagus. The authors seem never to have heard of the Plummer dilator, which works beautifully in most cases, and they give some space to a discussion of the old transabdominal operation, which should probably never be used. Certainly if this book goes into a second edition the authors should describe the Plummer-Vinson technic and should show the tremendous advantages of passing the dilating instrument over a thread which has previously been swallowed and allowed to pass down into the small bowel, where it is in a way anchored. Another criticism that might be directed against the book is that in places the authors might have done better to describe only the treatments which they have found useful. It only clutters up the literature to describe those which are of little if any value. These criticisms, however, should not be allowed to obscure the fact that the book contains a tremendous amount of information presented in an attractive way. Every medical library of any size should have a copy. It is well illustrated and there are some colored plates showing the esophagus as seen through the electrically lighted tube. There are good bibliographies attached to the chapters, but unfortunately there is no index.

Aids to Embryology. By Richard H. Hunter, M.D., M.Ch., Ph.D. Lecturer in Anatomy, Queen's University, Belfast. Third edition. Cloth. Price, \$1.25. Pp. 178, with 44 illustrations. Baltimore: William Wood & Company, 1938.

Here is a series of brief summaries to each of which a still briefer summary is appended. The object is to provide clear and concise statements which can be memorized and used to answer questions in examinations. In this edition discussions on heredity and the current ideas as to the endocrine regulation of the female reproductive system have been added to meet new requirements of the British Medical Council. The author hopes too that he has provided enough information so that the student can take a rational and understanding view of congenital abnormalities. It is probable that the student cannot assimilate much more embryology than this unless he can come into personal contact with some of the kaleidoscopic changes of ontogeny. Often the treatment is necessarily so inadequate as to give no ideas whatever (see coelom); there are merely some pertinent phrases which may enable the student to indicate that he has heard mention of the subject in question. Some quite unnecessary mistakes have crept in, especially in the chapter on the nervous system. In an appendix there is a discussion of fetal age, with data on the time of appearance of certain ossification centers and a list of characters which can be used to estimate the age of viable fetuses.

Vom Wesen der Neurose und von ihren Erscheinungsformen. Von Dr. Ernst Speer, Nervenarzt in Lindau (Bodensee). Paper. Price, 3.60 marks. Pp. 122, with one illustration. Leipzig: Georg Thieme, 1938.

Neuroses are never permanent states in the sense of inherited and unmodifiable characteristics but always follow disturbances in assimilating and reacting to life experiences. They are partial solutions to the experience and as such indicate the possibility within the person of a satisfactory terminal solution. Neuroses are not due to structural abnormalities of the brain, either histo-

pathologic or chemical, nor are they the results of extrapersonal demoniacal agents. The individual, furthermore, is guiltless in his illness. No neurotic consciously develops his difficulty; the neurosis develops from the unconscious. These excerpts are evidences of the dynamic concepts of the author, remarkable only because of their source. This is one of the few books that indicate a discontent with the official constitutional, racial concept of nervous disorders expressed in recent German publications. The author expresses his point of view delicately without too great detail. Concerning the early life experiences which are not successfully solved and which remain unconscious, manifesting only the partial solution in neurotic behavior, he is reticent. Nevertheless the work is a hopeful sign indicating that dynamic psychiatry in Germany is not dead but only suppressed into latency.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Compensability for Disability Following Hernia and Operative Repair.—The claimant's work required him to shovel dirt and other substances from one place to another. He alleged that on May 19, 1936, while so engaged, a hernia appeared suddenly and was immediately followed by intense pain. Previous to that time, according to his claim, he had been in sound physical condition. On June 1, he filed a claim with the industrial accident board but said nothing concerning the operation to cure the hernia that he was to submit to on the following day. The claim did not reach the board until the day after the operation, but the board was notified of the operation about July 10. After a hearing on August 12, the board held that the operation had cured the hernia and awarded compensation at the rate of \$7.20 a week for twenty-six weeks for temporary disability. The claimant alleged that he had been permanently and totally disabled and appealed to the district court, Wise County. After a jury trial, the court rendered judgment in his favor for \$2,492.48. The employer's insurance carrier thereupon appealed to the court of civil appeals of Texas, Amarillo.

The insurance carrier contended that the operation for the repair of the hernia had been successful and that the claimant was entitled to compensation for only temporary disability, under subdivision 4, section 12 b, article 8306, Revised Civil Statutes of Texas, 1925, which authorized compensation for twenty-six weeks only, after a successful operation for hernia. Clearly, however, said the court, if the operation failed to restore the appellee to his former ability to perform labor, it would not be a successful operation such as was contemplated by the statute. It was proved by ample evidence that the operation had reduced the hernia and that the complainant had completely recovered from the operation. He claimed, however, that notwithstanding the operative cure he had "a left-over condition from the injury and operation which rendered him totally incapacitated to perform labor." The question therefore, said the court, was whether or not the operation had failed to restore the appellee to his former ability to perform labor. The statute does not require an injured employee to file his claim for anything other than a hernia, and when he has received an injury to a specific member of the body he is not confined to a recovery of the compensation specially provided for such injury if he alleges and proves other injuries, or if it is fairly shown that the injury to the specific member of the body has involved other portions of the body or affected his general health.

In the claim filed by the claimant with the industrial accident board he stated that the front of the abdomen near the left groin, the site of the injury, was swollen, that he was unable to stand on his feet without intense pain and that the injury had resulted in permanent and total disability. A physician testified that he had examined the claimant and that when the claimant walked he had to do so very carefully in order to prevent pain; that he could not straighten his body very well

or hold himself in a straightened position; that the claimant was very much weakened; that the condition would last as long as he lived and that the claimant could not do anything. There was no evidence to show that the claimant's condition was due to anything other than the injury that he received May 19. It was proper, therefore, said the appellate court, for the trial court to submit to the jury the question as to whether the claimant had sustained any loss of capacity to work as the result of the injury.

The insurer complained that the trial court had refused to submit to the jury a special issue requested by it, asking the jury to find from a preponderance of the evidence that the claimant's disability would not be removed by physical exertion. The request for this special issue was based on the testimony of a medical witness to the effect that after an operation for emia a patient becomes "soft" to the extent that when he goes back to work he has considerable soreness; that if the claimant could go back to work and perform physical labor for ten days or two weeks the soreness of which he complained would entirely disappear, but as long as the claimant refrained from working and exercising the muscles and tendons in the area of the operation he would experience tenderness and the muscles and tendons would be sore. The trial court refused, however, to submit that issue. The testimony of the witness, said the appellate court, was necessarily only his opinion. The jury could not have known whether exercise would or would not remove the disability. If the jury had undertaken to answer such a special issue, their answer could have been nothing more than their opinion obtained from the testimony of the surgeon as to the probability of a future event, which would not have furnished a proper basis for a judgment in a case of this kind. If the insurer desired that the jury pass on the question presented by the requested special issue, the proper course would have been for it to request an examination of the claimant, on the theory that he was persisting in injurious practices which tended to imperil or retard his recovery. If an examination had been made under such circumstances and the evidence in respect thereto had warranted, it would have been proper for the court to submit such an issue as to whether or not the appellee was persisting in such practices. The trial court, therefore, did not err in refusing to submit to the jury the special issue requested by the insurer.

The court of civil appeals accordingly confirmed the judgment in favor of the claimant, but only on condition that he consent to a reduction of the award by \$100, the amount allowed as the physician's fee in the case. This reduction was based on the fact that the claimant had not submitted evidence in the course of the trial as to the reasonableness of that fee.—*Travelers Ins. Co. v. Mote (Texas)*, 116 S. W. (2d) 427.

Evidence: Hypothetical Question Must Be Based on Facts in Evidence.—The testimony of a physician, said the Supreme Court of South Carolina, that in his opinion the plaintiff was totally and permanently disabled can have no probative value in the face of evidence of the physical fact that the plaintiff was able, after he was alleged to be disabled, to perform the same sort of work in which he was accustomed to engage. Further, the hypothetical question propounded to an expert witness must be framed only on facts in evidence and must not include the opinion of another expert. As is said in 22 Corpus Juris 706-9:

The expert, properly so called, is asked what would be his judgment upon all or any prescribed part of the facts, as to which evidence has been lawfully received, or which has been admitted, assuming that they are true, provided that a sufficient number of facts are assumed to enable the witness to give an intelligent opinion. The witness having no facts in mind as the result of observation, it is in this way alone that a proper basis for a reasonable judgment can be furnished, and the witness cannot add to the hypothetical question facts within his own knowledge and not in evidence. The requirement that the question should be in hypothetical form, stating fact of which there is some evidence in the case, continues throughout the examination of the expert. . . . Different hypotheses may be submitted to the witness for different parties, provided the facts embraced in each hypothesis have some support in the evidence. . . . A hypothetical question which includes, with other facts, the opinion of another expert is improper.

—*Ellis v. Kansas City Life Ins. Co. (S. C.)*, 197 S. E. 398.

Society Proceedings

COMING MEETINGS

- American Medical Association, St. Louis, May 15-19. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.
- American Academy of Tuberculosis Physicians, St. Louis, May 13-14. Dr. Arnold Minning, 638 Metropolitan Bldg., Denver, Secretary.
- American Association for the Study of Gout, Cincinnati, May 22-24. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
- American Association for Traumatic Surgery, Hot Springs, Va., May 8-9. Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.
- American Association of Genito-Urinary Surgeons, Williamsburg, Va., May 24-26. Dr. Charles C. Higgins, 2050 East 93d St., Cleveland, Secretary.
- American Association of Industrial Physicians and Surgeons, Cleveland, June 5-8. Dr. V. S. Cheney, Armour and Company, Union Stock Yards, Chicago, Secretary.
- American Bronchoscopic Society, Rye, N. Y., May 26. Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.
- American College of Chest Physicians, St. Louis, May 13-14. Dr. Robert B. Homan Jr., 109 North Oregon St., El Paso, Texas, Secretary.
- American Dermatological Association, Montebello, Canada, May 31-June 3. Dr. Fred D. Weidman, University of Pennsylvania Medical Laboratories, Philadelphia, Secretary.
- American Gynecological Society, White Sulphur Springs, W. Va., May 22-24. Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.
- American Heart Association, St. Louis, May 12-13. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.
- American Laryngological Association, Rye, N. Y., May 24-26. Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.
- American Laryngological, Rhinological and Otolological Society, Chicago, May 10-11. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.
- American Neurological Association, Atlantic City, N. J., June 5-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.
- American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.
- American Orthopedic Association, Buffalo, N. Y., June 5-8. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
- American Otolological Society, New York, May 22-23. Dr. Thomas J. Harris, 104 East 40th St., New York, Secretary.
- American Proctological Society, Brooklyn, N. Y., June 25-27. Dr. Curtice Rosser, 710 Medical Arts Bldg., Dallas, Texas, Secretary.
- American Psychiatric Association, Chicago, May 8-12. Dr. Arthur H. Ruggles, Butler Hospital, Providence, R. I., Secretary.
- American Radium Society, St. Louis, May 15-16. Dr. Frederick W. O'Brien, 465 Beacon St., Boston, Secretary.
- American Rheumatism Association, St. Louis, May 15. Dr. Loring T. Swaim, 372 Marlborough St., Boston, Secretary.
- American Society for the Study of Allergy, St. Louis, May 15-16. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.
- American Society of Clinical Pathologists, St. Louis, May 12-14. Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.
- American Surgical Association, Hot Springs, Va., May 11-13. Dr. Charles G. Myster, 319 Longwood Ave., Boston, Secretary.
- American Therapeutic Society, St. Louis, May 12-13. Dr. Joseph T. Elward, 1726 Eye St. N.W., Washington, D. C., Secretary.
- American Urological Association, White Sulphur Springs, W. Va., May 29-June 1. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.
- Arkansas Medical Society, Hot Springs National Park, May 8-10. Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.
- Associated Anesthetists of the United States and Canada, St. Louis, May 15. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary General.
- Association for the Study of Internal Secretions, St. Louis, May 13-14. Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.
- Association of Military Surgeons of the United States, Washington, D. C., May 8-10. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.
- Connecticut State Medical Society, New Haven, May 25-26. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.
- Massachusetts Medical Society, Worcester, June 6-8. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.
- Medical Library Association, Newark, N. J., June 27-29. Miss Janet Doe, 2 East 103d St., New York, Secretary.
- Minnesota State Medical Association, Minneapolis, May 31-June 2. Dr. B. B. Souster, 11 West Summit Ave., St. Paul, Secretary.
- Mississippi State Medical Association, Gulfport, May 9-11. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.
- Montana Medical Association of Butte, June 28-30. Dr. Thomas L. Hawkins, 50 North Main St., Helena, Secretary.
- National Gastroenterological Association, New York, June 1-2. Dr. G. Randolph Manning, 1819 Broadway, New York, Secretary.
- National Tuberculosis Association, Boston, June 26-29. Dr. Charles J. Hatfield, 50 West 50th Street, New York, Secretary.
- New Hampshire Medical Society, Manchester, June 8-9. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.
- New Jersey Medical Society of Atlantic City, June 6-8. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.
- New Mexico Medical Society, Gallup, May 11-13. Dr. L. B. Cohenour, 219 W. Central Ave., Albuquerque, Secretary.
- North Carolina Medical Society of the State of, Cruise to Bermuda, May 9-14. Dr. T. W. M. Long, Roanoke Rapids, Secretary.
- North Dakota State Medical Association, Fargo, May 8-10. Dr. Albert W. Skelsey, 20 1/2 North Broadway, Fargo, Secretary.
- Pacific Northwest Medical Association, Spokane, Wash., June 26-29. Dr. C. W. Countryman, 407 Riverside Avenue, Spokane, Wash., Secretary.
- Pacific Coast Oto Ophthalmological Society, San Francisco, June 19-22. Dr. C. Allen Dickey, 450 Sutter St., San Francisco, Secretary.
- Rhode Island Medical Society, Providence, June 7-8. Dr. Guy W. Well-124 Waterman St., Providence, Secretary.
- Society of Surgeons of New Jersey, Elizabeth, May 25. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.
- Texas State Medical Association of, San Antonio, May 8-11. Dr. Herman Taylor, 1404 West El Paso St., Fort Worth, Secretary.
- Vancouver Medical Association Summer School, Vancouver, B. C., June 6-9. Dr. W. W. Simpson, 203 Medical Dental Bldg., Vancouver, B. C., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Ophthalmology, St. Louis

22: 119-238 (Feb.) 1939

- Histologic Study of the Eyes of Rabbits Congenitally Infected with Syphilis. H. Shiga, Tokio, Japan.—p. 119.
Late Results in Retinal Detachment Operations. D. K. Pischel, San Francisco.—p. 130.
Papillitis and Papilledema in Multiple Sclerosis. S. Sugar, Chicago.—p. 135.
Dysostosis Craniofacialis (Crouzon). A. C. Krause and D. N. Buchanan, Chicago.—p. 140.
Lectures on Motor Anomalies: VI. Principles of Surgical Treatment. A. Bielschowsky, Hanover, N. H.—p. 145.
Some Physiologic and Anatomic Aspects of the Cornea Affecting Its Pathology. T. L. Terry, Boston.—p. 153.
Monocular Protection versus Monocular Occlusion. W. H. Howard, Chicago.—p. 156.
Superficial Marginal Keratitis: Clinical and Anatomic Findings in Fellow Eyes. O. H. Ellis, St. Louis.—p. 161.
Congenital Abducens Paralysis. C. Apple, Chicago.—p. 169.

American Journal of Pathology, Boston

15: 1-154 (Jan.) 1939

- Pathologic Anatomy of Experimental Thrombopenic Purpura in the Dog. L. M. Tocantins and H. L. Stewart, Philadelphia.—p. 1.
Pathologic Changes in the Heart, Skeletal Musculature and Liver in Rabbits Treated with Insulin in Shock Dosage. J. Tannenberg, Albany, N. Y.—p. 25.
Growth Processes in Cartilage and Bone Subsequent to Gonadectomy and Administration of Anterior Pituitary Extract of Cattle in Immature Male and Female Guinea Pigs. M. Silberberg and Ruth Silberberg, St. Louis.—p. 55.
*Observations on Etiology of Ulcerative Colitis: III. Distribution of Lesions and Its Possible Significance. R. Lium and J. E. Porter, Boston.—p. 73.
Polyarteritis Nodosa: Report of Case. D. R. Weir, Boston.—p. 79.
Metastasizing Fibroleiomyoma of Uterus: Report of Case and Review of Literature. P. E. Steiner, Chicago.—p. 89.
Primary Hyperparathyroidism with Extensive Renal Calcification and Secondary Hyperplasia of the Parathyroids: Report of Case. J. W. Johnson Jr., New York.—p. 111.
Tularemia Septicemia: Report of Case. P. Kimmelstiel and H. W. Caldwell, Richmond, Va.—p. 127.
Congenital Rhabdomyoma of Heart: Report of Case. J. S. Labate, New York.—p. 137.
Method for Impregnation of Perivascular Nerves on Intracerebral Blood Vessels. S. P. Humphreys, Montreal.—p. 151.

Ulcerative Colitis.—Of six cases of ulcerative colitis that came to necropsy, Lium and Porter state that the first attack of colitis occurred in two only two months before death. Four of the patients had had previous attacks and died during an acute exacerbation of the disease. Cultures of stools and agglutination reactions for dysentery organisms of five of these patients were negative. The cultures of stools for pathogenic bacteria were repeatedly negative of one but *Bacillus enteritidis* was recovered from the blood stream at necropsy. The disease varied in its extent; one patient showed involvement of only the rectum and sigmoid, in three the lesions extended to the splenic flexure and in one to the midportion of the transverse colon, and one showed involvement of the entire colon without extension beyond the ileocecal valve. In all instances the most severe lesions were in the rectum. At the junction of the rectum and sigmoid the ulcerations developed into three rows running in the longitudinal direction of the intestine. In places the ulcerations extended between the longitudinal rows of ulcers and when this occurred they seemed to follow a linear pattern in the circular direction of the intestine. When the fat and mesenteric attachments were dissected away from the muscular layers of the intestine it was found that the lesions lay directly over the tenial bands. This correlation was found in all six cases.

The intestinal tract was unevenly involved by the disease and lesions were found in all stages of development in the same individual. The earliest gross changes observed consisted essentially of hyperemia, edema and petechial submucous hemorrhages. In certain areas in which the lesions had advanced to a later stage, superficial erosions occurred which were covered with fibrin. Other lesions were found which were interpreted as transitional stages between the earliest erosions and the frank ulcerations. Mucus in the epithelial cells was completely or almost completely absent from the early lesions. This was observed in all sections taken from the acutely involved areas and contrasted sharply with the appearance of the mucous membrane in a normal colon. The arrangement of the severest lesions in ulcerative colitis is such that they lie directly over the most powerful muscles, and there may well be a direct relation between the muscles and the lesions. The early stage of ulcerative colitis can be simulated experimentally in animals by hypermotility and spasm of the colonic muscles. Spasm and hypermotility of the intestinal muscles are a prominent clinical feature of ulcerative colitis. It seems highly probable that ulcerative colitis is primarily a disease caused by intense muscular spasm and hypermotility, and therefore the distribution of lesions follows a muscular pattern. Whatever infectious element is present may well be due to secondary involvement of the damaged areas caused by muscular overactivity.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

41: 145-304 (Feb.) 1939

- Role of Autonomous Movements of Gastrointestinal Mucous Membrane in Digestion. G. Forssell, Stockholm, Sweden.—p. 145.
Cerebral Angiography by Direct Injection of the Common Carotid Artery. F. Turnbull, Vancouver, B. C.—p. 166.
Bronchiectasis, Collapsed Lung and Triangular Basal Shadow in the Roentgenogram and Their Interrelationship. W. E. Anspach, Chicago.—p. 173.
Roentgenologic Aspect of Lung Edema. Mary Werkenthin, Warsaw, Poland.—p. 183.
Some Fresh Aspects of Appendicitis: Joint Roentgenologic and Histopathologic Study. P. F. Sahyoun and A. Oppenheimer, Beirut, Lebanon, Syria.—p. 188.
*Radiotherapy in Hodgkin's Disease (Malignant Granulomatosis): Anatomical and Clinical Foundations; Governing Principles; Results. R. Gilbert, Geneva, Switzerland.—p. 198.
Results of Iliae Lymphadenectomy with Irradiation in Borderline Cancer of the Cervix. F. J. Taussig, St. Louis.—p. 242.
Hereditary Changes in Descendants of Female Mice Exposed to Roentgen Rays. G. D. Snell, Bar Harbor, Maine, and F. B. Ames, Bangor, Maine.—p. 248.
Measurement of Supervoltage X-Rays with Free-Air Ionization Chamber. L. S. Taylor, G. Singer and A. L. Charlton, Washington, D. C.—p. 256.
Progress in the Design of Rotating Anode Tubes. M. J. Gross and Z. J. Atlee, Chicago.—p. 276.

Radiotherapy in Hodgkin's Disease.—Gilbert finds that x-ray exploration of malignant granulomatosis (Hodgkin's disease or lymphogranulomatosis) offers a valuable means of orienting clinical diagnosis, of determining the site and extent of certain deep lesions, and of verifying and following their regression after treatment or their extension after recurrence. Systematic roentgen therapy is the method of choice because, by reason of the essentially lymphoid character of its lesions, malignant granulomatosis usually has an exceptional degree of radiosensitiveness. The diagnosis should rest on a biopsy whenever possible. In this systemic disease the roentgenologist giving roentgen therapy must act as a general physician. He should know its manifestations, the regions it involves, its modes of extension, its types and evolutionary caprices, its response to roentgen therapy and the reactions of the patient during treatment. The aim of treatment is to obtain as frank and as long remissions as possible, thus restoring to the patient the illusion of recovered health and complete capacity to work. This implies the destruction of all the granulomatous foci, deep and superficial, without jeopardizing the general condition of the patient or the condition of the blood. Except in special cases, roentgen therapy is more important than radium therapy because of the extent of the area to be irradiated and because of the doses to be delivered to the deepest foci. Simple, daily, fractional irradiation should be directed to each invaded region in succession or, according to the cases, directed first to regions requiring the

earliest treatment. In this way each field is irradiated only at intervals of about two days until a sufficient total dose has been given (clinical and blood examinations). Roentgen therapy should be repeated only on the recurrence of the disease. So-called maintenance or prophylactic treatment is superfluous and even detrimental. Roentgen therapy modifies the clinical aspect of the disease and retards its evolution. Its influence is the more pronounced as the disease is less malignant; its extent and the age of the patient also are deciding factors. The average duration of survival, according to different authors, has been doubled and even tripled; the same proportion is found when long term results are analyzed.

Annals of Surgery, Philadelphia

109: 321-480 (March) 1939

- Some Recent Advances in Surgical Therapeutics. I. S. Ravdin, Philadelphia.—p. 321.
- Surgery of the Gallbladder. B. Brooks and T. E. Wyatt, Nashville, Tenn.—p. 334.
- Hepatic and Biliary Tract Disease: Review of Recent Significant Advances. F. F. Boyce, New Orleans.—p. 351.
- Large, Cavernous Hemangiomas of Liver: Report of Inoperable Case Treated with Roentgenotherapy. B. S. Ray, New York.—p. 373.
- *Carcinoma of Peripapillary Portion of the Duodenum. M. M. Lieber, Philadelphia; H. L. Stewart, Boston, and H. Lund, Uniontown, Pa.—p. 383.
- Surgical Procedures for Carcinoma of Transverse Colon. C. W. Mayo and W. C. Simpson, Rochester, Minn.—p. 430.
- Short Interval, Two Stage Thyroid Lobectomy for Hyperthyroidism. M. Taffel and S. C. Harvey, New Haven, Conn.—p. 437.
- Secondary Deformities in Cleft Palate Patients. V. H. Kazanjian, Boston.—p. 442.
- Perforated Wound of the Rectum into the Pouch of Douglas: Caused by Impalement. J. H. Powers and E. S. O'Meara, Cooperstown, N. Y.—p. 468.
- Technic for Producing Facial Masks and Models. B. S. West, Hamilton, N. Y.—p. 474.

Carcinoma of Duodenum.—Lieber and his co-workers present a clinical and pathologic review of carcinoma of the peripapillary region of the duodenum, based on seventeen new cases and 205 cases reported in the literature. Thirteen of the authors' cases and one from the literature were found in 22,152 necropsies and three in 4,154 necropsies. The average age was about 54.4 years. Eighty-three of the patients were women and 139 were men. Only thirteen cases occurred in individuals from 15 to 34 years of age. The onset was acute in about 80 and gradual in 20 per cent of the cases. The principal symptoms and signs, irrespective of the mode of onset, were jaundice, pain, loss of weight and strength, anorexia, fever, vomiting, constipation, diarrhea and a sense of weight and pressure in the abdomen. Other less common symptoms were dyspepsia, epigastric distress, flatulence, abdominal distention, nausea and chills. Jaundice was a symptom in 98.2 per cent of the cases and pain in 59.4 per cent; both were associated at the onset of the condition in 24.3 per cent. Fever, sometimes accompanied by chills, occurred in 33.3 per cent of cases, usually late in the condition. A mass was palpable clinically in the region of the primary tumor in only four cases. The liver was palpably enlarged in 77.9 per cent of cases and the gallbladder in 49.9 per cent. A moderate grade of anemia was the rule in these patients. A correct preoperative diagnosis was made in approximately 17.1 per cent of cases. The presence of a lesion in the region of the papilla of Vater was recognized roentgenographically in sixteen of sixty cases examined. At celiotomy, a correct surgical diagnosis was made in approximately 68 per cent of 122 cases. Ninety-seven of 100 patients, treated medically and not subjected to surgery, died on an average of 6.63 months after the onset of the illness. Surgical therapy was instituted in 122 cases. There was an ultimate mortality rate of 72 per cent. The operative mortality was 50.6 per cent. Of fifty-one patients subjected only to some type of palliative procedure for the relief of obstructive jaundice, the operative mortality was 78.4 per cent. Of fifty-seven patients in whom the primary growth was resected either alone or in combination with other surgical procedures, the operative mortality was 30 per cent. The patients who died immediately after an operation were ill for an average of six months before operation. Other patients who were operated on and who survived the immediate postoperative effects lived for an average of two years after the onset of the condition, and a little more than one half of these were reported

alive at the end of this period; of this group, those who died were ill for an average of seven months before operation, whereas those reported as still living were ill for an average of only two months before operation. These figures emphasize the importance of early diagnosis and early surgical treatment.

Archives of Internal Medicine, Chicago

63: 201-432 (Feb.) 1939

- Etiology of Ulcerative Colitis: I. Preparation, Care and Secretions of Colonic Explants in Dogs. R. Lium and J. Porter, Boston.—p. 201.
- Id.: II. Effect of Induced Muscular Spasm on Colonic Explants in Dogs, with Comment on Relation of Muscular Spasm to Ulcerative Colitis. R. Lium, Boston.—p. 210.
- *Abnormalities of Calcium Metabolism. F. B. Taylor, P. Michael and L. Barnard, Oakland, Calif.—p. 226.
- Renal Amyloidosis: Further Study of Clinical Course and Pathologic Lesions in Fifty-Seven Cases. H. O. Altmow, Minneapolis; Charlotte C. Van Winkle and S. S. Cohen, Oak Terrace, Minn.—p. 249.
- Aspiration for Removal of Biopsy Material from the Liver: Report of Thirty-Five Cases. E. Baron, New York.—p. 276.
- Relation of Cardiac Output to Congestive Heart Failure. J. McGuire, Rose Shore, V. Hauenstein and F. Goldman, Cincinnati.—p. 290.
- Spontaneous Arteriovenous Aneurysms of the Thorax: Review of the Literature, with Report of Two Cases. E. L. Armstrong, C. B. Coggin and H. S. Hendrickson, Los Angeles.—p. 298.
- Bundle Branch Block: Criteria of Classification, Diagnosis and Prognosis; Study of 210 Cases, with Follow-Up Data. H. A. Freund and R. Sokolov, Detroit.—p. 318.
- *Gastroscopic Observations in Pernicious Anemia. R. Schindler and A. M. Serby, Chicago.—p. 334.
- Diseases of Metabolism and Nutrition: Review of Certain Recent Contributions. R. M. Wilder, D. I. Rutledge, Rochester, Minn., and D. L. Wilbur, San Francisco.—p. 356.

Abnormalities of Calcium Metabolism.—Taylor and his associates point out that faulty calcium metabolism accounts for a wide range of discomforts and disabilities and in some of its forms leads to untimely death. Calcium is deservedly a central figure in mineral metabolism. Americans ingest too little calcium salt. The body does not naturally conserve calcium. If there is a shortage in the supply of calcium or if there is an increased demand for it, excretion proceeds without economy and the organism is confronted with a progressive deficiency. Oversupply of calcium is probably never a practical problem in human beings. In persons with abnormal deposits of calcium salt, the problem is one of perversion of distribution and not one of excessive intake. The authors believe that one should suspect disturbance of mineral metabolism when there is defective nutrition. A child of subnormal stature may have congenital renal insufficiency, with a fault in the excretion of phosphate, as in renal rickets. A thin woman with diarrhea may be losing calcium, to the disadvantage of the function of the soft tissues; tetany may develop. A poorly nourished person with anemia may have poor absorption of iron or of calcium from the digestive tract. The food eaten may contain too little of these elements. Unusual fractures may be due not only to primary or secondary osseous neoplasm but to poor internal economy of calcium or of phosphate. A tonic convulsive state may be due to a lowered calcium content of the serum. Convulsions may result from both uremia and low calcium values. A high calcium content may cause or predispose to an abnormally slow cardiac rate or to rapid, irregular cardiac action. These effects were seen in a patient with a high calcium content secondary to metastatic carcinoma of bone. Not all spurious deposits of calcium salt are traceable to overabundance of calcium in the blood. In calcinosis and several allied diseases the calcium and phosphate contents of the serum are normal. For some reason there are points of diminished tissue viability in these conditions. Defective local circulation may be the reason. These regions become progressively buried in calcium salt. In cases in which bone is abnormally rarfied phosphatase is often present in the serum to excess. In Paget's disease, phosphatase is present in the bone in less than normal amount. When there is a suspicion of deranged mineral metabolism, the important facts can usually be obtained at the bedside with the aid of the laboratory and x-ray facilities in a class A hospital.

Gastroscopy in Pernicious Anemia.—Schindler and Serby made gastroscopic studies of twenty-three patients with pernicious anemia; nine were seen before any treatment had been given, fourteen after adequate treatment and three before and after treatment. All untreated patients presented superficial gastritis, superficial plus atrophic gastritis or patchy or diffuse

atrophy. No definite improvement of the condition of the gastric mucosa was found in four cases after treatment, atrophy definitely progressed in one, the mucosa of the antrum was found to be normal in seven, there was almost complete regeneration in one, and all portions of the gastric mucosa became normal in four cases. These facts can be explained only by the assumption that two separate diseases of the stomach are present in pernicious anemia. Primarily there is dysfunction of the cells which produce the "antianemic" factor. Secondly there follows degeneration of the surface epithelium, with superimposed genuine inflammation, which may or may not heal when the deficiency is eliminated. The secondary inflammation is usually combined with a similar disorder of the tongue and of the intestine, with dysfunction of the hemopoietic apparatus and combined degeneration of the spinal cord. However, the absence of the "antianemic" factor may sometimes lead to severe but reversible atrophic gastritis, without diseases of the blood. Atrophic gastritis may be due in many cases to some kind of deficiency and in some to the lack of the "antianemic" factor. This disease should be diagnosed by the use of the gastroscope. A gastroscopic check-up on the effects of therapy is necessary. The frequent incidence of mucosal polyps of the stomach in pernicious anemia has been corroborated.

Archives of Otolaryngology, Chicago

29: 199-402 (Feb.) 1939

- Abscess of the Brain: Relation of Histologic to Clinical Features. B. J. Alpers, Philadelphia.—p. 199.
Differential Diagnosis of Intrinsic Carcinoma of the Larynx. V. E. Negus, London, England.—p. 223.
Actinomycosis of the Ear. O. C. Risch, New York.—p. 235.
Tissue Culture of Nasal Ciliated Epithelium. A. W. Proetz and Marian Pfingsten, St. Louis.—p. 252.
Irrigation by Posterior Suction: Its Use in Treatment of Subacute and Early Chronic Posterior Sinusitis. N. Fox, J. W. Harned and S. Peluse, Chicago.—p. 263.
Radical Mastoidectomy: Its Use in Treatment of Dangerous Types of Suppuration of the Temporal Bone. N. A. Bolotow, Providence, R. I.—p. 269.
Process of Healing in Injuries to Capsule of Labyrinth. H. B. Perlman, Chicago.—p. 287.
Acute Mastoiditis from Surgical Point of View. S. Kulkin, New York.—p. 306.
Air-Borne Droplet Infection. H. C. Rosenberger, Cleveland.—p. 314.
Bucco-Antral Fistula: Method of Closure. G. Major, Pittsburgh.—p. 319.
Roentgenologic Study of the Hypopharynx, Larynx and Trachea: Its Use in Laryngeal Diagnosis. J. E. Mulsow, Milwaukee.—p. 326.
Sulfanilamide Therapy for Acute Otitis Media and Acute Mastoiditis. D. C. Baker Jr. and G. E. Bradford, New York.—p. 334.
Chronic Suppurative Lesions of the Petrous Pyramid: Report of Six Cases with Different Pathologic Characteristics. H. I. Lillie and H. L. Williams, Rochester, Minn.—p. 345.
Cylindroma of Upper Air Passages: Cylindromatous Type of Mixed Tumor. R. Kramer and M. L. Som, New York.—p. 356.

Suppuration of the Petrous Pyramid.—Lillie and Williams report six cases of chronic suppuration of the petrous pyramid; a presumptive diagnosis was made in five after careful consideration and integration of symptoms and signs. The diagnosis was confirmed by an operation directed primarily to the petrous pyramid. If discharge from the ear, low grade sepsis and deep retro-ocular pain, which were absent, had been insisted on as the cardinal symptoms and signs, the diagnosis would have been missed entirely. The six cases exemplify different pathologic processes, ranging through easesated abscess and meningitis to thrombosis of the cavernous sinus, meningitis and rupture into the nasopharynx. Two were cases of encapsulated chronic petrositis without apparent otitis media. While it is not comforting to think of apparently healed mastoiditis or petrositis becoming active again after a period of five or ten years, nevertheless it can do so. In certain cases in which there is an obscure clinical syndrome referable to the head, the history of aural disease may assume a place of great importance in determining the lesion causing such a syndrome. The cases presented show the futility of attempting to fit clinical material into didactic or academic pigeonholes. If exploratory operation had not been instituted before the appearance of complete symptoms and signs in the six cases, the result (five recoveries) might not have been so favorable. This group of cases demonstrates to the authors that it is necessary to approach the petrous pyramid without preconceived ideas regarding the surgical technique that will be adequate for the control of the disease encountered.

Archives of Physical Therapy, Chicago

20: 65-128 (Feb.) 1939

- *Evaluation of Skin Protection Against Ultraviolet Rays. A. Bachem and B. Fantus, Chicago.—p. 69.
Investigations in Fever Therapy. F. H. Krusen and E. C. Elkins, Rochester, Minn.—p. 77.
Roentgen Therapy for Inflammatory Lesions. E. T. Leddy, Rochester, Minn.—p. 85.
*Roentgen Treatment of Gas Gangrene. J. F. Kelly and D. A. Dowell, Omaha.—p. 88.
Thermotherapy of Bright's Disease and Its Complications: Preliminary Report. G. W. Stark, Syracuse, N. Y.—p. 94.
Short Wave Epilation. D. Derow, New York.—p. 101.
Chronic Myositis of Lumbar Region: Report on Studies of Fever Therapy. H. B. Shorbe, Oklahoma City.—p. 102.
Study on Economic Aspects of Physical Therapy. R. Kovács, New York.—p. 107.

Protection of Skin Against Ultraviolet Rays.—Bachem and Fantus studied the protective properties against sunburn of several materials by spectroscopic examination and cutaneous tests. From cutaneous tests they find that tragacanth paste is worthless as a protectant against sunburn, that vanishing cream, cold cream and white petrolatum are relatively much less effective than are mixtures of yellow petrolatum and wool fat petrolatum, cream salve and diachylon ointment. The cream salve tested gave the best result. This is an emulsion produced by the addition of about 50 per cent of water to a mixture of one part of wool fat and three parts of petrolatum. Its particular value is no doubt explainable by diffusion, reflection and absorption phenomena. Of the insoluble powders studied, titanium dioxide is the most efficient in its protective value and calamine is next in order. Barium sulfate and esculin were less efficient. Of soluble substances that gave promise of being useful as sunscreens ichthammol, leukichthol, caramel, quinine oleate and menthyl salicylate were tested; 2 per cent ichthammol was about as efficient as 4 per cent caramel (sugar coloring) or 5 per cent menthyl salicylate. Quinine oleate was not found to be as efficient as ichthammol and the other substances. As a sunburn protectant is applied to surfaces of the skin exposed to view, cosmetic quality of the preparation is essential. The authors therefore decided to take advantage of the "cuticolor preparations" developed by Fantus and Dyniewicz. "Cuticolor titanium dioxide" is made with titanium dioxide, which has been found to be the most efficient of the powders tested. To give this white powder a skin color, red ferric oxide (6 per cent) and yellow ferric oxide (8 per cent) are added. Rose water is employed to give it a pleasant odor. Such volatile oils as bergamot, lime, lemon, orange and cologne have photosensitizing qualities and should be avoided in sunscreens. The comparison of cuticolor ointment with various proprietary preparations on the market recommended for protection against sunburn shows that "cuticolor ointment" is superior to any of them and a test exposure of an individual to actual sunburn shows that cuticolor ointment is indeed efficient in a practical test. Formulas for six sunscreen preparations are listed any one of which, the authors say, has been found superior to a number of proprietary sun protectants on the market.

Roentgen Treatment of Gas Gangrene.—Kelly and Dowell believe that early and frequent treatment with small doses of roentgen radiation is the answer to the prevention or treatment of infections with gas forming organisms. They sent out questionnaires to about 100 physicians scattered throughout the United States and Canada from whom they obtained data on 143 cases (including their own). From the results obtained in these cases as compared with past experiences the authors are positive that x-radiation will lower mortality and lessen the necessity for amputation. The mortality rate alone is no longer a gauge of successful treatment of gas gangrene and they suggest that in the future the number of amputations as well as the deaths be included in reports concerning methods of treatment in this group of infections. An analysis of the cases reveals that only the severely affected patients will die in spite of x-radiation. Accordingly, treated properly no patient should die of pure gas gangrene but rather from other causes. When it is considered that it is the severely injured, senile or debilitated patients in whom gas gangrene develops, it is realized that the primary disease, without the complication of gas gangrene, presents a variety of handicaps which in themselves will cause death in from 3 to 7 per cent of all cases. The unfortunate

individual in whom gas gangrene develops after a hypodermic injection is an exception to the seriously injured or senile patient. Unexplained pain, swelling or fever following the injection calls for an x-ray examination to establish the presence of gas, in which case roentgen treatment is imperative.

Bulletin of Neurol. Inst. of New York, New York

7: 211-336 (Dec) 1938

- Cerebral Activity Including Conscious Sensation as a Physicochemical Process with Evidence to Indicate That Many Vital Processes Can Be Expressed in Simple Mathematical Relationships The Charles K. Mills Memorial Lecture. C. A. Elsberg, New York—p. 212
- Aspect of the Physiology of Intellect, Illustrated by Jacksonian Seizures R. M. Brickner, New York—p. 245
- Mental Disorders in Association with Epileptic Seizures in Two Patients with Tumor of the Brain L. M. Davidoff, Brooklyn—p. 260
- Granulomatous Encephalomyelitis Due to a Protozoan (Toxoplasma or Encephalitozoon). II Identification of a Case from Literature A. Wolf and D. Cowen, New York—p. 266
- Transitory Neurologic Changes During Hyperthermia R. T. Collins, New York—p. 291
- Cerebrospinal Fluid Potassium in Neurologic Disorders W. M. Honeyman and R. L. Zwemer, New York—p. 297
- Occurrence of Dissociated Disturbances of Pallesthesia and Kinesthesia R. W. Laidlaw, Mary Alice Hamilton and R. M. Brickner, New York—p. 303
- Apraxia and Aphasia S. Brock, New York—p. 321
- Nocturnal Epilepsy in Patients with Brain Tumor J. D. Spillane, New York—p. 328

Indiana State Medical Assn. Journal, Indianapolis

32: 51-100 (Feb) 1939

- The Present Status of Venereal Disease Control R. A. Vonderlehr, Washington, D. C.—p. 51
- Public Health Aspects of Venereal Diseases W. C. Kelly, Indianapolis—p. 54
- Laboratory Diagnosis of Syphilis W. Dodds, Crawfordsville—p. 57
- The Health Department in Syphilis Control M. Miller, Evansville—p. 59
- Treatment of Latent Syphilis F. R. N. Carter, South Bend—p. 60
- Neurosyphilis C. I. Williams, Logansport—p. 62
- Serodiagnosis of Syphilis L. Y. Mazzini, Indianapolis—p. 65
- Treatment and Management of Gonorrhea W. W. Hewins, Evansville—p. 69
- Recent Advances in Medicine That Are of Special Significance in Pediatrics H. F. Helmholz, Rochester, Minn.—p. 71
- Nupercaine Combinations Used in Spinal Anesthesia Eight Year Review F. W. Ratcliff, Lafayette—p. 74
- Hygiene of Infancy and Childhood Indiana Pediatric Society—p. 78

Journal of Experimental Medicine, New York

69: 179-326 (Feb) 1939

- Study of Rickettsiae Grown on Agar Tissue Cultures H. Zinsser, Florence FitzPatrick, and H. Wei, Boston—p. 179
- Specificity of Keratins L. Pillemmer, E. E. Ecker, and J. R. Wells, Cleveland—p. 191
- Growth of Fowl Coryza Bodies in Tissue Culture and in Blood Agar J. B. Nelson, Princeton, N. J.—p. 199
- Differences in Immunization and Sensitization in Rabbits Injected with Relatively Avirulent or Highly Virulent Cultures of the Same Strain (H) of Hemolytic Streptococcus D. M. Angevine, New York—p. 211
- Relationship of Infecting Dosage, Leukocytic Response, Bacteremia and Extent of Pulmonary Involvement to the Outcome of Experimental Lobar Pneumonia in the Dog O. H. Robertson and J. P. Fox, Chicago—p. 229
- Physiologic Conditions Existing in Connective Tissue I. Method of Interstitial Spread of Vital Dyes P. D. McMaster and R. J. Parsons, New York—p. 247
- Id. II The State of the Fluid in Intradermal Tissue P. D. McMaster and R. J. Parsons, New York—p. 265
- *Quantitative Relationships Between Immunizing Dose of Epidemic Influenza Virus and Resultant Immunity T. Francis Jr., New York—p. 283.
- Hereditary Brachydactylia and Allied Abnormalities in Rabbit H. S. N. Greene and J. A. Saxton Jr., Princeton, N. J.—p. 301
- Hemoglobin Production in Anemia Limited by Low Protein Intake Influence of Iron Intake, Protein Supplements and Fasting P. F. Hahn and G. H. Whipple, Rochester, N. Y.—p. 315

Relation of Immunizing Dose of Influenza Virus and Immunity.—Francis finds that a direct proportion exists between the concentration of epidemic influenza virus used for intraperitoneal immunization of mice and the degree of immunity to intranasal infection which develops. Mice vaccinated with virus of a given strength resist infection with virus of the same concentration but not more. The fact that there exists a limiting threshold for the degree of immunity which a certain strength of virus will induce indicates that the virus does not multiply after intraperitoneal inoculations. In ferrets a state of partial immunity is induced as a result of subcutaneous vaccina-

tion with active influenza virus. Vaccination with doses containing 100 or more intranasal infectious units is required for the production of circulating antibodies. Intranasal inoculation with one infectious unit results in a firm, immediate immunity, although the duration of immunity may bear a relation to the severity of the original infection and consequently to the size of the infecting dose. Ferrets in a state of partial immunity resulting from subcutaneous vaccination or from infection respond to intranasal inoculation of influenza virus with an accelerated production of neutralizing antibodies. The antibody titer under these conditions reaches a much higher level than occurs following a primary infection. Fully immune animals show no further antibody response to a second inoculation.

Journal of Lab. and Clinical Medicine, St. Louis

24: 449-558 (Feb) 1939

- Perforated Peptic Ulcer: Its Differentiation from Acute Pancreatitis by Blood Diastase Determination J. G. Probst, P. A. Wheeler and S. H. Gray, St. Louis—p. 449
- *Use of Urethane in Symptomatic Treatment of Bronchial Asthma. L. Farmer, New York—p. 453.
- Coexistence of Diabetes Mellitus and Diabetes Insipidus. Report of Case with Pregnancy. J. A. Greene and R. B. Gibson, Iowa City—p. 455
- Effect of Simultaneous Multiple Injections of Insulin on Blood Sugar E. Tolstoi and Janeth Raxner, New York—p. 458.
- Comparative Study of Mediums Employed in Isolation of Typhoid Bacilli from Feces and Urines Cora B. Gunther and L. Tuft, Philadelphia—p. 461.
- Effect of Lymphocytes in Vitro on Bacterial Toxins H. D. Moor and Norsuda M. Newport, Oklahoma City—p. 471.
- Takata Ara Reaction in Amyloidosis. A. Taran and S. Lipstein, Staten Island, N. Y.—p. 479.
- *Some Effects Produced in the Normal Stomach by the Ingestion of Moderate and Massive Quantities of Aluminum Hydroxide Gel J. P. Quigley, I. H. Einsel and I. Meschan, Cleveland—p. 485
- *Torula Infection of the Central Nervous System: Report of Three Cases R. G. Magruder, Charlottesville, Va—p. 495.
- Note on Stability of Picrotoxin Solutions. Phoebe J. Crittenden, Washington, D. C.—p. 500
- Hemoglobin Content of Human Blood V. C. Myers and Helen M. Eddy, Cleveland—p. 502.
- Combined Diphtheria Toxoid and Tetanus Toxoid, Alum Precipitated Prolongation of Accelerated Immunity Following Stimulating Dose of Antigen. F. G. Jones and J. M. Moss, Indianapolis—p. 512
- Preparation of Liver Mediums D. E. Hasley and H. Schalter, Detroit—p. 523.
- Photo Electric Colorimetry III. Quantitative Determination of Blood Glucose, Blood Cholesterol, Serum Phosphorus, Plasma Proteins and Urine Sugar. J. E. Andes and D. Northup, Morgantown, W. Va—p. 529.
- Routine Use of Concentration and Culture Methods for Detection of Tubercle Bacilli in Microscopically Negative Sputums and Other Body Fluids Elizabeth Petran and C. A. Perry, Baltimore—p. 539.
- Standard for Comparing the Vital Capacity of Subjects of Different Size and a Chart for Practical Use. D. J. Edwards and May G. Wilson, New York—p. 543
- Determination of Amino Acid Nitrogen in Blood and Urine Rapid Colorimetric Method M. Sahyun, with technical assistance of M. Goodell, Detroit—p. 548

Ethyl Carbamate in Treatment of Asthma.—During the last eighteen months Farmer has used ethyl carbamate as an antispasmodic in thirty cases of bronchial asthma. It was administered orally to adults in doses of from 1 to 2 Gm (dissolved in water). Not more than 4 Gm was given in any one day or for longer than four or five consecutive days. No untoward effects were observed. In fourteen of the thirty cases the alleviating action, which sets in after from fifteen to thirty minutes and lasts several hours, was most satisfactory.

Effects on Normal Stomach of Aluminum Hydroxide Gel.—According to Quigley and his associates, the administration of aluminum hydroxide gel in massive doses (120 cc. daily) for seventy-nine days to normal dogs was without significant effect on the gastric evacuation time or the histologic structure of the gastric tissue, and it only transiently reduced the gastric secretory response of free acid to histamine. Balloon records showed that quantities of aluminum hydroxide within the clinical range failed to produce a significant change in the motility or the tone of the stomach or pyloric antrum. These records were made while the medication was being introduced into the stomach or duodenum. It is believed that the therapeutic action of aluminum hydroxide depends largely on its buffering action on gastric acid and on significant modifications in gastric evacuation and secretory activity seen in the presence of ulcer or other pathologic changes but not in the normal intestine.

Torula Infection of the Central Nervous System.—Since October 1935 Magruder has observed three instances of torula involvement of the central nervous system. Case 1, on admission, presented a clinical picture resembling intracranial tumor. After careful neurologic, laboratory and x-ray studies the diagnosis was unsuspectingly made by culturing the yeastlike organism from the spinal fluid. The organism was believed to be a contaminant and the evidence was discarded. As a result, not until craniotomy had been done was the correct pathologic process determined. Case 2 was that of torulosis in a patient with diabetes mellitus and lymphatic leukemia. The diagnosis was made by the unsuspected finding of yeastlike budding organisms, on microscopic examination, in the spinal fluid. These were identified by further laboratory procedures as *Torula histolytica*. In the third case the torula infection (the organism was isolated in the spinal fluid) of the central nervous system was of one year's duration. The patient is still doing her daily housework with little inconvenience from the infection. The average length (Levine) of the disease is five or six months. The longest case on record is that of a patient who lived five and one half years. The total of such cases now reported in the literature is sixty-six. *Torula* infestation of the central nervous system may resemble tuberculous meningitis, encephalitis, cerebral tumor and sometimes abscess of the brain, dementia psychosis and dementia paralytica.

Journal of Nervous and Mental Disease, New York

89: 273-404 (March) 1939

- Biochemical Changes Occurring in the Cerebral Blood During the Insulin Treatment of Schizophrenia. H. E. Himwich, Albany, N. Y.; K. M. Bowman, J. Wortis, New York, and J. F. Fazekas.—p. 273.
- Nucleus of the Oculomotor Nerve, with Special Reference to Innervation of the Pupil and Fibers from the Pretectal Region. J. W. Benjamin, Evanston, Ill.—p. 294.
- Physicochemistry of the Cerebrospinal Fluid: I. Conductivity and Interferometry. Mona Spiegel-Adolf, Philadelphia.—p. 311.
- Anatomic Functions of the Cerebral Cortex. R. L. Crouch and J. K. Thompson, Columbia, Mo.—p. 328.
- Syndrome of Vestibular Paralysis in Man. P. M. Levin, Dallas, Texas.—p. 335.

Journal of Nutrition, Philadelphia

17: 103-198 (Feb.) 1939

- *Quantitative Study, by Means of Spectrographic Analysis, of Zinc in Nutrition. Florence I. Scoular, Denton, Texas.—p. 103.
- Rat Acrodynia and the Essential Fatty Acids. F. W. Quackenbush, Blanche Riising Platz and H. Steenbock, Madison, Wis.—p. 115.
- Studies of Fat-Free Diets. G. J. Martin, Winona, Minn.—p. 127.
- Concentration of Vitamin B₁ in Tissues of the Rat. A. S. Schultz, R. F. Light, L. J. Cracas and L. Atkin, New York.—p. 143.
- Hair Growth in Young Albino Rats in Relation to Body Size and Quantity of Food. E. O. Butcher, Clinton, N. Y.—p. 151.
- Long-Time Study of Nitrogen, Calcium and Phosphorus Metabolism on a Low Protein Diet. Bernice L. Kuerth and Martha S. Pittman, Manhattan, Kan.—p. 161.
- Long-Time Study of Nitrogen, Calcium and Phosphorus Metabolism on a Medium Protein Diet. Martha S. Pittman and Bernice L. Kuerth, Manhattan, Kan.—p. 175.
- Study of Breed and Seasonal Variations in the Ascorbic Acid Content of Certified Milk from Guernseys and Holsteins. A. D. Holmes, F. Tripp, E. A. Woelffer, Boston, and G. H. Satterfield, Raleigh, N. C.—p. 187.

Quantitative Study of Zinc in Nutrition.—Scoular performed thirty-five zinc balance studies, for which she used three normal boys of preschool age. The ashed food, feces, urine, distilled water and acid alcohol were analyzed spectrographically for zinc by comparing their spectrums with those produced by solutions of known concentration. The zinc values for food which were analyzed by quantitative spectrographic technic were found to be almost 40 per cent lower than the theoretical values estimated from published analyses for which the turbidimetric method has been used. From 0.04 to 6 per cent of the ingested zinc was eliminated through the urine. The rest of the excreted zinc, representing from 42 to 164 per cent of the ingested amount, was eliminated through the alimentary tract. Since more than two thirds of the thirty-five balance studies gave retentions which were significantly greater than the error determined for the method used, it would seem that zinc is associated with physiologic functioning. On the basis of the limited ingestion range studied it is tentatively concluded that 0.307 mg. of zinc per kilogram of body weight will supply the zinc needs of the preschool child.

Journal of Pharmacology & Exper. Therap., Baltimore

65: 129-226 (Feb.) 1939

- Local Anesthetic Properties of Certain Heterocyclic Compounds. G. A. Levvy and H. B. Nisbet, Edinburgh, Scotland.—p. 129.
- Studies of Cyclopropane: V. Effect of Morphine, Barbitol and Amytal on Concentration of Cyclopropane in Blood Required for Anesthesia and Respiratory Arrest. B. H. Robbins, J. H. Baxter Jr., and O. G. Fitzhugh, Nashville, Tenn.—p. 136.
- Influence of Certain Metals on the Stability of Insulin. M. Sahyun, A. Nixon and M. Goodell, Detroit.—p. 143.
- Vasomotor Action of Cocaine. W. H. Crosby, Philadelphia.—p. 150.
- *Chronic Oral Administration of Atabrine. S. J. Martin, B. Cominole and B. B. Clark, Albany, N. Y.—p. 156.
- Effect of Atabrine on Liver and Kidney Function. B. B. Clark, B. Cominole and S. J. Martin, Albany, N. Y.—p. 166.
- Effect of Thiobismol on Therapeutic Malaria. W. F. Schwartz, Cleveland.—p. 175.
- Effect of Anesthesia on Vasomotor Reversal. R. P. Herwick, C. R. Linegar and T. Koppanyi, Washington, D. C.—p. 185.
- Studies on Synergism and Antagonism of Drugs: III. Further Studies on Action of Nicotine and Physostigmine on Sympathetic Ganglions. C. R. Linegar, R. P. Herwick and T. Koppanyi, Washington, D. C.—p. 191.
- Metabolic Fate of N-Methylbarbituric Acids. T. C. Butler and M. T. Bush, Nashville, Tenn.—p. 205.
- Distribution of Administered Bromide in Comparison with Chloride and Its Relation to Body Fluids. G. B. Wallace and B. B. Brodie, with assistance of M. M. Friedman and D. Brand, New York.—p. 214.
- Distribution of Iodide, Thiocyanate, Bromide and Chloride in Central Nervous System and Spinal Fluid. G. B. Wallace and B. B. Brodie, with assistance of M. M. Friedman and D. Brand, New York.—p. 220.

Chronic Oral Administration of Atabrine.—Since daily medication is the rule in malarial prophylaxis, Martin and his colleagues made an attempt to determine the survival period, symptomatology, and the gross and microscopic changes in healthy rabbits, cats and dogs following repeated daily oral feeding of from 17 to 80 per cent of the minimal lethal dose of atabrine. These doses caused death in from nineteen to three days, respectively. The effects of such medication were chiefly gastrointestinal intolerance, disturbances of the central nervous system, progressively increased weight loss associated with anorexia and body weakness, and a yellowish discoloration of the skin, sclera and mucosa of the gastrointestinal tract. Animals receiving from 2 to 3 per cent of their oral minimal lethal dose of atabrine remained in good condition for from six to seven weeks and showed no symptoms except a slight loss in body weight. Gross and microscopic studies of animals examined post mortem revealed certain pathologic changes, but none were specifically characteristic of atabrine toxicity.

Journal of Thoracic Surgery, St. Louis

8: 239-350 (Feb.) 1939

- Heart Wounds: Report of Seventeen Patients Operated on in the Medical College of Virginia Hospitals and Discussion of Treatment and Prognosis. I. A. Bigger, Richmond, Va.—p. 239.
- Two-Stage Operation for Total Pneumonectomy in Treatment of Carcinoma of the Lung, Demonstrating New Technic for Closure of the Bronchus. W. F. Riehoff Jr., Baltimore.—p. 254.
- Hemidiaphragmatic Paralysis in Treatment of Pulmonary Tuberculosis. J. H. Forsee, St. Louis.—p. 272.
- Effect of Pneumothorax on Rate of Pleural Absorption of Fluids: Experimental Study. H. C. Maier, New York.—p. 283.
- Anesthesia for Intrathoracic Operations. H. H. Bradshaw, Philadelphia.—p. 293.
- Practical Points in Lobectomy. I. A. Sarot, New York.—p. 300.
- Mediastinal Teratomas: Report of Unusual Case. W. T. Doran and C. W. Lester, New York.—p. 309.
- *Tuberculous Lesion of Lung Eliminated by Suppurative Putrid Infection, with Recovery. S. Berg and R. H. Dieffenbach, Newark, N. J.—p. 316.
- Clinical and Roentgenologic Features of Pulmonary Abscess Located in the Superior Division of the Lower Lobes. D. W. Myers and B. Blades, St. Louis.—p. 321.
- Mediastinal Emphysema as Complication of Artificial Pneumoperitoneum. A. L. Banyai and G. H. Jurgens, Wauwatosa, Wis.—p. 329.
- Instillation of Opaque Oil into the Bronchus by Way of a Catheter Passed Through a Naris into the Trachea. H. B. Hunt and J. D. Bisgard, Omaha.—p. 334.
- Unusual Complication Occurring During Thoracoplasty. A. R. Judd, Glen Gardner, N. J.—p. 340.
- Thoracoplasty Brace. J. D. Steele Jr., Milwaukee.—p. 342.

Recovery Following Gangrene of Lung.—Berg and Dieffenbach state that acute pulmonary gangrene developed in a patient with a subclavicular cavity of several months' duration. This cavity was diagnosed tuberculous by the presence of certain symptoms and the absence of others, and by the presence of acid-fast organisms in the sputum on several occasions. The gan-

grene that developed consequently was extensive enough to involve the tuberculous area in its entirety. Complete recovery followed surgical drainage and thoracoplasty. This case differs from all other reported cases of the two conditions occurring simultaneously only in its favorable outcome. It is reported for the purpose of calling attention to the fact that if gangrene develops in other patients with tuberculous lesions accompanied by a low Gaffky sputum count the prognosis need not be considered hopeless. Modern surgical intervention permits some expectation of complete recovery

Journal of Urology, Baltimore

41: 103-264 (Feb.) 1939

- Hemorrhagic Cysts of the Kidney Report of Case. A. J. Scholl, Los Angeles —p 103
- Physiology of the Kidney from Clinical Standpoint D. R. Drury, Los Angeles —p 111
- *Nephrobronchial Fistula Reports of Two Cases H. P. Lee, Spokane, Wash —p 117.
- Treatment of Chronic Renal Insufficiency T. Addis, San Francisco. —p 126
- Ureterectomy Its Indications as an Adjunct to Nephrectomy. D. P. Eagerstrom, San Jose, Calif —p 137
- Unusual Case of Membranous Inflammation of Ureteral Stump with Spontaneous Rupture B. H. Hager and E. O. Boetticher, Los Angeles —p 151
- Endometriosis of Bladder. L. R. Reynolds, San Francisco —p 157.
- Value of Gradual Decompression and Preliminary Drainage in Bladder Neck Surgery J. R. Dillon, San Francisco —p 164
- Benign Bladder Tumor in a Two Year, Nine Month Old Child G. R. Ridlon, Seattle —p 173
- Pyelograms in Triplicate, Advantages of the Method T. D. Moore, Memphis, Tenn —p 177
- Bony Walled Cyst and Interstitial Cell Tumor of Epididymis, Calculous Pyohydronephrosis and Xanthoma of Abdominal Wall Case Report Preliminary Report of Spectrographic Analysis of Urinary Calculi C. P. Mathe, San Francisco —p 188
- Chemistry and Biologic Significance of Male Sex Hormones F. C. Koch —p 199
- *Precocious Hypertrophy of Prostate Following Persistent Treatment with Gonadotropic Hormone T. O. Powell, Los Angeles —p 206
- Male Sex Hormone Therapy. R. V. Day, Los Angeles —p 210.
- Ureteral Duplication with Extravesical Opening S. W. Mulholland, Philadelphia —p 220
- Suprapubic Cystostomy by an Endoscopic Technique L. D. Keyser, Roanoke, Va —p 228
- Concurrently Performed Cystoscopy and Intravenous Urography L. F. Huffman, Cleveland —p 234
- Pathogenicity of Cocci Isolated from Urine M. Goldstein, Rochester, Minn —p 237.
- New Operation for Relief of Incontinence of Urine and Feces Preliminary Report. O. S. Lowsley and R. W. Hunt, New York —p 252

Nephrobronchial Fistula.—Fistula secondary to inflammatory processes in and about the kidney may occur at any point adjacent to the renal area, but bronchial fistula is apparently rare. Lee points out that bronchial fistula should be suspected in those cases in which the patient gives a history suggesting a pathologic process in the kidney or perinephric abscess, accompanied or followed by pulmonary symptoms, severe cough and profuse sputum. Some degree of pulmonary involvement probably accompanies many perinephric abscesses, but the sudden onset of severe cough and profuse purulent sputum is a particularly significant symptom of bronchial involvement. Additional evidence suggesting perinephric abscess is rales or dullness in the overlying base of the lung and elevation of the diaphragm with an overlying inflammatory process in the lung. Drainage of the perinephric abscess usually results in immediate and marked relief of the cough and sputum, with a more gradual but usually complete clearing up of the pulmonary involvement. When the kidney is markedly involved, nephrectomy may be necessary later.

Precocious Hypertrophy of Prostate.—Powell reports a case of hypertrophy of the prostate in a boy of 17 years following treatment of undescended testes with gonadotropic substance. The return of the prostate to the near normal condition after treatment was discontinued in this case offers further proof of the causal relationship between the proved hypertrophy and the glandular therapy. The author warns that caution should be exercised by the physician in treating a young man past puberty with gonadotropic substance. It is his opinion that any patient receiving such treatment should be watched carefully and that treatment should be discontinued on the occurrence of the first symptoms indicating an abnormal stimulation of the secondary sex organs.

Kansas Medical Society Journal, Topeka

40: 45-88 (Feb.) 1939

- Congenital Hypertrophic Pyloric Stenosis. R. C. Fredeen, T. G. Orr and F. C. Neff, Kansas City. —p. 45.
- Spinal Cord Compression Injuries: Broken Necks and Broken Backs with Spinal Cord and Spinal Nerve Injury. R. M. Stuck, Denver. —p. 48.
- Anemias. W. W. Weltmer, Beloit. —p. 52.
- Regional Ileitis. O. W. Longwood, Stafford. —p. 54.
- Intestinal Obstruction, General Considerations and Results of Low Intestinal Intubation. J. B. Fisher, Wichita. —p. 57.
- Acute Uremia: Case Report. R. S. Casford, Kansas City, Mo —p. 64.
- Scarlet Fever Immunization. C. B. Summers, Kansas City, Mo —p. 65.

Kentucky Medical Journal, Bowling Green

37: 43-88 (Feb.) 1939

- The Proper Pelvic Examination. H. J. Davis, Owensboro —p. 43.
- The State Hospital Program. J. G. Wilson, Frankfort —p. 50
- The Prophylaxis and Treatment of Tetanus W. T. Maxson, Lexington —p. 55
- Cholecystitis Indications for Operation D. C. Elkin, Atlanta, Ga —p. 60
- Backache. D. E. Jones, Louisville —p. 64
- Habit Training and Habit Disorders J. W. Bruce, Louisville —p. 70
- Is Delay Justifiable in the Surgery of Acute Cholecystitis? A. E. Grimes and F. M. Massie, Lexington. —p. 73
- Hoarseness and Cough M. G. Buckles, Louisville —p. 76.

Medical Annals of District of Columbia, Washington

8: 31-64 (Feb.) 1939

- *Observations on Use of Chaulmoogra Oil in Arthritis C. Stanley, Washington. —p. 31.
- Vitaminoses as Observed in Private Work M. W. Perry and A. B. Chinn, Washington —p. 39
- The Problem of Chronic Alcoholism and Its Treatment R. V. Seliger, Baltimore —p. 44
- Measurement of Velocity of Blood Flow from the Arm to Lung by Use of Paraldehyde (Preliminary Report). B. Manchester, Washington —p. 49.
- Some Bacteriologic Aspects of Colitis A. F. Kreglow, Washington —p. 53.

Chaulmoogra Oil in Arthritis.—Stanley presents the results that he obtained with chaulmoogra oil in the treatment of fifty patients suffering from the atrophic, hypertrophic or mixed forms of arthritis. He acknowledges that the treatment is purely empirical but states that much relief of symptoms ensues. As a rule, the highest percentages of improvement were attained in the acute and subacute forms of the disease. The more general classification of cases was used. Two major hypotheses are proposed in an endeavor to account for the efficacy of chaulmoogra oil in arthritis: (1) its bactericidal potency and (2) its influence on the retention of calcium. While the use of chaulmoogra oil in arthritis is empirical, the uniformly favorable experience which has attended its employment by the author and others appears to warrant its continued trial as a therapeutic agent.

Medicine, Baltimore

18: 1-128 (Feb.) 1939

- Glycogen Disease S. Van Creveld, Amsterdam, Netherlands —p. 1.

Michigan State Medical Society Journal, Lansing

38: 89-184 (Feb.) 1939

- Fractures Involving the Elbow. K. Speed, Chicago —p. 105
- Postoperative Oxygen Therapy. E. R. Schmidt, Madison, Wis —p. 109.
- Obligations of the Medical Profession in Relation to Mental Health. F. G. Ebaugh, Denver. —p. 113.
- *Fever of Undetermined Etiology. D. S. Smith, Pontiac —p. 125
- *Further Observations on Distribution and Concentration of Sulfanilamide in Tissues of the Body After Enteral and Parenteral Administration J. J. Engelfried, Ann Arbor. —p. 129.
- Treatment of Burns. S. J. Seeger, Milwaukee —p. 133.

Fever of Undetermined Etiology.—Smith presents a review of patients discharged from the University Hospital during the last ten years in whom the final diagnosis was fever of unexplained etiology. Patients with fever of less than one month, those whose fever subsided during observation although not diagnosed, postoperative cases with fever and children less than 14 years of age were excluded from the study. After these restrictions were adhered to there remained seventy-five cases. Satisfactory follow-up information was obtained in fifty-one cases, some by reexamination, some by information from the local physician and some by questionnaire. Fever of unexplained origin occurred in four classes of patients: (1) those with acute or subacute infection, type and location not determined (thir-

teen), (2) those with neoplasms, origin not apparent (nine), (3) those with rheumatic infections (seven) and (4) those whose fever may possibly be psychogenic in origin (twenty-two). In the first group of cases fever of more than 101 F, leukocytosis or secondary anemia in the majority of them and an elevated sedimentation rate were found. These cases defy diagnosis, yet the diagnosis of sepsis would seem to be in order. The erythrocyte sedimentation rate has been found to be a rather accurate index of tissue destruction either in neoplasm (second group) or in infection. In the third group of cases one year elapsed before a diagnosis of arthritis was made. The probability is suggested that the rheumatic state was the cause of the fever from the beginning. Rheumatic heart disease occurs in many people who have never had arthritis. Also many persons with clinical rheumatic fever recover and evidence of a valve lesion never develops in them. However, it seems certain that some patients with undiagnosed fever in whom arthritis or a valve lesion never develops have rheumatic infection, how many must remain a matter of speculation until the etiology of rheumatic infection is positively determined and laboratory diagnosis in the active stage becomes possible. In the twenty-two cases of the fourth group there was no objective evidence of a pathologic condition at the time of observation and none has subsequently developed over periods varying from one to ten years. In this group every apparently indicated study was carried out with the exception of the brucella cutaneous test and the sedimentation rate, which was not done in some earlier cases. Most of the patients in this group were seen by a psychiatrist, who diagnosed psychoneurosis in the majority of them. Fever continued in all except one case. In this case the comparatively short period of fever before and after observation, five months and two months respectively, suggests the probability of an organic cause, of which the sedimentation rate might have given evidence. The duration of fever before the author's observation in these cases (average 3.8 years) and its length in the follow-up (average three years) would seem to be sufficient time for any organic cause to become evident or for fever due to most causes to subside. The author is inclined to agree with those who believe that fever can be of psychogenic origin and to classify these cases under this diagnosis. The recognition of psychogenic fever is exceedingly difficult and such a diagnosis should be considered only after a prolonged and thorough period of observation. The sedimentation rate is a valuable diagnostic procedure in differentiating infectious fevers from questionable psychogenic ones.

Distribution of Sulfanilamide in Tissues—Engelfried states that free and conjugated sulfanilamide may be recovered from all organs, tissues and fluids of the rabbit, guinea pig and man. There is a high percentage of conjugated sulfanilamide in the liver of normal rabbits. This percentage found in blood and various tissues of the animals varies with the individual animal. Sulfanilamide is eliminated from the body in the urine as free and conjugated sulfanilamide. However, a small percentage may be excreted in the stool. The complete elimination of the drug from the body will require several days, depending on the amount of drug stored in the tissue and the daily urinary output. The quantity of sulfanilamide recovered from the tissues and fluids of two normal adult rabbits four hours after the intraperitoneal injection of the drug was 78 and 81.2 per cent. Under the same conditions, 88.5 and 96.4 per cent was recovered from two normal adult guinea pigs.

Military Surgeon, Washington, D. C.

84:193 288 (March) 1939

- The Problem of Cancer with Special Reference to Heredity W S Baurbridge—p 193
Aortic Aneurysm and the Antiquity of Syphilis R C Holcomb—p 199
Treatment of Wounds in the Spanish War S Perez Vazquez, A Requero, L G Urgoit and M Diaz Serrano—p 203
Medical Department Lessons from the Fourth Army Maneuvers, 1937 D C Hilton—p 206
Resume of the Proceedings of the Medicomilitary Inactive Status Training Unit Oct 2-16, 1938 The Mayo Foundation, Rochester, Minn F L Smith—p 228
Clinical Photography in the United States Army R P Creer—p 232
Some Observations on Hydrochloric Acid H Pleasants Jr—p 235
Asepsis and Antisepsis Its Significance in Operating Room Management B A Goodman—p 246
Equine Facetophylomyelitis C F Schlotthauer—p 252

New England Journal of Medicine, Boston

220:175 220 (Feb 2) 1939

- Protean Character of Leukemias and of Leukemoid States H Jackson Jr, Boston—p 175
*Hyperhidrosis of Nervous Origin and Its Treatment by Sympathectomy J C White, Boston—p 181
Typhremia Report of Case of Typhoidal Form T L Badger, Boston—p 187
Neoplasms of the Testis Study of Results of Orchidectomy, With and Without Irradiation H Cabot and J Berkson, Rochester, Minn—p 192
Survey of Alcoholic Patients Admitted to the Boston Psychopathic Hospital in 1937 J B Dynes, Boston—p 195
Medical Aspects of Obstetrics T R Goethals, Boston—p 198

Hyperhidrosis of Nervous Origin and Sympathectomy.

—White believes that sympathetic denervation of the arm and leg offers a safe and certain cure for hyperhidrosis. The operation results in warm and dry extremities. If care is taken to avoid the ocular fibers (the section of which results in Horner's syndrome) and to leave the highest portion of the lumbar chain in the male intact (in order to preserve the power of ejaculation) there are no annoying sequelae. Case histories are presented. Hyperhidrosis in the hands was relieved in one case by paravertebral infiltration of alcohol round the first and second thoracic ganglions, with only a single night's hospitalization and without any interruption of the patient's employment. A second equally successful result has been obtained by Freeman. Nevertheless it is the author's belief that with rare exception surgical denervation is the better procedure, as its action is certain and the operative risk is almost nil in young and otherwise healthy individuals. After alcohol block there is considerable risk of incomplete results and some risk of producing a troublesome intercostal neuritis. The procedure must usually be carried out bilaterally, when it is safest to do the operation in two stages. The second operation can be done from four days to a week after the first, so that the total period of hospitalization is generally less than two weeks when both arms are denervated, and less than three weeks if both lumbar chains are resected.

New York State Journal of Medicine, New York

39:299 400 (Feb 15) 1939

- *Treatment of Dermatophytosis with Trichophytin, Convalescent or Immune Serum and Vaccines E F Traub and J A Tolmach, New York—p 305
Study of Infant Welfare in St Lawrence County in 1935 S W Sayer, Gouverneur, N Y—p 314
A Neglected Entity in Abdominal Pain and a Common Disease—Cirrhizing Enteritis E C Cutler, Boston—p 328
Surgical Treatment of Spastic Paralysis F A Chandler, Chicago—p 338
Treatment of Pneumococcus III Pneumonia with Rabbit Serum and Sulfanilamide R T Garrett, Southampton, and J R Twiss, New York—p 345
Economic Status of Patients Admitted to Tuberculosis Clinics of the New York City Department of Health H R Edwards and Hazel D Connell, New York—p 351
Restoration of Muscle Balance in Treatment of Obstetric Paralysis J B L'Escoffier, Brooklyn—p 357
*Sulfanilamide in Treatment of Chancroid B A Kornblith, A Jacoby and M Wisbengrad, New York—p 364
Common Duct Stone in an Early Typhoid Carrier Case H D Vickers, Little Falls, N Y—p 369

Treatment of Dermatophytosis.—A number of authors have reported high percentages of good results or "cures" with the various types of fungus extracts while a minority have found such preparations practically valueless. Traub and Tolmach question the advisability of using the term "cure" because only prolonged observation and repeated microscopic and cultural studies could determine this point. They believe that only those experiments can be accepted in which the authors actually proved that they were dealing with cases of dermatophytosis. "Mycotic-like" eruptions with a positive trichophytin test, cases of probable "ids" and eczematous hand and foot eruptions clinically called dermatophytosis and dermatophytid are not the carefully selected type of cases on which such a study should be based. It is difficult to evaluate accurately the results of therapy in dermatophytosis, which even if left untreated runs a most capricious course of improvement, apparent cure and relapse. Therefore the authors believe it doubly difficult to judge the value of the biologic remedies when local measures in addition to the injections of vaccines are used. Regardless of the type of vaccine or the type of case, the number of patients entirely uninfluenced by treatment remains high and

approximately the same and the number cured or improved relatively low. The longer that the authors followed their patients, the smaller grew the number of cases that they were able to report as "cured" or "improved." They do not feel that vaccine, trichophytin or convalescent serum treatment of dermatophytosis should be discarded but rather that stock of these agents should be taken. The biologic methods of treatment still belong in the laboratory and should not yet be advocated for general use. Some good results in a small number of cases have been reported, but the reasons for the small percentage of good results regardless of the methods of biologic treatment should be investigated. Perhaps the soil on which the fungi grow is altered by factors which have not been taken into account and which, if understood, might help in controlling the disease. Certainly the general health of the patient is a factor. In one instance a long standing proved case of dermatophytosis was completely cleared up following a thyroidectomy. The patient has been observed for seven years since operation and the eruption has not recurred. Methods of preparation of the vaccines and extracts and the question of dosages must be further studied and considered. At the present time it is the authors' belief that the usual local remedies, Whitfield's ointment, x-rays, boric acid ointment, wet dressings with boric acid, Burrow's solution or potassium permanganate and the like are still the most practical and useful agents at hand. The routine use of fungus extracts and vaccines by the dermatologist and general practitioner is not yet justified by the results obtained. Further work must be done in this field and this should be considered experimental only.

Sulfanilamide for Chancroid.—Kornblith and his co-workers used sulfanilamide in the treatment of ten cases of chancroid. For the first five days the patient was given daily 80 grains (5.2 Gm.) of the drug, 20 grains (1.3 Gm.) after each meal and before bedtime. From the sixth to the fifteenth day, inclusive, 40 grains (2.6 Gm.) was administered daily, 10 grains (0.65 Gm.) after each meal and before bedtime. After this period, treatment was stopped whether or not the lesion was healed. The entire treatment was ambulatory. There were no untoward effects. The patients were cautioned to stop the drug if diarrhea developed and not to use a saline cathartic in case of constipation. They were instructed not to drink more than 1 quart (liter) of fluid during any twenty-four hours. The only other treatment advised was the use of soap and water to cleanse the lesion locally twice a day. The average time for healing was about two weeks. The authors state that, since the foregoing was submitted for publication, sixty-five proved cases of chancroid have been treated with sulfanilamide and followed. The results have been uniformly excellent. There has been no failure or recurrence. All the lesions were healed after two weeks of treatment with sulfanilamide alone.

Oklahoma State Medical Assn. Journal, McAlester

32: 45-82 (Feb.) 1939

- The Surgical Diabetic. G. E. Stanbro, Oklahoma City.—p. 45.
 *Dual Etiology of Intractable Asthma. R. M. Balyeat and L. E. Seyler, Oklahoma City.—p. 49.
 Experience with Use of Prontylin: Case Report. H. R. Yandell, Ponca City.—p. 51.
 Experience with Use of Larostidin: Case Report. G. H. Niemann, Ponca City.—p. 52.
 Social Diseases at the Cross Roads. H. H. Porter, R. B. Witcher and C. Knoblock, Tulsa.—p. 54.
 Lymphopathia Venerum. J. V. Van Cleve, Wichita, Kan.—p. 61.
 Individuality in Treatment of Fractures Into or Near Joints. F. A. Stuart, Tulsa.—p. 64.

Dual Etiology of Intractable Asthma.—Balyeat and Seyler believe that more than 90 per cent of all cases of intractable asthma have a dual etiology: (1) sensitization factors (food, animal emanation and various dusts, pollen and miscellaneous) and (2) mechanical factors (mucus plugs, purulent bronchial secretions, asthmatic bronchiectasis and the usual form of bronchiectasis). Their recent work leads them to believe that the mechanical group of factors is of equal importance in the majority of cases and, in many, of greater importance than the sensitization factors. Practically all cases of intractable asthma start with periodic attacks of asthma due to local edema of the mucosa of the bronchial tubes, produced by contact with some substance to which the patient is specifically sensitive. Later a superimposed infection occurs in these patients, which

leads to the production of mucus or purulent material. The plugging of the bronchial tubes with mucus or purulent exudate mechanically produces attacks of asthma. Why asthmatic attacks in cases of intractable asthma occur about the same time each night is explained by the authors by the fact that the amount and rate at which mucus is secreted determine when the bronchial tubes are filled and nature requires them to be cleaned out—the asthmatic attack. In many cases of asthma it is difficult to determine what actually causes death. During the last two years the authors made bronchograms in about 200 cases of intractable asthma, and they find that the majority of patients suffer from some type of bronchiectasis. Most of these patients had leukocyte counts of from 12,000 to 18,000, which is evidence of toxin absorption. They believe, therefore, that death in the majority of cases of intractable asthma is due to chronic sepsis.

Pennsylvania Medical Journal, Harrisburg

42: 465-592 (Feb.) 1939

- Obstetric Review: Present Attainment and Future Hope. B. P. Watson, New York.—p. 475.
 Effects of Sulfapyridine, Sulfanilamide and Related Compounds in Bacterial Infections. P. H. Long, Eleanor A. Bliss and W. H. Feinstone, Baltimore.—p. 483.
 *Lipoid Pneumonia in Infancy and Childhood. I. J. Wolman, Philadelphia.—p. 492.
 Rational Management of the Nephritic Child. E. S. Thorpe, Philadelphia.—p. 495.
 Acute Infections of the Face. R. O. Dingman, Danville.—p. 499.
 Roentgen Therapy: Adjunct in the Armamentarium of the Otolaryngologist and Ophthalmologist in Treatment of Infections. L. E. Wurster, Williamsport.—p. 506.
 The General Practitioner and the 1938 Pneumonia Control Campaign. A. L. Luchi, Wilkes-Barre.—p. 509.
 Care of the Skin of the Newborn: Study of the Noncleansing Technic. J. A. Ritter and Ruth Stephenson, Philadelphia.—p. 514.
 Hypertension: Its Management. W. M. Bortz, Greensburg.—p. 517.
 Worth-While Immunization Procedures. P. F. Lucchesi, Philadelphia.—p. 521.
 Subglottic Carcinoma of the Larynx. L. H. Clerf, Philadelphia.—p. 527.
 Early Diagnosis of Carcinoma of the Colon. J. A. Soffel, Pittsburgh.—p. 531.
 Urticaria. S. R. Kaufman, Wilkes-Barre.—p. 534.
 Postgraduate Obstetric and Gynecologic Education: The Practitioners' Review. N. W. Vaux, Philadelphia.—p. 537.
 The Relation of the Ophthalmologist to the Pediatricist. W. S. Reese, Philadelphia.—p. 540.

Lipoid Pneumonia in Infancy and Childhood.—Broadly speaking, Wolman believes that lipoid pneumonia is preventable and that it could be eliminated if the facts concerning its etiology were known to all who share in the care of infants and children. Although individuals of any age may be affected, the disease is encountered more frequently at both extremes of life. Infants, and especially debilitated infants, seem to be particularly susceptible. The growing use of oily preparations, both as a source of vitamins and in the treatment of respiratory and gastrointestinal diseases, contributes to its increasing frequency. Infants should be fed cod liver oil only when awake and while held in a semierect or sitting position. Oily nose drops in the first two years of life are potentially dangerous; aqueous solutions for intranasal medication are preferable. Parents and nurses should be warned against the forcing of cod liver oil or other oils when the youngster refuses and resists. The blocking of a child's nostrils in order to make him swallow must be absolutely forbidden. Newborn or premature infants and all babies who vomit should be given vitamin concentrates rather than the larger doses of crude cod liver oil. In the feeding of oils and similar substances to weak or debilitated patients, especially to neurologic patients, the greatest forethought and precautionary care should be exercised; that is, aspiration should be prevented at any cost.

Public Health Reports, Washington, D. C.

54: 245-286 (Feb. 17) 1939

- *The Formol-Gel Reaction in Rheumatic Fever: Aid in Diagnosis of Active Carditis. M. P. Schultz and Edythe J. Rose.—p. 248.
 Concentration of Glutathione in the Erythrocytes of Patients with Rheumatic Fever. M. P. Schultz.—p. 264.

Formol-Gel Reaction and Carditis.—Schultz and Rose studied the serums of 108 febrile hospital or convalescent home patients afflicted with various diseases and seventy with rheumatic fever. The occurrence of both gelation and opacity were observed and recorded. When all the observations (or all in which the erythrocyte sedimentation rate was more than 9 mm.

an hour) in each group are compared, it is evident that positive formol-gel reactions were more frequently observed in rheumatic fever serums than in control serums, although the severity of the illness as reflected by an increase in the erythrocyte sedimentation rate was comparable in the two groups. This is due to the occurrence of more positive formol-gel reactions at relatively low erythrocyte sedimentation rates in the rheumatic fever patients. In the control patients ill with various febrile diseases, the formol-gel reaction was positive only in cases of severe illness. In these instances a parallel was demonstrable between the degree of erythrocyte sedimentation rate acceleration and the occurrence of positive reactions. The results in adult rheumatic fever patients severely ill with arthritis were similar. Patients with rheumatic carditis, on the other hand, reacted differently: (1) strongly positive formol-gel reactions were observed in individuals without obvious severe illness, with relatively little fever and with but slightly increased erythrocyte sedimentation rates, and (2) during the course of illness the occurrence of positive formol-gel reactions did not parallel that of most rapid erythrocyte sedimentation rates. In cases of rheumatic carditis the formol-gel reaction frequently became positive as the erythrocyte sedimentation rate was declining but coincident with the development of signs of active carditis. In some instances the test remained strongly positive while the erythrocyte sedimentation rate returned to normal. A strongly positive result in children, or in adults in the absence of arthritis, is suggestive of active carditis even in the presence of a relatively slow erythrocyte sedimentation rate. Persistently negative reactions indicate that severe carditis is probably not present and may be considered of favorable prognostic import. These observations suggest that the formol-gel reaction may be a valuable additional aid in determining the presence of active rheumatic carditis in patients known to be suffering from rheumatic fever. In those occasional instances in which positive formol-gel reactions persist longer than elevations in the erythrocyte sedimentation rate, this test may provide the only evidence of continued rheumatic activity warranting continued limitation of physical activity. The formol-gel reaction is apparently not influenced, as is the erythrocyte sedimentation rate, by the presence of cardiac decompensation or anemia.

Surgery, Gynecology and Obstetrics, Chicago

68:257-594 (Feb. 15) 1939

- Herniation Through the Diaphragm. J. J. Morton, Rochester, N. Y.—p. 257.
- Experimental Traumatic Shock: Further Studies, with Particular Reference to Role of Nervous System. A. Blalock and R. D. Cressmann, Nashville, Tenn.—p. 278.
- Benign Strictures of Bile Ducts with New Method of Treatment. G. E. Wilson, Toronto, Ontario.—p. 288.
- Cancer of the Stomach. W. H. Ogilvie, London, England.—p. 295.
- *Surgery for Ulcerative Colitis. F. W. Rankin, Lexington, Ky.—p. 306.
- Regional Ileitis. B. B. Crohn, New York.—p. 314.
- Regional Enteritis. C. G. Mixer, Boston.—p. 322.
- *Medical Treatment of Bronchiectasis. J. J. Singer, Los Angeles.—p. 327.
- *Results of Repeated Operations on the Stomach, Especially for Gastrojejunal Ulcers. H. Finsterer, Vienna, Austria.—p. 334.
- Recurrent Hyperthyroidism: Report of 306 Cases Operated on from 1928 to 1937. R. B. Cattell and E. S. Morgan, Boston.—p. 347.
- Contractures Due to Burns. W. T. Coughlin, St. Louis.—p. 352.
- Evolution of Fracture Treatment. I. Cohn, New Orleans.—p. 362.
- The Psychiatrist in Relation to Surgery. F. G. Ebaugh, Denver.—p. 372.
- Treatment of Otitic Meningitis Due to Streptococcal Infection by Surgery and Sulfanilamide. C. H. McCaskey, Indianapolis.—p. 377.
- Laryngeal Tuberculosis: Surgical Treatment Including Collapse Therapy. F. D. Woodward, University, Va.—p. 390.
- Study of Medical and Surgical Aids to Hearing. J. A. Babbitt, Philadelphia.—p. 395.
- Phylogenetic Development of Ear. J. M. Robb and H. Palmer, Detroit.—p. 401.
- Ocular Manifestations of Allergy. W. B. Black, Kansas City, Mo.—p. 406.
- Present Status of Surgery of Lacrimal Sac. R. O. Ryckner, Memphis, Tenn.—p. 414.

Surgery for Ulcerative Colitis.—Rankin states that medical management of chronic ulcerative colitis, which consists of a dietary regimen, administration of vitamin C, elimination of focal infections and the use of vaccines and serum, is effective to some degree in the majority of cases. The principal indication for surgery is intractability to medical treatment with resulting damage to the colon, following which the function of the colon

is lost and under which conditions it becomes filled with pus and detritus and is a source of absorption. Therefore surgery for chronic ulcerative colitis as for duodenal ulcer is indicated only for the complications, which occur in 15 per cent of the cases. These complications call for various types of surgical intervention. Surgery in the acute, fulminating or hemorrhagic forms of ulcerative colitis has few, if any, advantages. In this type of condition, ileostomy which completely by-passes the fecal current may be done under local anesthesia and occasionally appears to accomplish something. Total or subtotal colectomy should be carried out in multiple stages. Multiple stage operations increase the margin of safety. Sufficient time after an ileostomy should be allowed to elapse before resection is undertaken, in order to replace fluid loss, balance the blood chemistry and increase body weight and strength. The removal of a part or all of the large intestine for chronic ulcerative colitis is definitely desirable when the colon has lost its function.

Medical Treatment of Bronchiectasis.—In the diagnosis of the various types of bronchiectasis, infinite care must be exercised to arrive at definite conclusions. Fortunately, Singer declares that x-ray studies, expert laboratory facilities and the increased acumen in physical diagnosis have made it possible to sift out properly the bronchiectasis from the many pulmonary cases which formerly were diagnosed as tuberculosis, abscess of the lung or even as malignant conditions. Probably the greatest strides thus far have been in finding suitable cases for surgical approach. It has taken almost twenty years to have a fairly good idea of bronchiectasis, and in the next few years a cure may even be found. The careful study of the bacteriologic flora has contributed much to the knowledge of bronchiectasis. The treatment of sinus infections along with other symptomatic treatments have been helpful. The use of postural drainage has kept many patients so well drained of their purulent secretions that complications have been kept down to the minimum. The use of compression belts to support the abdominal muscles and also to raise the diaphragm has been effective in reducing discomforts of coughing and also aiding in expectoration. Medical treatment, while not always effective, has often improved the patient sufficiently for surgical treatment to be undertaken.

Results of Repeated Operations on Stomach.—Finsterer gives the results in a series of 331 cases in which repeated operations (2,753) were performed. There was a total mortality of 11.7 per cent, but it dropped to 8.6 per cent if cases complicated by acute perforation, acute hemorrhage or gastrocolic fistula are omitted. The most frequently performed previous operation was gastro-enterostomy, 190 cases, after which either the old ulcer had not healed or a gastrojejunal ulcer had formed. The radical operation for a gastrojejunal ulcer, following posterior gastro-enterostomy, shows a lower mortality, 6.8 per cent, than when it follows resection, 23.5 per cent. Therefore an operation is indicated at once by the return of complaints in a patient after gastro-enterostomy; and it is to be delayed if the complaints return after resection until at least several attempts with medical therapy have been made. The mortality rate attending the radical operation for recurrent gastrojejunal ulcer is 21.4 per cent. In acute perforation even the lesser operation, either closure or excision of the ulcer, produces poor results. Radical operation for gastrojejunal ulcer under general anesthesia showed a mortality rate of 42.1 per cent, nineteen cases with eight deaths. Three of these deaths were directly attributable to the anesthetic. With local anesthesia the mortality rate was 14.1 per cent. The best permanent results are achieved with the extensive two-thirds to three-fourths resection of the stomach and the preparation of the end to side anastomosis according to Hofmeister-Finsterer, even though there may have been several preceding operations. Of ninety-six patients, eighty-eight are permanently cured, or 91.6 per cent. The author states that the recurrence of a gastrojejunal ulcer after radical operation is not due to special ulcer disposition but to technical faults, too limited resection, Y shaped anastomosis or entero-anastomosis. Therefore, by avoiding these errors in technique, permanent cure is possible even after repeated resections. The term "surgically incurable ulcer" is not applicable to this type of case. The disadvantages of extensive gastric resection, too small a stomach and anemia are of little consequence since they are more easily controlled than a gastrojejunal ulcer following inadequate gastric resection.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Australian and New Zealand J. Surgery, Sydney

S: 225-332 (Jan.) 1939

- Percival Pott and His Puffy Tumor. K. F. Russell.—p. 225.
Cerebrocranial Injuries. G. W. Swift.—p. 228.
Drainage in Acute Appendicitis. A. Newton.—p. 241.
Achalasia of the Esophagus. R. Flynn.—p. 244.
Prostatic Surgery: Questions of Hemostasis and Secondary Hemorrhage. H. Newland.—p. 263.
Cause and Diagnosis of Prostatic Obstruction. R. G. S. Harris.—p. 266.
*Cellulitis of the Colon: Manifestation of Diverticulitis. W. A. Hailes.—p. 270.
Anesthesia in Gallbladder Disease: Methods of Treatment in the So-Called "Bad Risk Cases." H. J. Daly.—p. 280.
Motor Mechanisms of the Forebrain. F. Goldby.—p. 285.

Cellulitis of the Colon.—Obstruction from inflammatory reaction and swelling of a length of colon, occurring at the time of the acute inflammation, is the only type of intestinal obstruction that Hailes has encountered in diverticulitis. He refers to true obstruction and not to impaired function of the sigmoid colon. This swelling is much more extensive than that usually seen in the cecum in association with acute appendicitis in those cases in which the cecal wall is involved, a statement which applies both to the induration of the intestinal wall and to the length of intestine involved. The acutely inflamed sigmoid colon appears quite often to be the origin of the inflammatory exudate and not the diverticula. A large area of visceral peritoneum is inflamed. Because of the association of the swelling of the intestine with acute inflammation in one or more diverticula in these cases, it can be assumed that the inflamed diverticulum is responsible for the cellulitis and this cellulitis may be the most prominent lesion present. The cellulitis may be localized to one portion of the sigmoid colon or involve the whole sigmoid or even the whole of the descending colon. The degree of swelling of the intestine may be extreme and it is not uncommon to see a sigmoid loop so swollen and indurated that the loop in question is unmanageable surgically if obstruction has supervened. Cellulitis of the intestine pursues the same course as cellulitis elsewhere in the body and may lead to resolution, local abscess formation, with or without rupture, or obstruction. The presence of diverticula merely indicates the possibility of diverticulitis. A long filling defect, associated with a short history, inflammatory signs and the presence of diverticula, is significant but affords no more than a ray of hope that the condition may not be malignant. The author's experience is that the more extensive the cellullitic reaction, the more likely is the condition to be inflammatory and not malignant.

British Journal of Ophthalmology, London

23: 81-144 (Feb.) 1939

- "Egyptian Ophthalmia." F. W. Law.—p. 81.
Ocular Changes Associated with Naevus Flammeus. J. J. Evans and P. J. Evans.—p. 95.
Fluid Equilibrium of Body and Its Relation to the Eye. J. D. Robertson.—p. 106.

British Medical Journal, London

1: 199-256 (Feb. 4) 1939

- Fractures of the Neck of the Femur: Review of Thirty-Three Consecutive Cases. S. T. Irwin.—p. 199.
Tuberculosis: Dogmas and Doubts of Sixty Years. J. M. Martin.—p. 204.
*Epidemic Nausea and Vomiting. J. D. Gray.—p. 209.
*Sporadic Infections Due to Bacillus Typhosus. J. R. W. Hay.—p. 211.
Four-Lead Electrocardiograms Taken Fifty-Three Hours Before and After the Onset of Attack of Coronary Occlusion. A. Schott.—p. 213.
Operation for Fracture of the Olecranon. N. Dunn.—p. 214.

Epidemic Nausea and Vomiting.—Toward the end of 1938 an outbreak of nausea and vomiting occurred in South Hampshire. Gray describes this epidemic in order to show that the Thanet outbreak reported by Miller and Raven in 1936 was not an isolated incident and to suggest the probability of the widespread incidence of the disease. In general the illness is short, lasting about two days. The patient complains of dizziness, nausea and vomiting. Less frequently, dizziness and nausea alone may occur. It is usually afebrile. In the South Hampshire epidemic, frontal headache and occasionally bradycardia were also noted. In common with the Danish outbreak (1935)

diarrhea was encountered in the epidemic reported by the author and a higher incidence of mild pyrexia was seen as compared with that in Thanet. The epidemic occurred in an institution and the surrounding country at the same time, the total number of patients being twenty-six: thirteen women, six men and seven children. The first case was seen September 26 and the last October 31. Nineteen patients complained of giddiness, twenty-four vomited and all had nausea. Diarrhea was complained of by eleven, three had slight elevation of temperature, three had frontal headache and three had abdominal tenderness. As the disease is of such short duration it is difficult to decide what particular system is attacked. Earlier papers suggest either the gastrointestinal or the nervous system. So far, in all examinations made no organisms known to cause gastro-enteritis have been found. The greatest argument against a food or water contamination is the type of spread in families. Instead of the whole community going down at once there is a gradual peripheral spread. In the school cases two children went home and two days later both parents contracted the disease. In cases 15 to 20 of the country epidemic the passage from one individual to others in the family is clearly seen. Evidence would suggest that it is a person-to-person infection with an incubation period of at least two days. As Miller and Raven suggest, the probabilities point more to an acute infection of the central nervous system, possibly of a virus type. All the symptoms except the diarrhea may then be explained. Presumably a droplet infection is the mode of spread. It is difficult to assume that the attacks heretofore reported are isolated incidents; more probably sporadic cases occur about the country and flare to epidemic proportions only when the environment is ripe. The importance of this disease does not lie in its manifestations, which are mild, but in the possibility of its being confused with an outbreak of food poisoning or Sonne dysentery when it occurs in institutions. The latter are more serious matters than epidemic nausea and vomiting.

Sporadic Cases of Typhoid.—Hay gives an account of ten nonepidemic cases of typhoid seen during the last four years in two relatively small areas (population approximately 45,000 each). He believes that his report illustrates the protean nature of the disease with regard to its clinical manifestation, infectivity and transmission. In only two instances was typhoid suspected during the initial stages of the disease. The author states that his ten cases of sporadic typhoid illustrate (1) the difficulty in establishing a correct and early diagnosis on clinical grounds alone, (2) the importance of obtaining a specimen of blood for examination in any obscure case of fever or indefinite illness, (3) the apparent variation in susceptibility of individuals to infection, (4) the fact that transmission of the disease may occur in so many ways that each case presents an individual problem and (5) the value of close cooperation between the medical practitioner and the medical officer of health.

East African Medical Journal, Nairobi

15: 317-360 (Jan.) 1939

- Pulmonary Tuberculosis in Africans. W. H. Smith.—p. 318.
Observations on Nephritis in Uganda Natives. R. S. F. Hennessey.—p. 329.
Disposal of Night Soil in Small Townships (Modification of Indore Process). A. J. Boase.—p. 341.
Malaria Research in Tanganyika. Notes on reports by R. R. Scott.—p. 347.

Journal of Neurology and Psychiatry, London

2: 1-96 (Jan.) 1939

- Compulsive Features in a Patient with Leber's Disease. F. J. Curran.—p. 1.
The Arm Reflexes. G. De M. Rudolf.—p. 7.
Persistent Mirror Movements as a Heredofamilial Disorder. E. Guttmann, W. S. Maclay and A. B. Stokes.—p. 13.
Short-Distance Prognosis of Schizophrenia. E. Guttmann, W. Mayer-Gross and E. T. O. Slater.—p. 25.
Cortical Projection of the Medial Geniculate Body. H. H. Woollard and A. Harpman.—p. 35.
*Narcosis Therapy: Critical Review. R. D. Gillespie.—p. 45.

Narcosis Therapy.—In his critical review of the value of therapeutic narcosis, Gillespie states that continuous narcosis if thoroughly carried out is still fraught with some danger in spite of modifications in treatment. Freedom from risk is proportionate to the experience and care of those undertaking the treatment. The recovery rate in continuous narcosis in recent

psychoses never exceeds and usually falls short of the ultimate spontaneous recovery rate. Its therapeutic value is therefore confined mainly to curtailing the duration of psychotic conditions which would eventually pass spontaneously. It is most successful in manic excitements and considerably less successful with depressions of the manic depressive type. With recent schizophrenic disorders its effects are best in excited schizophrenia of the agitated fearful type and in hebephrenia in which the onset has been acute. Psychogenic schizophrenic disturbances in schizoid psychopathies are particularly amenable to this method. Little success is obtained with paranoid schizophrenia and with catatonic stupor. In general, when a psychotic illness follows a relapsing, recurring or periodic course with an acute onset and exogenic causes the more likely is continuous narcosis to curtail the episode. These are essentially the more spontaneously recoverable types. Continuous narcosis also has an administrative value in making chronic psychotic excitements more manageable. Occasional unexpected social recoveries are produced in chronic depressive (affective) psychoses and in chronic schizophrenia. Recently two authors obtained an unprecedentedly high recovery and discharge rate in a small group of schizophrenic patients in whom the duration of the illness was more than two years. The treatment is still entirely empirical and its efficacy is difficult to estimate because different investigators employ varying diagnostic criteria.

Lancet, London

1: 189-248 (Jan. 28) 1939

Effect of War on Civilian Populations. M. Wright.—p. 189.
Hormone Relationship Between the Ovary and the Adrenal Gland and Its Significance in the Etiology of Mammary Cancer. W. Cramer and E. S. Horning.—p. 192.

*Combined Serum and Sulfanilamide in Treatment of Streptococcal Infections in Mice. H. Loewenthal.—p. 197.

*Use of Placental Blood for Transfusion. A. P. M. Page, K. G. Seager and E. M. Ward.—p. 200.

*Transfusion with Placental Blood. J. Halbrecht.—p. 202.
Diverticula of the Duodenojejunal Flexure. R. W. Raven.—p. 203.

Serum and Sulfanilamide in Infections.—Loewenthal states that a single dose of sulfanilamide administered at the time of infection with hemolytic streptococci will protect only a minority of normal mice, whereas it protects the majority of animals which have received, from sixteen to eighteen hours before infection, a dose of antiserum which by itself is incapable of preventing death. Mice infected with hemolytic streptococci can be effectively treated with a combination of sulfanilamide and antiserum even if this treatment is given as late as eighteen hours after infection, when the animals are already severely ill. Since neither sulfanilamide nor antiserum alone achieves this result, it appears that these two agents act in a different but complementary manner.

Placental Blood for Transfusion.—Page and his associates have given twenty-five transfusions of stored placental blood and have had only one severe reaction. This did not appear to have been due to the placental blood but to the development of iso-agglutinins to the cells of the original donor, the patient's son. Slight rises of temperature have occurred on other occasions early in the series and have appeared to follow undue heating of the blood. The authors are now of the opinion that it is unnecessary to heat the blood to body temperature before use. Placental blood is preferable to ordinary adult blood because it contains no food allergens and because its clotting power is greater. The latter is an advantage in dealing with hemorrhage. A citrate saline solution has been found to be the best anticoagulant, for it gives minimal hemolysis after prolonged standing. Sterile collection of the blood is imperative if contamination is to be avoided. The authors find that the third stage of labor is not prolonged when placental blood is collected. There was no appreciable difference in the blood counts of twelve babies whose placentas had supplied blood and twelve controls, performed on the first, second and seventh days after birth and immediately before discharge from the hospital on about the fourteenth day. Icterus occurred in mild degree in three cases, one in the placental group and two in the control group.

Transfusion with Placental Blood in Malaria Countries.—Halbrecht points out that the use of preserved blood, especially placental, has an added advantage over fresh blood

in countries with endemic malaria. To be absolutely safe one must not inject fresh blood from any one who has at any time had malaria, whereas with placental blood, even if the mother has had malaria recently, the organisms usually do not pass the placental filter. Still more important is the fact that in preserved blood the plasmodium dies quickly. Preserved placental blood is thus doubly safeguarded. Up to now 116 transfusions of placental blood obtained from 520 placentas have been given. There were no serious accidents and only four reactions, three consisting of a chill and one of dyspnea and tachycardia. The author urges the greater exploitation of this source of blood and states that the need of blood for transfusions in Palestine is great, owing to the large number of casualties admitted.

Medical Journal of Australia, Sydney

1: 93-130 (Jan. 21) 1939

Medicine Past and Present. H. M. Fletcher.—p. 93.

*Serologic Types of Hemolytic Streptococci Causing Scarlet Fever in Sydney. C. White, G. V. Rudd and H. K. Ward, in association with F. H. Wilson and N. J. Symington.—p. 96.

Observations on Epidemiology of Streptococcal Infections. E. V. Keogh and Helen Kelsey.—p. 100.

Occurrence of *Hymenolepis Diminuta* (Rudolphi, 1819) and *Dipylidium Caninum* (Linnaeus, 1758) as Parasites of Man in Australia. A. J. Bearup and E. L. Morgan.—p. 104.

Group Practice. L. J. J. Nye.—p. 107.

A Trip Abroad, 1937-1938. J. E. Sherwood.—p. 112.

Types of Scarlet Fever in Sydney.—During a mild epidemic of scarlet fever in Sydney during the winter of 1936, White and his co-workers isolated and typed the infecting strains of hemolytic streptococci from 314 patients. The serologic classification of Griffith was used and the prevalent epidemic strain was found to be type XVII. A similar survey was carried out in the late summer, autumn and winter of 1938. During this period there was no epidemic prevalence of scarlet fever. No one serologic type predominated among the 307 patients. Type XI was found throughout the whole period, but its incidence remained at a fairly steady level. The distribution of Griffith's types causing scarlet fever in Sydney is different from the distribution found in England. In England, types I, II, III and IV account for from 60 to 70 per cent of scarlet fever; in Sydney, 75 per cent of the scarlet fever was caused by types I, IV, XI and XVII in the period under review. A comparison of the capsulated and noncapsulated strains suggests that the capsulated strains have a greater tendency to spread in a community. The capsulated strains are much more likely to give rise to familial infections than the noncapsulated strains. Cross infection was the rule rather than the exception. This confirms similar work in English hospitals.

Tubercle, London

20: 145-204 (Jan.) 1939

Fibrosis of the Lungs. G. T. Hebert.—p. 145.

*Treatment of Tuberculous Cervical Adenitis by Intraglandular Injections of Gelatin, Acriflavine, Calcium Chloride (GACC). R. A. Hunter.—p. 161.

Tuberculosis in Cyprus (Final Report). N. D. Bardswell.—p. 165.

Treatment of Cervical Adenitis.—Hunter used a medium made up of 0.85 Gm. of sodium chloride, 5 Gm. of calcium chloride, 5 Gm. of gelatin, 0.05 Gm. of acriflavine and enough distilled water to make 100 cc., in the treatment of twenty-one children with tuberculous cervical adenitis from 20 to 35 mm. in diameter. The medium was injected into the abscessed gland. From 0.3 to 0.5 cc. of the solution was used for every daily injection. The abscess regressed in twenty cases. Bilateral involvement was found in a few cases, and they responded satisfactorily to treatment. Scarring occurred in only three cases, in two of which they are difficult to detect. Twenty-nine children with slight adenitis with glands less than 20 mm. in diameter, and possibly tuberculous, received an average of three injections each of solution. A favorable response was obtained in twenty-eight. This method appeared to inhibit further hyperplasia; it holds out great promise in the prevention or treatment of cervical adenitis. After the medium has been injected at about six sites and provided the gland ceases to enlarge and soften, the injections can be discontinued until no further reduction in size takes place for a fortnight before more injections are given.

Bruxelles Médical, Brussels

19: 563-592 (March 5) 1939

Is Silicosis a Disease Entity? A. Langelez.—p. 563.

*Importance of Facial Paralysis in Localization of Cerebral Tumors. Y. Piette.—p. 572.

Facial Paralysis in Localization of Cerebral Tumors.

—Piette maintains that facial paralysis is observed frequently in the evolution of cerebral tumors. In the examination of thirty cases presenting the syndrome of intracranial hypertension it was observed twenty-one times. In one case it was due to a chronic subdural hematoma and in three cases an arachnoiditis existed. In the other cases there existed tumors of the cerebral hemispheres or of the posterior fossa. Facial paralysis was accompanied by homolateral pyramidal signs in five cases (frontoparietal tumor, tumor of the thalamus, cranio-pharyngioma, rolandic tumor and tumor of the fourth ventricle). The facial paralysis was of the peripheral type in only four of the cases; the cases in question were acoustic neurinoma, arachnoiditis of the posterior fossa, tumor of the fourth ventricle and a meningioma adhering to the tentorium cerebelli, passing between the cerebellar tentorium and the cerebral peduncles and then passing under the tentorium into the posterior fossa. This tumor was accompanied by homonymous, left-sided hemianopia and the syndrome of the right cerebellopontile angle. Facial paralysis of the peripheral type is an important symptom of tumors of the acoustic nerve and of the cerebellopontile angle. Facial paralysis of the central type is frequently encountered in cerebral tumors of various locations. When the paralysis is an isolated symptom it permits only the determination of the side of the location of the tumor. On the other hand, it assumes great importance if it is accompanied by early psychic disturbances or by motor aphasia. In these cases it indicates almost with certainty a tumor of the frontal lobe.

Gynécologie et Obstétrique, Paris

39: 81-160 (Feb.) 1939

Ovarian Endometriosis: Anatomic, Clinical and Therapeutic Study. G. Cotte and J. Mathieu.—p. 81.

*Indications for Ovariectomy in Course of Gestation. L. Portes and Varangot.—p. 99.

Fourteen Observations of Low Cesarean Sections with Exclusion of Inferior Segment and Drainage According to Mikulicz. L. Dignonnet.—p. 105.

Investigations on Serous Phosphatasemia in Course of Pregnancy. J. Caderas de Kerleau and J. Cayla.—p. 112.

Experimental Comparative Studies on Several Abortifacients. A. Patoir, G. Patoir and H. Bédérine.—p. 116.

Influence of Crushing and of Enucleation of Corpus Luteum on Menstruation. N. Kakuschkin.—p. 125.

Ovariectomy During Gestation.—Portes and Varangot maintain that the majority of surgeons, believing that the early exeresis of ovarian cysts avoids the complications due to their rapid growth, their suppuration and especially their torsion, think that "all cysts of the ovary that are diagnosed must be subjected to surgery." This essentially prophylactic conception, and from this point defensible, seems nevertheless in need of revision on the basis of the present biologic knowledge. Ablation of ovarian cysts is not always indicated because some of them, the follicular cysts for example, must be considered as "functional" cysts, abnormal to be sure but likely to disappear spontaneously after the biologic disorder which has given rise to them has subsided. In the course of gestation the prophylactic attitude which favors the ablation of the ovarian cysts appears to have greater justification by reason of the extreme frequency of torsion, which may develop unexpectedly either in the course of gestation or immediately after delivery. However, there are contraindications to surgical intervention; on the one hand, it must be considered that many of the cysts are purely functional; the lutein cysts, for instance, are relatively frequent in the course of gestation; on the other hand, the effects of ovariectomy on the development of the frequency are uncertain. On the basis of experiments on animals and of clinical observations, the authors have been led to accept the following points with regard to ovariectomy in the course of gestation: 1. Ovarian cysts that are diagnosed during pregnancy do not necessarily have to be subjected to surgical treatment or, in an emergency, they have to be so treated only as late as possible. 2. It is wise to remove them only when this

is necessary on account of mechanical or infectious complications (torsion, hemorrhage and suppuration). 3. Even in cases in which the intervention is formally indicated, it is advisable to respect the corpus luteum as much as possible, which is easy when it is localized in the healthy ovary, but it is also often possible by dissection or partial resection of the cystic pockets, when it is localized in the diseased ovary. 4. Finally, in the cases in which the ablation of the corpus luteum is inevitable, it is advisable to substitute for it, after the operation, by injecting daily and for a long period massive doses of progesterone without counting too much on the secretory action of the placenta. The authors consider this attitude as the one which, at least in principle, respects the pregnancy as much as possible when it is associated with the development of ovarian cysts.

Presse Médicale, Paris

47: 257-280 (Feb. 18) 1939. Partial Index

Contribution to Study of Pleural Endothelioma. E. Sergent and R. Kourilsky.—p. 257.

Fibrous Osteitides Without Parathyroid Adenoma. R.-J. Weissenbach and J.-A. Lièvre.—p. 260.

*Accidents in Skiing. J. Braine and C. Goury.—p. 263.

Dilatation of Bronchi and of Trachea in an Adult. D. Olmer, J. Olmer, J. Vague and J. Gallian.—p. 272.

Septic Infarct of Myocardium in Course of Secondary Malignant Endocarditis. R. Lutembacher.—p. 273.

Gastric Syphilis. S. Davicovic.—p. 275.

Roentgenologic Aspect of Notches of Vertebral Bodies of Children: Its Anatomic Substrate. P. Passebois and P. Bétoulières.—p. 280.

Accidents in Skiing.—Having discussed the incidence and the etiology of skiing accidents in a previous report, in this paper Braine and Goury take up the lesions as such. The lesions of the inferior members are most frequent and most characteristic in skiing. The typical lesions result first of all from torsional movements, conditioned by the close connection of the foot with the ski. Soon they are restricted to the region of the ankle, the most vulnerable site in the skier; soon the torsion is transmitted to the knee. Moreover, the lesions may be in the hip or in the trochanteric region. The sprains of the ankle joint injure chiefly the external lateral ligament, the anterior talofibular fasciculus of which is typically broken by forced adduction. Following further discussion of benign and grave sprains of the ankle joint, the author takes up the typical skiing injuries of the knee joint. The majority of them, not being grave, escape medical control, for many skiers content themselves with bandaging their own injured knee. As a rule it is the tibial collateral ligament which is injured. Other lesions of the knee that are encountered in skiers are ruptures of the cruciate ligaments and partial fractures by tearing away of the tibial spine, the edge of the tibial plate and so on. Lesions of the menisci, although often suspected, are rarely confirmed. The fractures of the leg that are typical for skiing are the spiral fractures. The tibial lesions are usually located below the middle of the leg. The point of the upper fragment often menaces the skin. The fibula is usually fractured higher up than the tibia. Nevertheless, although it happens rarely, the two bones of the leg may be fractured simultaneously and at the same level. Fractures of the thigh result often from direct contact with an obstacle. However, spiral fractures by torsion are also observed in the thigh. They are often in three fragments and are localized either in the upper third (subtrochanteric) or in the median third of the diaphysis. Fractures of the neck of the femur are rare in skiers, but trochanteric fractures are characteristic, particularly in skiers with insufficient training. Sprains of the hip joint and ruptures of the psoas muscle may give rise to deep pericoxal hematomas. Among the lesions of the superior members the dislocation of the shoulder takes the first rank. The role of the skiing sticks seems to have been exaggerated in the etiology of this lesion. It appears that a certain position of the arms favors this lesion. The traumas of the hand of the skier have two classic locations: they are metacarpophalangeal sprains of the thumb and metacarpal fractures. In these lesions the skiing sticks do play an essential etiologic part. Other lesions of the superior members which occur in skiing are those of the wrist, the forearm, the elbow and the humerus. Excoriations, particularly of the face, may result in unsightly scars. Although cranial fractures are rare, commotio cerebri and lesion of the eye are of considerable importance. Some of the ocular lesions

lead to loss of vision. Traumas of the vertebral column involve chiefly the cervical portion. The thoracic lesions are as a rule more or less severe contusions. Traumas of the abdomen may cause visceral lesions. After pointing out that adequate training of the skier will prevent many accidents, the authors stress the importance of suitable first aid. Transportation of the injured has been organized and improved by the efforts of an international association. Discussing transportation, the authors stress the advantages of Pourchier's ski-sleigh, a sort of stretcher-sleigh combination which can be constructed with the aid of the skiing equipment, the skis serving as runners and the sticks as framework of the stretcher; illustrations clarify the construction. The treatment of sprains has been greatly improved since the use of Leriche's method (local injection of anesthetics) has become widely known. Many skiers now carry syringes and ampules with them. The reduction and immobilization of fractures must be accomplished as early as possible.

Schweizerische medizinische Wochenschrift, Basel

69: 165-188 (Feb. 25) 1939. Partial Index

Criticism of Short Wave Therapy on Basis of Histologic Aspects. S. Jellinek.—p. 165.

Practical Hematology. W. Meyer-Hartmann.—p. 170.

*Second Disease in Pernicious Anemia. H. Liechti.—p. 172.

Changes in Secretion and in Blood Following Gastric Operations. G. G. Fravi.—p. 174.

Second Disease in Pernicious Anemia.—Liechti maintains that, if a patient with pernicious anemia contracts a second disease, the latter may replace the manifestations of the first. The second disease effects an alteration in the hemopoiesis; it does not, as might be assumed, further develop the megalocytic hyperchromic blood picture. On the contrary, the hemogram has a tendency to assume a hypochromic character with macrocytic or normocytic erythropoiesis. The myelopoiesis, which is usually impaired in pernicious anemia, often shows a considerable increase under the influence of the second disease. If observed early, this alteration in the hemopoiesis may be of great diagnostic significance; not that it indicates the type of disorder, but it does indicate that such a disorder exists, even though its symptomatology is still latent. The author describes case histories to illustrate this. In the first case gastric cancer developed in addition to pernicious anemia. The alteration in the hemopoiesis was observable several months before the gastric symptoms appeared. In the second case pulmonary tuberculosis developed in addition to pernicious anemia. In this case again a hyperchromic hemogram was changed to a hypochromic one. The author concludes from these observations that patients with pernicious anemia are in need of constant supervision of their blood picture not only because of a possible relapse of the pernicious anemia but also because a second, perhaps more malignant, disease may develop and produce alterations in the hemogram. Cases of pernicious anemia which later became complicated by gastric cancer have been reported repeatedly in recent years. The concurrence of these two diseases does not seem to be mere accident. To be sure, in some instances of concurrence the gastric cancer is primary, and anemia with the aspects of the pernicious type develops after the extensive gastric resection.

Folia Medica, Naples

25: 57-112 (Jan. 30) 1939. Partial Index

*Urea in Suppurative Surgical Infections. A. G. Chiariello.—p. 61.

Chemical Changes of Skeletal Muscles from Electrical Trauma. G. Montemartini.—p. 76.

Urea in Surgical Infections.—Chiariello observed the results of local application of urea in the treatment of surgical infections in thirty-one cases. The results were satisfactory. In the first series of experiments he observed the effects of urea in comparison with those of other local treatments (application of olive oil or of a 5 per cent solution of tannic acid or a local aseptic medication) in experimental septic burns. In the second series he compared the evolution of experimental aseptic wounds which were treated by local application of either urea solution or of a local or aseptic medication. The author found that urea has a detergent and deodorant action and that it stimulates regeneration of infected tissues. The results are better in chronic osteomyelitis, suppurated favus of the neck and infiltration of the urinary tract from suppuration than in

varicose ulcers of long duration and in some other conditions which are related to factors other than the local ones. The treatment gives satisfactory results when it is administered after performance of the necessary surgical interventions but not otherwise. Urea stimulates autolysis of dead tissues and increases the local defenses of new tissues against the local infection. The action of urea on epithelization is slight. The bactericidal effect of urea is indirect. From the clinical and experimental results the author concludes that urea is of value in the treatment of surgical infections.

Gazzetta degli Ospedali e delle Cliniche, Milan

60: 25-48 (Jan. 8) 1939

*Mester's Test for Diagnosis of Rheumatic Diseases. G. Braghin.—p. 27.

Mester's Test for Rheumatic Diseases.—Braghin performed Mester's salicylic acid test on a group of 135 persons either normal or suffering from rheumatic or nonrheumatic diseases. The test was carried out by the original technic, which is as follows: Blood is withdrawn from the middle finger of the right hand of fasting patients before and again thirty and sixty minutes after administration of two or three intracutaneous injections of 0.2 cc. each of a sterile 0.1 per cent aqueous solution of salicylic acid, and the number of leukocytes is determined after each withdrawal. The injections are made at the flexor aspect of the right forearm at a distance of about 5 cm. from each other. They are followed by severe pain and burning sensation of short duration and by the formation, at the points of the injections, of wheals which disappear in a few hours. Positive results are shown by transient leukopenia within the first thirty minutes (and in rare cases within the first sixty minutes) after administration of the injections. The diminution of the leukocytes varies from 20 to 50 per cent or more in comparison with figures which existed before administration of the injections. The author reports the results of his observations in tables. The test gave positive results in all forty-five patients (first table) who were suffering from rheumatic diseases which included acute, subacute and chronic rheumatic polyarthritis, rheumatic ankylopoietic spondylarthritis, rheumatic ischalgia, rheumatic fever with cardiac complications and chronic rheumatic iridocyclitis. The number of leukocytes diminished within 30 and 50 per cent but not more than that. The positive results were obtained in forty cases in the blood which was withdrawn thirty minutes after the injection and in five cases in that which was taken sixty minutes after the injection. The test gave negative results in the group of thirty-one patients (second table) who were suffering from nonrheumatic diseases with symptoms similar to those of rheumatic diseases. The group included patients with tuberculosis, syphilis, articular gonococcal infection and gout. The test gave also negative results in a group of fifty-nine persons (third table), including normal persons and patients with other than rheumatic diseases. The author concludes that the test is specific for the diagnosis of rheumatic diseases. The test is a hemoclastic reaction of the type of that described by D'Amato for syphilis rather than an anaphylactic reaction, as the author previously believed.

Riforma Medica, Naples

55: 161-200 (Feb. 4) 1939

Functional Relations Between Spleen and Stomach. L. Gipperich and U. Butturini.—p. 163.

*Chemotherapy in Gonorrhea. M. Muscolino.—p. 170.

Multiple Congenital Malformations of Leg. V. Ferrara.—p. 178.

Sulfanilamide in Gonorrhea.—Muscolino observed 161 patients who had been given sulfanilamide in the treatment of gonorrhea. All but six (girls) were adults. The adults were given the sulfanilamide in daily doses of from 2 to 3 Gm. in cycles of five consecutive days each with intervals of rest for four days, during which time no other drug was administered, until two cycles had been reached and in rare cases four cycles. The six girls, who had vulvovaginitis, were given daily doses of 1 Gm. for four consecutive days followed by intervals of rest of four days, without any other drugs, up to two and rarely three cycles. Local antiseptic lavages of a weak (1:10,000) permanganate solution were administered daily all during the treatment. The latter failed to control the vulvovaginitis in young girls and was soon discontinued in

three adults because of the intolerance of the patients. The treatment controlled gonorrhea in 113 of 152 adults. The symptoms are abated early in the course of the treatment; the secretion is diminished and soon disappears. As observed microscopically, gonococci completely disappear from the secretion. The drug gives the best results in chronic and subacute gonorrhea and their various complications and better results in men than in women. The satisfactory results are permanent. The author observed the behavior of the crisis of the blood and the spermatogenesis during and after administration of sulfanilamide, in the mentioned doses. It had a slightly harmful but transient effect on the crisis of the blood of fifty patients with acute gonorrhea. It did not interfere with spermatogenesis in five normal men or in five cases of acute gonorrhea. Muscolino therefore concludes that sulfanilamide is valuable in the treatment of gonorrhea and that in the mentioned doses it is both efficient and harmless.

Archiv für Gynäkologie, Berlin

168: 1-350 (Jan. 17) 1939. Partial Index

- Endometriosis Externa with Consideration of Cases of Unusual Localization. M. Tausch.—p. 8.
Aminogenic Fetal Deformities. F. Movers.—p. 22.
Naegel's Computation of Term of Birth in Light of Knaus's Theory. F. Friedl, L. Rindler and A. Geller.—p. 26.
Hormone Content of Placenta in Prolonged Pregnancy. K. D. Rosenkranz.—p. 51.
Perispermoid Adhesions in Women. N. M. Kairis.—p. 84.
Substances Inhibiting Uterine Activity in Thymus and Liver of Fetus. S. Tapper.—p. 169.
*Treatment of Benign Uterine Hemorrhages in Women Over 40 with Special Consideration of Symptoms of Abolished Function. M. Penkert.—p. 209.
*Prognosis of Postpartum Intra-Uterine Interventions if Performed in Clinic. F. Geppert.—p. 235.
Practical and Theoretical Aspects of Treatment of Menstrual Anomalies by Means of Hormones of Female Gonads. L. Nürnberger.—p. 240.
Clinical Estimation of Hyperemesis Gravidarum. R. Fikentscher.—p. 331.

Treatment of Benign Uterine Hemorrhages.—Penkert discusses the nature of menstrual hemorrhages and their irregularities in women beyond the age of 40 years. Then he gives his attention to the symptoms of abolished function, pointing out that they are most severe after roentgen castration and other forms of irradiation and that they are much less severe and less frequent, or even entirely absent, after removal of the diseased uterus with preservation of the ovaries. Even though the vaginal total extirpation of the uterus, without the ovaries, is not the ideal treatment of metropathias, as regards the absence of the symptoms of abolished function, as regards the rapidity of recovery and as regards the capacity to work again, it is by far superior to the roentgen castration; the same can be said about the abdominal total removal of the uterus without the adnexa in the presence of large myomas. After stressing the contraindications to the ray treatment of myomas, the author says that every benign uterine hemorrhage requires an exact diagnosis and then there arises the question, What is the best treatment for this patient? Roentgenologic treatment involves on the whole less risk and less responsibility than does an operation. Nevertheless, although the author was one of the first who introduced and advocated the roentgen treatment of myomas and metropathias, many years of observations and some disappointments have brought him to the point at which he resorts to this treatment only with reservations and in specially selected cases. He has come to the conclusion that, in spite of the great dangers that are involved in an operation, surgery is nevertheless the most prompt and best method.

Postpartum Intra-Uterine Interventions.—Geppert demonstrates that the prognosis of postpartum intra-uterine interventions that are carried out in modern clinics can be regarded as favorable as regards morbidity as well as mortality, provided of course the management of the delivery has been under clinical supervision from the beginning. The results obtained with postpartum intra-uterine interventions in the clinic are superior to those obtained in home practice, because the aseptic conditions and the presence of trained persons makes an intervention possible, before great loss of blood has taken place. To be sure, it is generally difficult to foresee disturbances of the period of the after-birth. It is known

that they may appear without recognizable cause. For this reason a number of parturient women must undergo intra-uterine interventions in the home and thereby are exposed to greater hazards. However, the author thinks that women who in earlier deliveries experienced difficulties during the period of after-birth and those who have had abortions or curettages may expect difficulties in the delivery of the placenta in subsequent confinements and it has to be decided whether for these cases delivery in the clinic might perhaps be advisable.

Archiv für klinische Chirurgie, Berlin

184: 171-730 (Jan. 18) 1939. Partial Index

- Typical Callus Formation After Ideal Reposition and Wire Suture of Fractures of Thigh. M. Biehl.—p. 171.
Papillomatous Ovarian Mucicystoma Associated with Myxoglobulosis of Appendix. O. Bittmann.—p. 228.
*Diagnosis and Surgical Treatment of Acute Venereal Lymphogranuloma. C. Reimers.—p. 264.
Organoid Character of Fibro-Adenoma of the Breast. H. Güthert.—p. 312.
*Therapy, Pathologic Anatomy and Concept of Thyrotoxicosis. A. Troell.—p. 347.
Effect of Padutin on Circulation. D. Schneider and P.-W. Springorum.—p. 373.
Surgical Treatment of Hyperthyrosis. T. von Matolcsy.—p. 390.

Acute Venereal Lymphogranuloma.—Reimers reports forty-five cases of acute venereal lymphogranuloma treated at the surgical clinic of the Military Medical School in Canton, China. In smears made from human lymph nodes and infected brain of white mice stained by the Giemsa method, the author found both intracellular and extracellular "granulocorpuscular" elements. However, the author is uncertain as to the practical clinical value of this observation in early diagnosis. In his experience the intracerebral implants of lymph node material or of pus in white mice permits an earlier diagnosis than the Frey antigen, even though it requires not less than eight days. The identity of climatic bubo and of venereal lymphogranuloma was established by the crossed reaction of the European antigen and an antigen prepared by the author. The microscopic examination of the tissues, especially in mixed infections, is as valuable in diagnosis as the Frey reaction. For therapeutic purposes the author divided his cases into the following stages: (1) the stage of abscess formation, (2) the stage of inguinal lymph node enlargement, (3) the stage of iliac lymph node enlargement, (4) the fistulous stage and (5) the residual ulceration. He advocates conservative treatment for the acute stage. For the second and fourth stages he suggests radical removal of the involved glands, while involved iliac lymph nodes are to be operated on only in exceptional cases. On the basis of his observations in several of the cases, syphilis likewise is a factor in the formation of genito-anorectal elephantiasis (esthiomene). The author stresses the point that application of the Frey antigen tests in the differential diagnosis of all chronic inflammatory diseases of the large and small intestine should be of value, because the differentiation of venereal lymphogranuloma from other chronic inflammatory diseases on a clinical basis alone is not possible.

Thyrotoxicosis.—Troell operated in 1,842 cases of thyrotoxicosis during the period from 1930 to 1937. His operative mortality, which up to 1924 amounted to 9.6 per cent, fell considerably after the introduction of compound solution of iodine in 1925. This mortality in 354 surgical cases between January 1925 and October 1930 was 3.3 per cent, while the mortality from that period up to 1937 in 579 surgical cases amounted to 2.6 per cent. In the beginning only patients with diffuse exophthalmic goiter were placed on preoperative treatment with compound solution of iodine. Later this treatment was extended to highly toxic cases of nodular goiter. In the cases of nodular goiter of mild toxicity the author used both before and after operation a preparation called "kinifos." This is a preparation consisting of quinine, sodium bromide, sodium phosphate and calcium lactate. The reason for withholding compound solution of iodine from patients with toxic nodular goiter was partly the fear of inducing an iodine thyrotoxicosis and partly the clinical and histologic differences between the two types of the disease. However, the difficulties attending a sharp differentiation of the two types, as well as a careful analysis of individual cases, compelled the author to give up the dualistic concept of thyrotoxicosis and assume instead that the differences in the clinical

picture of the two are rather to be explained by the age and constitution of the patient. The demonstration by Okkels of a hypertrophy of the Golgi apparatus characteristically present in all cases of thyrotoxicosis lends considerable support to the theory of nosologic identity of the two clinical pictures. The average duration of preoperative treatment with compound solution of iodine amounted to ten days. Debilitated patients were given, besides the solution, insulin, blood transfusions and intravenous dextrose. On the completion of the operation the patient was given 1,000 cc. of 5 per cent dextrose solution subcutaneously and the same amount by rectum, the latter with addition of 1.25 cc. of tincture of opium and 2 cc. of compound solution of iodine. Very sick patients and those with a severe post-operative reaction were given twice the amount, with the addition of 5 cc. of the compound solution of iodine in the intravenous dextrose infusion.

Zeitschrift f. d. ges. experimentelle Medizin, Berlin

104: 629-806 (Jan. 16) 1939. Partial Index

Determination of Hemoglobin in Spontaneous Diuresis. U. Schaare.—p. 656.

Influence of Feeding with Spleen and Liver on Number of Erythrocytes in Dogs in Which Anemia Has Been Induced by a Gallbladder Fistula. A. Zih.—p. 672.

Action of Creatine on Blood Sugar in Frogs. A. Lauari.—p. 679.

Behavior of Ketone Bodies in Experimental Impairment of Liver. G. Mikulicich and S. Markes.—p. 682.

Influence of Nicotine on Mineral Constituents of Blood: Calcium Content of Blood. L. H. Strauss and P. Scheer.—p. 691.

*Interrelations Between Insular Apparatus of Pancreas and the Gonads. Erna Hoffmann.—p. 721.

*Significance of Histamine and of Its Action as Cause of Late Death After Burns. E. Bernhard-Kreis.—p. 756.

Relation of Insular Apparatus of Pancreas to Gonads.

—Hoffmann states that clinical and experimental observations indicate that relations exist between the islands of Langerhans and the ovaries or testes. The glycosurias of pregnancy indicate interrelations between the insular apparatus of the pancreas and the ovaries. She reviews the relations of pancreatic disturbances to the genital functions in women and men, pointing out that diabetes may produce amenorrhea and atrophy of the ovaries and of the uterus. Moreover, diabetic women are frequently sterile. Diabetes in men is frequently accompanied by impotence; in fact, impotence often exists before the diabetes has been recognized. Atrophy of the testes and azoospermia result in some diabetic men. The author further reviews the literature on the pathologic-anatomic changes in the gonads of animals in which diabetes was artificially produced and in the insular apparatus of castrated animals. Since the reports about the effects of castration on the insular apparatus were contradictory, she made morphologic studies on male mice. Mature male mice were castrated and, after various lengths of time, the pancreases of these animals were compared with those of normal animals. Summarizing her observations, the author says that relations exist between the gonads and the insular apparatus of the pancreas because castration is followed by a considerable increase in the excretory tissue. The counting and measuring of the islands indicated that this increase of excretory tissue is the result of an enlargement of existing islands. A relative increase, by reduction of the excretory tissue, could be excluded on the basis of the counting and measuring of the islands. Compared to normal values, the increase in insular tissue amounts to approximately 80 per cent. Enlargement of the islands is accomplished by transformation of excretory tissue into insular tissue. From the fact that castration causes an enlargement of the islands it may be concluded that the gonads exert an inhibiting effect on the insular apparatus but that the pancreas, on the other hand, stimulates the gonads. Whether this mutual modification is direct or whether other organs, such as the hypophysis, intervene is a problem that remains to be solved.

Histamine and Late Deaths After Burns.—According to Bernhard-Kreis, the problem of the ultimate cause of death from burns, particularly of late death, has not been solved. Continuing earlier animal experiments on connections between the mechanism of anaphylactic shock and that of damage by heat, he found that, as regards the changes in the organs, former observations were corroborated. He observed that by the repeated injection of extracts from organs that have been damaged by heat it is possible to produce changes which greatly

resemble those which are produced by heat directly. Thus it can be concluded that there are no corroborating factors for direct connections between burns and anaphylaxis. The animals uniformly exhibit the signs of a steadily progressing cachexia no matter whether they have been treated with organic macerations that contained protein or with decoctions and roasting extracts that were free from protein but contained peptones and albumoses. The resulting organic changes are predominantly of the parenchymatous degenerative type; however, a comparison with those resulting from poisoning with pure solutions of histamine reveals that they cannot be ascribed to the fact that histamine acts in the extracts. In the organ extracts, particularly those from the skin and the musculature, the biologic methods of assay did not reveal the presence of histamine except in two unusual cases. This applies to the cold macerations of unchanged native organs as well as to the decoctions and roasting products. The action of these extracts and the action of the comparative processes in the living (scalding) is thus ascribed to roasting products and to peptones and albumoses. Action of histamine or of similarly acting substances (H-substances) must still be rejected.

Vestnik Khirurgii, Leningrad

56: 159-308 (Aug.) 1938. Partial Index

Resuscitation of Animals After Fatal Poisoning with Chloroform. I. P. Petrov and Z. I. Strukova.—p. 159.

*Utilization of Human Fat in Surgery. A. D. Kartavova.—p. 169.

Procaine Hydrochloride Block in Fractures of Ribs. L. M. Kapitsa.—p. 176.

Operative Approach to Tumors of the Occipital Fossa. I. S. Babchin.—p. 181.

Skin Temperature in Various Stimulations of Sympathetic Nervous System. A. I. Arutyunov and N. V. Semenov.—p. 188.

The Use of Human Fat in Surgery.—Kartavova calls attention to the fact that fat may act as a source of water in patients with disturbed water balance in addition to constituting the principal source of reserve energy of the organism. Utilization of fat for parenteral administration to patients unable to take nourishment by mouth has been attempted from time to time without definite results. The author reports her experiences with parenteral administration of human fat in fifty cases. The method of preparation is as follows: Fat obtained in the course of an operation is washed several times with cold water, cut up into small pieces and placed in an autoclave for from two to two and one-half hours, filtered through four thicknesses of gauze and sterilized by boiling. The resulting substance is a thick, yellow, odorless fluid with neutral reaction. Another source of fat is that taken from cadavers of persons dying suddenly. The average dose injected subcutaneously amounted to 50 cc. As much as 200 cc. could be administered without untoward effects. The injected fat is readily absorbed and produces no ill effects. It is indicated after resection of the stomach, in grave cases of peritonitis with continuous vomiting and in patients exhausted from suppurative disease.

Vrachebnoe Delo, Kharkov

20: 561-640 (No. 3) 1938. Partial Index

Effect of Antireticular Cytotoxic Vaccine on Healing of Fractures. O. A. Bogomolets.—p. 565.

Question of Capacity of Cells of Malignant Neoplasms for Differentiation. A. D. Timofeevskiy.—p. 569.

Alteration of Functional State of Active Mesenchyma in Allergy Growth of Malignant Neoplasms. Yu. A. Spasokukotskiy.—p. 581.

Metabolism and Physicochemical Characteristics of Malignant Tumors. E. Ya. Sterkin.—p. 593.

*Effect of Estrogenic Substance and Cholesterol on Growth of Neoplasms. I. M. Pysakhovich.—p. 603.

*Diagnosis of Cancer of Pancreas. V. M. Kogan-Yasnii and A. Ya. Altgausen.—p. 611.

Estrogen and Cholesterol in Growth of Neoplasms.—According to Pysakhovich, introduction of large amounts of cholesterol into the organism of an animal with experimental neoplasms (mice and rats) leads to an increase in the average weight and rate of growth of the neoplasm. The mechanism of this effect is bound up with factors having to do with hypercholesterolemia. He believes that lowering of the function of the reticulo-endothelial system, as a result of its partial blockade with cholesterol, is an important factor. Hyperestrogenization in mice and rats leads to a marked increase in the tendency to growth and the weight of all transplanted tumors. Structural

alterations in sex glands, resulting from long continued injections of large doses of endocrine preparations, bring about partial castration, thus creating conditions favoring activation of the growth of neoplastic new formations. Partial castration, in addition, causes a general alteration in the entire system of glands of internal secretion. The author did not observe a synergistic effect when the two substances cholesterol and estrogen were injected simultaneously. The two substances resemble each other in their ability to stimulate the growth of experimental neoplasms.

Cancer of the Pancreas.—Kogan-Yasniy and Altgausen emphasize the difficulty of diagnosis of cancer of the pancreas and its differential diagnosis from cancer of the liver, the biliary tracts and the duodenum and particularly from cancer of the papilla of Vater. The difficulty is due to the fact that the conditions mentioned present a number of similar symptoms, the principal of which is obstructive jaundice. Bergmann's statement that carcinoma of the papilla of Vater and of the duodenum can be diagnosed roentgenologically with considerable accuracy was not confirmed by their clinical experience. The authors emphasize that the determining factor in the differential diagnosis between cancer of the pancreas and cancer of the papilla of Vater is to be found in the functional disturbances of the pancreas. Glycosuria, which results from the invasion of the insular apparatus, is present in a considerable portion of the cases of pancreatic cancer. These cases are likewise characterized by rapid emaciation resulting from diminution of oxidizing processes and from inadequate assimilation of nourishment. Microscopic examination of feces reveals the absence or diminution of pancreatic ferments by the presence of neutral fat and undigested muscle fibers. In view of the fact that trypsin converts the amino acids leucine and tyrosine into indole, the quantitative determination of indican can serve as an accurate index of the excretory function of the pancreas. The authors cite several cases in which the determination of the internal and external pancreatic secretions made it possible to differentiate between carcinoma of the pancreas and that of the papilla of Vater. Their clinical experience gives support to an old statement of Leube that marked indicanuria speaks against cancer of the head of the pancreas.

Acta Medica Scandinavica, Stockholm

98:289-440 (Jan. 25) 1939. Partial Index

Hypertthyroidism and Treatment with Compound Solution of Iodine. J. Tillgren and N. Sundgren.—p. 289.

Some Experiments with Lymph Gland Material from Cases of Infectious Mononucleosis. P. J. Wising.—p. 328.

Relapsing Gastric Hemorrhages and Their Treatment. S. Hesser.—p. 340.

Familial Occurrence of Stenosis of Aortic Isthmus. E. Klemola.—p. 355.

Heparin and Sedimentation of Blood. K. N. von Kaulla.—p. 374.

Observations on Essential Thrombopenia (Morbus Maculosus Werlhofii). S. Heinild.—p. 385.

Sulfanilamide Treatment of Experimental Tuberculosis in Guinea Pigs. N. Levin.—p. 422.

Relapsing Gastric Hemorrhages and Their Treatment.

—Hesser says that acute gastric hemorrhage still presents many unsolved problems. During recent years it has attracted interest, principally owing to a certain new attitude in the matter of treatment. Surgeons have urged that operations should be performed in many of these cases during the acute stage, to prevent threatened death from loss of blood. Nevertheless, in medical circles conservative therapy is still recommended, especially since Holmgren and Meulengracht claimed that the prognosis had been materially improved by the abandonment of starvation diet and by giving food in a liquid or semisolid form in sufficient quantities from the beginning of the treatment for gastric ulcers. In view of the fact that bleeding gastric ulcers are a common complaint, the question of treatment is of great practical importance. In this paper the author gives his attention chiefly to the relapsing gastric hemorrhages, which, judging from his own experience, constitute a substantial proportion of the large group of acute gastric hemorrhages. Analyzing a material of 406 patients with gastric hemorrhages, he says that in 284 one hemorrhage occurred and that in 122 two or more hemorrhages occurred; that is, relapses occurred in about 30 per cent of the cases. Among the relapsing cases one relapse is

most usual (57 per cent) but two or more relapses are by no means unusual (up to twenty-two relapses in one case). The age of predilection for relapses is on the whole the same as for hemorrhages in general; that is, the frequency predominates in the ages between 30 and 60 years. In the matter of distribution by sex the same rule applies to relapses as to primary hemorrhages, namely that they are much more frequent in men than in women (more than twice as frequent). Regarding the anatomic situation of the ulcer, the author says that duodenal ulcers predominate considerably over ventricular ulcers (twice as frequent). Discussing the prognosis, he says that he observed four deaths in 122 cases of relapsing hemorrhage. The four patients who died were a man aged 84, a woman aged 79, a man aged 64 and a woman aged 41, which shows that, as in the case of primary hemorrhages, the more advanced ages seem most threatened. The author's material included thirty cases in which gastric operations were performed (gastro-enterostomy, and Billroth I and Billroth II) and gastric hemorrhages recurred once or more often. From this it appears that ventricular operations are by no means effective prophylactic measures against hemorrhages.

Essential Thrombopenia (Morbus Maculosus Werlhofii).—Heinild says that essential thrombopenia (idiopathic purpura with thrombocytopenia or hemorrhagic purpura) is a disease of unknown origin characterized by spontaneous hemorrhage of the skin and mucous membranes. Hematologic examination shows a great decrease in the number of blood platelets, absence or retardation of retraction of the clot, prolongation of the bleeding time and a decrease in the capillary resistance. The disease may have an acute or a chronic course. On the basis of the present status of knowledge on thrombopenic conditions, four groups can be differentiated: (1) essential thrombopenia, (2) symptomatic thrombopenia, (3) hyperergic thrombopenia and (4) hypersplenic thrombopenia. After giving the characteristics of these four groups the author reports and analyzes six cases of his own observation. He shows that the first case must be designated as a symptomatic thrombopenia of unknown origin. In this case the course of the disease was malignant, affecting chiefly the bone marrow and, as found at necropsy, toxic changes developed in the lymph glands. Cases 2, 3, 4 and 5 present aspects which closely correspond to the definition of chronic essential thrombopenia. Case 6 is of interest because it is one of those transitional cases which should be placed between the real forms of purpura without decrease in platelets (idiopathic purpura) and essential thrombopenia. The author thinks that the observations of several other investigators and his own investigations justify the theory that deficiency of the capillaries is constantly present and is of fundamental importance in this disease because its degree of severity coincides with the clinical manifestations. But of course it must be remembered that the constantly present symptom thrombopenia is of equal importance. It is of special interest that essential thrombopenia frequently appears at the time of the climacteric, that at this time of life a tendency to purpura has previously been proved experimentally, and that the so-called medicamentall allergic thrombopenia seems to have a predilection to appear at this period. Hence it is natural to suppose that disturbances in the endocrine balance also predispose to the development of so-called essential thrombopenia. In this publication it has been proved that the thrombopenic condition is not due to the cessation of the production of estrogen as such. Nor are endocrine variations the only predisposing causes, for the disease often appears in early childhood. This is a warning against the expectation of good results from the conventional treatment of thrombopenic conditions. It is evident that while symptomatic thrombopenia is frequently caused by fundamental disturbances in the hemopoietic system and hence beforehand renders any therapy unavailing, allergic thrombopenia on the other hand has a tendency to spontaneous recovery. The good effect of the splenectomy is indisputable and it seems due more to the improved function of the capillaries than to any increase in the number of platelets. There is no doubt that splenectomy would produce a good result in cases 2, 3, 4 and 5. The present examination, however, does show that conservative treatment, when consistently effected, may cause a considerable improvement in the function of the capillaries. It will be a problem for the future to elucidate the origin of essential thrombopenia.



Rock Pleyster

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ANGINA PECTORIS AND CARDIAC INFARCTION FROM TRAUMA OR UNUSUAL EFFORT

WITH A CONSIDERATION OF CERTAIN
MEDICOLEGAL ASPECTS

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Can a nonpenetrating injury to the chest or severe bodily effort directly provoke cardiac infarction or lead to changes in the heart that give rise to the syndrome of angina pectoris? This question, arising so frequently in connection with claims under workmen's compensation acts, has not yet been satisfactorily answered. The preponderant opinion at present seems to be that trauma and effort so rarely precede the onset of coronary thrombosis that their association is just coincidental. This thesis has been particularly elaborated by Master and his associates.¹ They have analyzed the events attending 530 attacks of coronary thrombosis. They find that 22 per cent of attacks occur when the patient is at rest, 20 per cent while he is asleep, 18 per cent while he is walking, 14 per cent during mild activity and 5 per cent during moderate activity. They point out that since half of the day of normal persons is spent in mild or moderate activity, one might well expect that half of all attacks of coronary thrombosis would occur during this period. The fact that 36.9 per cent of attacks occurred during such mild activity therefore is interpreted as a mere temporal, not a causal, association. Only 2 per cent of the attacks followed unusual exertion, and 5 per cent followed excitement. On the basis of this low incidence of coronary thrombosis following unusual stress the authors conclude that in such cases the association of the stress and the vascular occlusion is only accidental. Coronary thrombosis following operation was encountered in 4 per cent of their series. In this instance, however, the authors do not apply the criteria of probability employed in their discussion of the effect of exertion on coronary thrombosis but on general grounds conclude that operation is a factor that may initiate coronary thrombosis.²

These deductions are inconsistent. I fully agree with Master that coronary thrombosis very often occurs while the individual is at rest or asleep and that in many cases no antecedent injury or effort has taken place. But to argue from this that such accidents are not

competent causes of coronary thrombosis appears incorrect. The fact that pneumothorax is due usually to pulmonary tuberculosis or to the rupture of an emphysematous bleb does not negate the fact that it may follow trauma to the chest; or that cerebral hemorrhage is caused usually by disease of the cerebral arteries that it may not be due to trauma to the head.

In my experience trauma or bodily effort may directly induce closure of a coronary artery with cardiac infarction or may initiate the syndrome of angina pectoris. This occurs with sufficient frequency to be of practical clinical importance as well as of medicolegal significance. I propose in this paper to present evidence from the literature as well as from my personal experience that injuries to the chest or severe effort may produce signs and symptoms of injury or impairment of the coronary arterial circulation.

TRAUMATIC NONPENETRATING INJURIES OF THE HEART

Many cases of injury to the myocardium following nonpenetrating injuries to the chest have been observed at necropsy and reported in the literature. In Warburg's³ recent monograph 174 instances of myocardial lesions due to nonpenetrating traumatic injuries to the chest are abstracted from the literature. To these he adds thirteen new cases of his own. Many types of myocardial injury are described, ranging from rupture of one of the cardiac chambers to scattered small myocardial hemorrhages. In a number of the cases in his series, as well as in others not included in his book, damage to the coronary arteries or the anginal syndrome has been observed after this type of injury. A few such cases will be briefly cited.

A man aged 45, struck in the precordium by a wagon shaft, was unconscious for several minutes and when consciousness returned complained of severe pain in the chest, back, left shoulder and left arm.⁴ Physical examination revealed no cardiac abnormalities. The patient continued to suffer from cardiac pain, which came particularly when he was active and which prevented him from climbing stairs. He died suddenly six months after the accident. At necropsy organized thrombi were found in the anterior descending branch of the left and in the circumflex branch of the right coronary artery. The myocardium was scarred and there was an aneurysm of the left ventricle at the apex. There was advanced arteriosclerosis of the descending aorta between the aortic isthmus and the diaphragm.

A boy aged 12 years was run over by a wagon and six ribs of the left side of the chest were fractured.⁵ After recovery from the accident the boy was apparently well for twelve years, except

1. Master, A. M.; Dack, Simon, and Jaffe, H. L.: Factors and Events Associated with Onset of Coronary Artery Thrombosis, *J. A. M. A.* 109: 546 (Aug. 21) 1937.

2. Master, A. M.; Dack, Simon, and Jaffe, H. L.: Postoperative Coronary Occlusion, *J. A. M. A.* 110: 1415 (April 30) 1938.

3. Warburg, Erik: Subacute and Chronic Pericardial and Myocardial Lesions Due to Non-Penetrating Traumatic Injuries, New York, Oxford University Press, 1938.

4. Schmincke, A.: Beitr. z. traumatischen Aetiologie d. Arteriosclerose, *Deutsches Arch. f. klin. Med.* 149: 145 (Dec.) 1925.

5. Joachim, H., and Mays, A. T.: A Case of Cardiac Aneurysm Probably of Traumatic Origin, *Am. Heart J.* 2: 682 (Aug.) 1927.

for occasional attacks of palpitation and vomiting. At the age of 24 he began having attacks of paroxysmal auricular flutter, some of which lasted as long as a week. Heart failure developed in some of the attacks. He died suddenly at the age of 25. Necropsy revealed an aneurysm of the anterior aspect of the left ventricle. The anterior descending branch of the left coronary artery stopped abruptly at the upper edge of the aneurysm. The authors concluded that it had been destroyed by the trauma thirteen years previously.

A man aged 40 who had been perfectly well fell on his back while skiing.⁶ When he arose he felt nauseated, but he kept on. A quarter of an hour later he collapsed, vomited and complained of severe precordial pressure and *angor animi*. The pulse was irregular, the heart sounds faint and the blood pressure 95 systolic, 55 diastolic. In a short time the liver became enlarged. Fever and leukocytosis followed. An electrocardiogram taken twenty-four hours after the fall showed a high take-off of the T waves in leads 2 and 3. A subsequent electrocardiogram showed a typical Q-T_s pattern.

A man aged 57, who was accidentally struck over the precordium by a golf ball, was in a state of shock for fifteen minutes but gradually recovered, so that he was able to attend to his business the following two days.⁷ On the night of the third day there was an attack of angina pectoris, with electrocardiographic evidence of cardiac infarction. Prior to the injury there had been no symptoms of coronary disease.

Bean⁸ described three cases of coronary thrombosis following trauma. Beck⁹ as well as Munck¹⁰ has described contusions of the heart with hemorrhage into the myocardium, verified at necropsy.

Experimental studies have confirmed these clinical observations. Kissane, Fidler and Koons¹¹ struck blows on the chests of anesthetized dogs. Electrocardiographic abnormalities, especially changes in the RT segments, were observed. Pathologic studies revealed subendocardial and subpericardial hemorrhages. In three cases in which the electrocardiograms were abnormal, no lesions were discovered. The most complete studies are those of Schlomka.¹² Most of the experiments were carried out on rabbits and cats; in two cases dogs were used. The precordium was struck with blows of moderate intensity. Rarely was the blow sufficiently strong to cause rupture of the heart or death. Frequent electrocardiograms were taken. Characteristic and common observations were sinus bradycardia (even when the vagus had previously been cut), extrasystoles, ventricular tachycardia, ventricular fibrillation, auricular fibrillation and partial and complete heart block. In many instances typical "coronary" T waves, with high take-offs, were encountered. X-ray studies usually revealed cardiac dilatation. In many cases the electrocardiographic changes rapidly returned to normal; in not a few there was permanent cardiac damage, manifested by persistent electrocardiographic changes and cardiac enlargement. Cardiac abnormalities occurred particularly when the precordium itself was struck; injuries to other parts of the chest rarely produced cardiac damage. T wave changes occurred

with particular frequency from a quick sharp blow with a small object concentrated in a small area, particularly directly over the sternum or the apex. Pathologic changes were chiefly focal myocardial hemorrhages. In some animals who succumbed to the trauma no anatomic lesions were discovered. Some of the rabbits used had previously been sensitized to horse serum. In these, anemic infarcts of the myocardium were very common. From his own studies and from a review of the clinical, physiologic and pathologic literature Schlomka concluded that blows sharply localized to the precordial area produce a spasm of the coronary arteries and that, depending on the duration of the ischemia, the changes in the myocardium may be reversible or irreversible. The coronary arteries themselves may be injured by the ischemia so that permanent damage to these vessels may ensue. He drew a parallel between such coronary spasms and the segmental arterial spasm observed in the case of gunshot wounds that penetrate the tissues near arteries of the extremities. Arterial spasm following arterial embolism may offer an analogous phenomenon.

Kohn¹³ was the first to describe the syndrome of traumatic angina pectoris. Careful students of the subject such as Warburg,³ Schlomka,¹² Beck⁹ and Barber¹⁴ all agree that symptoms of angina pectoris may be initiated by traumatic nonpenetrating injuries to the chest in the precordial region. I entertain the same conviction. The following case, which I observed, offers convincing evidence of the validity of this conclusion:

CASE 1.—A man aged 62, who had worked for seventeen years as a plumber, doing heavy work, carrying bathtubs into buildings and the like, without any symptoms whatever, was cleaning a sewer pipe, Nov. 7, 1935, which had become blocked. For this work a heavy cable was fed into the sewer by one man and extracted on the other side by the patient. The cable was new and had considerable spring. The patient was winding the cable into a coil on the receiving end when it suddenly sprang and struck him with considerable force in the left lower part of the chest. He was stunned. Things became dark before his eyes and he had to remain leaning against the wall for half an hour. Then with some effort he finished the job but went to the feeding end of the cable, where the work is lighter. He managed to work slowly and intermittently for the rest of the day. In the afternoon local pain and swelling appeared on his chest where he was struck, and when he returned home his wife remarked that his face looked pale and drawn. The next morning he returned to work, but slight effort, such as using a wrench, provoked pain in the precordium, compelling him to rest every half hour or so. On this day and on the following days he noted increasing difficulty in walking, so that by the fourth day he was compelled to stop, after walking five blocks, by a sense of choking in the left side of the chest, which radiated to the left side of the neck. He continued to work with difficulty for ten days. November 25 he experienced precordial pain which became progressively more severe, which lasted all night and for which he was given a hypodermic injection of morphine. He remained in bed eight weeks after this attack. Ever since he has had angina pectoris on effort. Fluoroscopic examination June 24, 1938, revealed much enlargement of the left ventricle. The first heart sound was of good quality. There was a systolic murmur at the apex. The blood pressure was 110 systolic, 80 diastolic. The electrocardiogram showed low voltage and slurring of the QRS complex in all leads, a Q wave and a flat T wave in lead 1, and a large Q wave and negative T wave in lead 4.

6. Kienle, F.: Klinische und elektrokardiographische Beobachtungen bei traumatischem Hinterwandinfarkt, *Ztschr. f. Kreislaufforsch.* 30: 674 (Sept. 15) 1938.

7. Relation of Myocarditis and Coronary Thrombosis to Trauma, *Queries and Minor Notes*, J. A. M. A. 101: 1503 (Nov. 4) 1933.

8. Bean, W. B.: Infarction of the Heart, a Morphological and Clinical Appraisal of 300 Cases: I. Predisposing and Precipitating Conditions, *Am. Heart J.* 14: 684 (Dec.) 1937.

9. Bright, E. F., and Beck, C. S.: Nonpenetrating Wounds of the Heart, *Am. Heart J.* 10: 293 (Feb.) 1935. Beck, C. S.: Contusions of the Heart, J. A. M. A. 104: 109 (Jan. 12) 1935.

10. Munck, Willy: Investigations on Heart Lesions Due to Blunt Force, *Hospitalstid.* 80: 525 (May 11) 1937.

11. Kissane, R. W.; Fidler, R. S., and Koons, R. A.: Electrocardiographic Changes Following External Chest Injuries to Dogs, *Ann. Int. Med.* 11: 907 (Dec.) 1938.

12. Schlomka, I.: Commotio Cordis und ihre Folgen, *Ergebn. d. inn. Med. u. Kinderh.* 17: 1, 1934.

13. Kohn, H.: Angina Pectoris und Unfall, *Klin. Wchnschr.* 8: 795 (April 23), 843 (April 30) 1929.

14. Barber, Hugh: Trauma of the Heart, *Brit. M. J.* 1: 433 (Feb. 26) 1938.

CORONARY OCCLUSION OR ANGINA PECTORIS
INDUCED BY SEVERE OR UNUSUAL
BODILY EFFORT

Ever since Kohn in 1929 set up the syndrome of angina pectoris traumatica there have been repeated references in the literature to coronary artery occlusion following severe bodily effort. Fitzhugh and Hamilton¹⁵ described many cases of coronary thrombosis following unusual or violent physical exertion and concluded that the effort induced the arterial occlusion. In their experience "more often than not fatal anginas or coronary occlusions were immediately preceded by unusual departures from ordinary habits of living."

Kampmann¹⁶ described the case of a man aged 43 who was pulled to the ground violently when the crank handle of a bus that he was cranking kicked back. Immediately he felt sharp precordial pain and became dizzy. He was able to drive a little farther but half an hour after the accident vomited and experienced severe precordial pain, broke out in a cold sweat and became pulseless and cyanotic. He slowly improved. The following day his heart rate was 32. In the subsequent eight days it rose slowly to 60, but he had a number of attacks of Stokes-Adams syncope. Two years later he still had precordial pain on exertion. The heart sounds were faint; the electrocardiogram showed a Q_3 - T_3 pattern and a PR interval of 0.21 second. This man experienced an infarction of the posterior aspect of his left ventricle after the accident and with this a complete heart block. The author referred to other reported cases of traumatic heart block.

Phipps,¹⁷ without giving detailed clinical histories that make possible a critical evaluation of his data, reported that in 40 per cent of cases coronary thrombosis occurred under conditions of physical stress and that in 13 per cent it occurred during exercise. Luten¹⁸ found effort rarely associated with coronary thrombosis, but it is chiefly Master who denies that effort is a competent producing cause of coronary thrombosis.

Bean and Mills¹⁹ in a recent study of 1,640 attacks of coronary occlusion found that in northern cities these attacks occur with much greater frequency in winter than in summer. There were twice as many attacks in January as in August. They conclude that the greater frequency of infections and the heightened metabolism in cold weather increase the work of the heart and so add to the hazards to which these patients are exposed.

I have examined and studied twenty-five patients in whom coronary occlusion appears to have been directly induced by severe or unusual exertion. The following cases illustrate this sequence:

CASE 2.—I. R., a man aged 47, seen July 27, 1937, had known for about a year that his blood pressure ranged between 150 and 160. He had, however, felt quite well except for headaches and had worked hard as a painter without symptoms. July 6, while lifting an 85 pound can of paint, he experienced sudden pain in the left arm and in both jaws. He dropped the can and in a few moments felt well. Five hours later, while he was rolling a barrel up an incline, he experienced some pain in the left arm

and jaw, as well as in the midchest. The pain became very severe, lasted eight hours and was associated with a sense of choking. He remained in bed for three weeks, until the time of his examination. He was a well built man. Fluoroscopic examination revealed slight enlargement of the left ventricle. The heart sounds were of good quality. There were no murmurs. The blood pressure was 130 systolic, 80 diastolic. The electrocardiogram showed Q waves and sharply negative T waves in leads 2 and 3. He was again seen two months later. He had no symptoms, but the blood pressure had risen to 160 systolic and 100 diastolic. He was awarded compensation under the workmen's compensation law of New York State.

CASE 3.—M. S., a man aged 53, who had always been perfectly well and strong and had no knowledge of previous heart disease or high blood pressure, at about 9:30 a. m. May 22, 1937, lifted a roll of pattern paper, weighing 180 pounds, in order to place it on a table. He experienced sudden sharp and pressing pain in the left lower part of the chest, which radiated to the back of the left side of the chest. For a few minutes he was unable to catch his breath and unable to straighten up. Then he coughed up a small amount of blood with some relief. He immediately stopped work and was driven home by a friend. Severe pain continued throughout the day, in spite of the fact that he received a number of hypodermic injections. An electrocardiogram taken May 24 showed an elevation of the RT segment in leads 1 and 2, a marked depression of the RT segment, a negative T wave and a deep Q wave in lead 4. May 27 he was taken to the Manhattan General Hospital, where he stayed until July 12. Here a diagnosis of coronary thrombosis was made. An electrocardiogram taken July 12 showed negative cove plane T waves in leads 1 and 2; very low voltage in all leads, Q waves in leads 2 and 3 and a negative T wave and a Q wave in lead 4. August 22 he was admitted to the Israel-Zion Hospital, complaining of shortness of breath and precordial pain, and remained in this hospital until October 14. Here a diagnosis of left ventricular insufficiency was made in addition to that of coronary thrombosis. He has been in bed most of the time since then. When he attempts to walk he experiences precordial pain and pain in the back which compel him to rest. Bending too provokes such pain. Sept. 20, 1938, fluoroscopic and x-ray examination revealed marked generalized dilatation of the aorta and a great enlargement of the heart, involving chiefly the left ventricle and auricle. Along the lower half of the left border of the heart there was a marked bulge, which on fluoroscopic examination showed practically no pulsation. On the x-ray film one saw marking the edge of this bulge a crescentic shadow, which apparently represented calcification. The heart sounds were feeble. There were no murmurs. The blood pressure was 130 systolic, 90 diastolic. The electrocardiogram showed low voltage in all leads, Q waves in leads 1, 2 and 4, an elevated RT segment, a negative T wave in leads 1 and 4 and a W shaped QRS complex in leads 2 and 3.

CASE 4.—S. N., a man aged 44, first observed April 2, 1937, had had occasional attacks of midabdominal cramps three years previously unrelated to meals. At that time he was unable to walk or climb stairs as readily as formerly, because he became tired and slightly dyspneic. After a few months these symptoms disappeared, but they recurred in January 1937. A gastrointestinal x-ray series suggested the presence of a peptic ulcer. In March he noted a heaviness in his chest, which was persistent but was not intensified by excitement. March 29, while lifting a 50 pound package, he experienced severe substernal pain, was unable to catch his breath and collapsed. The pain lasted about fifteen minutes. He went home by subway, stayed in bed for one day and had no further pain. He was seen four days after the accident. Fluoroscopic examination revealed a heart of normal size and configuration. The heart sounds were dull. There were no murmurs. The blood pressure was 190 systolic, 60 diastolic. The electrocardiogram showed elevation of the RT segment in leads 1, 2 and 4. An electrocardiogram taken April 16 showed a diphasic T wave in lead 1, a depressed RT segment in leads 2 and 3 and an elevated RT segment in lead 4. He was seen at intervals during the following one and a half years, and during this time no additional symptoms developed. He applied for compensation under the workmen's compensation act of New York state but his claim was disallowed.

15. Fitzhugh, Greene, and Hamilton, B. E.: Coronary Occlusion and Fatal Angina Pectoris: Study of the Immediate Causes and Their Prevention, *J. A. M. A.* 100:475 (Feb. 18) 1933.

16. Kampmann, Werner: Ein Fall von isolierter Verletzung des Herzkreislaufsystems, *München. med. Wchnschr.* 82:129 (Jan. 24) 1935.

17. Phipps, Cadis: Contributory Causes of Coronary Thrombosis, *J. A. M. A.* 106:761 (March 7) 1936.

18. Luten, Dreyer: Contributory Factors in Coronary Occlusion, *Am. Heart J.* 7:36 (Oct.) 1931.

19. Bean, W. B., and Mills, C. A.: Coronary Occlusion, Heart Failure and Environmental Temperatures, *Am. Heart J.* 16:701 (Dec.) 1938.

CASE 5.—S. S., a man aged 49, first observed Nov. 18, 1935, had been perfectly well until three weeks previously, when, while carrying a 60 pound package up one flight from the cellar, he experienced substernal pressure, which lasted about five minutes. This was unassociated with sweating. He continued work but from that time on noted that on working too hard or on walking three blocks he would experience substernal pressure and pain, which would compel him to stop his activities. He was well built. Fluoroscopic examination revealed a heart of normal size and configuration. The first heart sound was split. There were no murmurs. The blood pressure was 130 systolic, 90 diastolic. The electrocardiogram was normal except for a very low T wave in lead 4. He was seen again in February 1936; the symptoms were unchanged. The T wave in lead 4 was now of normal size. He was last seen Nov. 20, 1936. His anginal symptoms persisted.

CASE 6.—H. T. in 1926, when he was 35 years old, was driving a new truck and the motor stalled. He had to crank the engine. This took some time and effort because the motor was new. When he got back into his seat and began to drive away, he experienced pain in the region of the left elbow and some distress in the left side of the chest and had difficulty in catching his breath. He was compelled to stop the truck and get out and walk to the nearest subway station. The original elbow pain stopped after about two minutes but recurred as he walked and compelled him to make his way slowly. He then rested for five weeks and felt quite well until 1936. He had changed to a lighter occupation. In 1936 he began to experience substernal pressure and difficulty in breathing on walking a few blocks, compelling him to rest. These symptoms have continued. I examined him in May 1938. Fluoroscopic examination revealed a transverse heart of normal size. The first heart sound was a bit dull. There were no murmurs. The blood pressure was 140 systolic, 90 diastolic. The electrocardiogram was normal. He was seen again in October 1938. The symptoms of angina pectoris had persisted, but there had been no prolonged attacks of pain. Physical examination disclosed no new developments, but the electrocardiogram now showed a depressed RT segment in lead 1 and a sharply negative T wave in lead 4.

CASE 7.—P. L., a man aged 43, who had worked at his occupation as a painter without any symptoms whatever until July 12, 1937, on this day started work an hour late and rushed to catch up. He was sizing some partitions with a sponge and working very fast. After forty-five minutes he began to sweat and became dizzy. He then experienced a tearing pain to the left of the sternum, which was followed by a constricting sensation, and broke out into a cold sweat. Hypodermic medication was given and he was taken to a hospital, where he stayed for four weeks and where an electrocardiogram showing infarction of the left ventricle was obtained. After discharge from the hospital he still had frequent precordial pain, unrelated to exertion, although greater exertion caused some difficulty in breathing. He was, however, able to resume his work. Fluoroscopic examination September 28 revealed slight enlargement of the left ventricle and some dilatation and elongation of the aorta. The heart sounds were of good quality. There were no murmurs. The blood pressure was 120 systolic, 70 diastolic. The electrocardiogram showed a flat T wave in lead 2 and a sharply negative T wave in lead 3. He applied for compensation under the workmen's compensation laws of New York state, but his claim was disallowed.

CASE 8.—J. B., a man aged 48, first observed Dec. 22, 1936, had had an attack of pressure in the upper part of the abdomen, sweating and collapse five weeks previously, which lasted for ten minutes. He was in bed for ten days and had no recurrence of the pain. He was then well and was working as a hotel keeper. December 20 he had an argument with two drunken men and threw them downstairs and immediately afterward dragged a drunken woman up two flights of stairs. When he reached the top of the stairs he broke out into a cold sweat and was unable to move. He then experienced substernal pain and difficulty in breathing. He was seen two days after this occurrence. He was febrile and appeared ill. There were a few rales at the bases of the lungs. The heart sounds were feeble. The heart rate was rapid. He was seen subsequently on March 25, 1937. Fluoroscopic examination revealed much enlargement of the left ventricle and some enlargement of the left auricle. The first

heart sound was faint. The pulmonic second sound was accentuated. There were no murmurs. The blood pressure was 90 systolic, 60 diastolic. The electrocardiogram showed low voltage and slurring of the QRS complex in all leads and Q waves and negative T waves in leads 1 and 4.

CASE 9.—B. S., a man aged 55, first seen in February 1938, was suddenly seized nine years previously, while dancing after a wedding dinner, with substernal pressure which developed into severe pain and was associated with cold sweat. The pain lasted about four hours and was relieved by hypodermic medication. He was in bed for eight weeks. Ever since, walking two blocks would provoke substernal pressure, compelling him to rest. During the three months prior to his present examination, anginal attacks would come on at rest and there had been a number of attacks of paroxysmal dyspnea. Physical examination revealed a few rales at the bases of both lungs. Fluoroscopic examination revealed great enlargement of the left ventricle and of the left auricle. The first heart sound was quite faint and split. The second sound at the apex was reduplicated. There was a systolic murmur at the apex. The blood pressure was 115 systolic, 70 diastolic. The electrocardiogram revealed bundle branch block.

CASE 10.—M. E., a man aged 47, first observed in December 1934, for several years had had some heartburn after eating but was otherwise well. Eleven weeks previously, during intercourse, he experienced pressing pain to the left of the sternum, which radiated down the left arm, and he broke out into a cold sweat. The pain lasted about fifteen minutes and was relieved by a hypodermic injection. He went to work the next day; he again broke out into a cold sweat, feared that another attack was coming on and went to a hospital, where he stayed for four weeks. After discharge from the hospital he noted that walking six blocks or so during cold weather would provoke substernal pressure which compelled him to stop. Fluoroscopic examination revealed some enlargement of the left ventricle. The first heart sound was dull. Both basic second sounds were accentuated. There was a systolic murmur at the aortic area. The blood pressure was 110 systolic, 80 diastolic. The electrocardiogram showed an elevated RT segment with a diphasic T wave and a Q wave in lead 1, a slightly depressed RT segment with a diphasic T wave in lead 3 and a deep Q wave and a negative T wave in lead 4. He was seen again in December 1937, still complaining of angina pectoris on exertion. The electrocardiogram now showed a sharply negative T wave in lead 1, and the T wave in lead 4 had become positive.

CASE 11.—A. N., a man aged 47, who had in July 1930 experienced slight distress in the lower anterior part of the chest while playing ball, would stop when experiencing pain. Oct. 18, 1937, while playing football, he experienced sudden pain in the anterior part of the chest, as though he were in a vice, and broke out into a cold sweat. Severe pain lasted one-half hour and milder pain lasted for two days. The following day his temperature rose to 101 F. He stayed in bed for six days. After this he noted that walking or climbing stairs would provoke substernal pain, compelling him to rest. He was a stockily built man. Fluoroscopic examination October 28 revealed moderate enlargement of the left ventricle and left auricle. The first heart sound was dull. There were no murmurs. The blood pressure was 110 systolic, 70 diastolic. The electrocardiogram showed slurring of the QRS complex and Q waves and sharply negative T waves in leads 2 and 3.

CASE 12.—I. D., a man aged 49, who had been complaining for one and a half years of epigastric burning one or two hours after meals, relieved by sodium bicarbonate or milk, occasionally was awakened at night by this pain. Jan. 18, 1936, while trudging through a heavy snowfall on a very cold day, he began to experience cramplike pain behind the sternum, which radiated to the left upper extremity. He began to sweat. The pain slowly became worse, and he returned home and was given a hypodermic injection a few hours later. Intermittent pain continued for two days and he remained in bed for two weeks. He was seen February 8. He was a stout man of high color. Fluoroscopic examination revealed a heart of normal size and configuration. The heart sounds were of good quality. There were no murmurs. The blood pressure was 135 systolic, 80 diastolic. The

electrocardiogram showed a small Q wave and a low T wave in lead 1 and a deep Q wave and sharply negative T wave in lead 4.

CASE 13.—M. B., a man aged 45, had had a very hard day Sept. 21, 1938, delivering furniture. It was raining heavily and he was wet to the skin. Indeed the weather was so inclement that the driver of the furniture truck telephoned his employer a number of times asking for permission to postpone deliveries to another day, but permission was refused. Toward the end of the day, while the patient was carrying a chiffon robe up a second flight of stairs and while he was lifting it high over the banister to make a turn at the landing, he suddenly felt as though something had snapped behind the lower part of the sternum. This was immediately followed by severe pressure across the lower part of the chest, which radiated to the lower pectoral area. He made his way down the stairs, collapsed and was unconscious for four hours. He was taken to a hospital, where he remained for six weeks. After his discharge from the hospital, walking five blocks always provoked sharp parasternal pain on the left, which radiated to the back and which compelled him to rest. Fluoroscopic examination December 30 revealed slight enlargement of both ventricles. The heart sounds were dull. There were no murmurs. The blood pressure was 95 systolic, 70 diastolic. The electrocardiogram had a very low T wave in lead 1 and a Q wave and negative T wave in lead 4.

CASE 14.—S. S., first observed in August 1930, when he was 58, at that time had no symptoms referable to the heart. He had an old tuberculous lesion at both apexes. The left ventricle was slightly enlarged and the aorta a bit dilated and dense. The heart sounds were of good quality. The blood pressure was 160 systolic, 100 diastolic. The electrocardiogram showed only left axis deviation and low voltage. In November 1934 he began to experience substernal pressure and epigastric pain while at work and while walking. The pain would compel him to rest. Feb. 22, 1935, while walking to work during a blizzard, he experienced severe substernal pressure and great weakness. Nevertheless he went to his shop and went to work, and four hours later, while lifting a heavy machine, he became very weak, broke out into a profuse sweat and fainted. Fluoroscopic examination four days later, February 26, revealed that the heart was of the vertical type and not enlarged. The heart sounds were of good quality. There was a systolic murmur at the apex. The blood pressure was 140 systolic, 80 diastolic. The electrocardiogram showed a depressed RT segment, with a diphasic T wave in lead 2 and a Q wave and sharply negative T wave in lead 3. Angina pectoris on slight exertion persisted. He applied for compensation under the workmen's compensation laws of New York State. This case differs from the others in that the symptoms suggesting coronary thrombosis occurred four hours before he went to work and were apparently precipitated by the effort of walking in a snow storm. The final collapse occurred when he overexerted himself four hours after the beginning of the symptoms of coronary thrombosis. In this case the exertion of walking in the snow storm rather than the lifting of a heavy machine must be regarded as the cause of the coronary thrombosis.

These clinical observations, together with those of other authors, warrant the conclusion that the syndrome of coronary occlusion may be induced by a non-penetrating injury to the chest or by unusual effort and that the same causes may initiate the syndrome of angina pectoris. The reluctance of many clinicians to accept a causal relationship between these phenomena is due in part to the fact that when an injury occurs during work the patient naturally seeks to establish that the work as such was responsible for his disability. He may wittingly or unwittingly construct a logical series of events leading up to his injury. There is a universal tendency among patients to ascribe their illnesses to some concrete indiscretion or accident. Of the fourteen cases that I have presented, only five involved a problem of workmen's compensation. In

the others the patient had nothing to gain by ascribing his illness to an unusual effort.

Inability to visualize the mechanism by which lesions of the coronary arteries may be induced by trauma or by bodily effort has further retarded the acceptance of a causal relationship between these events. Recent pathologic studies throw some light on this problem. The manner in which nonpenetrating injuries of the chest can cause myocardial damage has been discussed, and experimental and postmortem evidence has been presented to prove that such traumatic lesions of the heart actually occur.

The way in which unusual bodily effort or strain can induce acute changes in the coronary arteries and in the coronary circulation is suggested by several anatomic studies. Leary²⁰ states that rupture of an atheromatous cavity of the wall of a coronary artery into the lumen is the standard terminal lesion in older persons dying of coronary thrombosis.

Paterson²¹ has studied intimal hemorrhages of the coronary arteries, which are due apparently to rupture of capillaries in the arterial wall. Such intimal hemorrhages are commonly found in recently thrombosed coronary arteries. His studies suggest that capillary rupture and intimal hemorrhage are closely concerned with the formation of most coronary thrombi. Thrombosis in the lumen of a coronary artery may be initiated by diffusion of blood from an intimal hemorrhage into the lumen, by necrosis of the intima or by retrograde capillary thrombosis. Paterson points out that during periods of physical stress a rise in pressure in the capillaries of the intima may occur, causing their rupture. Complete closure of a coronary artery by a thrombus may occur hours or days after the original capillary hemorrhage.

Winternitz²² has demonstrated the rich capillary network that is found in the arterial wall, particularly in the neighborhood of sclerotic areas, and has shown that hemorrhages into the intima are frequently the precipitating factors in arterial thrombosis.

Wartman²³ has described six cases of complete occlusion of a sclerotic coronary artery by a large hemorrhage into its wall. In one of these cases an intra-arterial thrombus was associated with the intramural hemorrhage. In all cases death was caused by the hemorrhagic arterial occlusion. Winternitz²² observed similar cases.

These anatomic studies suggest how unusual exertion may bring about coronary artery occlusion. With physical effort there is a sudden alteration of arterial pressure, cardiac action is increased, rupture of one of the capillaries or sinusoids in the arterial wall may occur, or a softened atheromatous plaque may rupture into the arterial lumen. If the hemorrhage is large there may be almost immediate occlusion of a coronary artery; if the hemorrhage is small or slow or if it is followed by a gradually growing mural thrombus the occlusion may develop slowly or remain incomplete. Thus the concept of coronary occlusion and of angina pectoris induced by physical exertion established by

20. Leary, Timothy: Coronary Spasm as a Possible Factor in Producing Sudden Death, *Am. Heart J.* 10: 338 (Feb.) 1935.

21. Paterson, J. C.: Capillary Rupture with Intimal Hemorrhage as a Causative Factor in Coronary Thrombosis, *Arch. Path.* 25: 474 (April) 1938. Paterson, J. C.: Relation of Physical Exertion and Emotion to Precipitation of Coronary Thrombi, *J. A. M. A.* 112: 895 (March 11) 1939.

22. Winternitz, M. C.; Thomas, R. M., and LeCompte, P. M.: *The Biology of Arteriosclerosis*, Springfield, Ill., Charles C. Thomas, Publisher, 1938.

23. Wartman, W. B.: Occlusion of Coronary Arteries by Hemorrhage into Their Walls, *Am. Heart J.* 15: 459 (April) 1938.

discriminating clinical observation finds support and confirmation in dissections of diseased arteries. It follows that when symptoms of coronary artery disease are induced by physical strain, even when the patient has had no preceding symptoms, there have most likely been antecedent anatomic lesions of the coronary arteries. When such symptoms follow nonpenetrating blows to the precordium no such preexisting arterial disease need be predicated.

CRITERIA FOR DIAGNOSIS

These cases often give rise to legal issues, in particular in connection with workmen's compensation acts. The question arises whether the particular injury or effort was a competent producing cause of the symptoms. This can be answered only by a careful evaluation of the succession of events in each individual case, with due recognition of the fact that patients tend to ascribe their illnesses to some unusual experience which actually may have no significance.

When trauma or effort damages the heart, cardiac symptoms, with rare exceptions, develop almost immediately. Precordial pain or breathlessness or both are common and compel the patient to stop whatever he is doing. There may be dizziness, fainting or shock, but these signs may be missing. Complete collapse need not occur and often, after a short rest, the patient is able to carry on for a while or is able to make his own way home. Immediate examination of the heart may not reveal any significant abnormalities. Warburg³ reported that "fifteen of the fifty-one indubitable cases that were examined post mortem did not immediately after the trauma present such symptoms that there was reason to presume that the heart had been injured."

There is considerable variation in the time that elapses before the full symptoms and incapacity develop. In many instances extensive cardiac damage occurs immediately after the accident or follows within a few hours. In others there is a free interval of many hours or even of several days between the accident and the development of major cardiac damage, and during this interim the patient may complain of little beyond weakness and some uneasiness in the chest. In still other cases there are continuous symptoms of minor cardiac embarrassment after the accident, but these may not be severe enough to incapacitate the patient. Finally after days or even weeks a complete coronary occlusion occurs, leading to complete disability. Case 1 of my series is a good illustration of this sequence. Immediately on receiving the injury the patient had to rest for a while and then continued to work with difficulty. During the following ten days there developed progressively more severe symptoms of angina pectoris, but he still remained at work. Finally, on the eighteenth day after the accident, coronary thrombosis developed, causing him to remain bedridden for eight weeks. Although the major disablement was delayed eighteen days, there was a continuous train of symptoms between the time of the accident and the coronary occlusion.

To relate an accident or an unusual effort to a subsequent coronary thrombosis or syndrome of angina pectoris one must predicate cardiac symptoms accompanying or immediately following the event to which the cardiac injury is ascribed. If the symptoms are immediately disabling the causal connection is clear. If a lapse of days occurs between the causal event and the complete disablement there must be a continuity of

symptoms dating from the event. It is conceivable that an intimal coronary hemorrhage might be caused by severe bodily strain and that it might give rise to no symptoms for several days, until marked obstruction of a coronary artery has taken place. Such a train of events is difficult to prove, and the possibility of its occurrence does not yet warrant its presentation as fact in a court of law.

It has been indicated that the occurrence of coronary thrombosis or, the syndrome of angina pectoris after unusual effort gives presumptive evidence of antecedent sclerosis of the coronary arteries. Such arteriosclerotic lesions may give rise to no symptoms and to no cardiac disturbances; they may be nothing but evidence of normal aging. From the point of view of the law, the patient is not diseased nor has he clinical disease. When an unusual strain during work is followed by cardiac disability in the sense outlined, and when this occurs in a person who has been previously well and free from symptoms while at work, it is proper to conclude that the disability was induced by the work and is therefore compensable.

SUMMARY

In fourteen cases coronary occlusion or the syndrome of angina pectoris immediately followed a nonpenetrating injury to the precordium or unusual bodily effort. Eleven additional similar cases have been observed, and further cases have been reported in the literature.

Pathologic studies of several authors suggest the mechanism by which such traumatic lesions of the coronary circulation can be induced.

When a person previously free from symptoms of coronary artery disease has such symptoms after an injury to the chest or unusual physical exertion, the heart disease may be attributed to these external factors. When a person with simple angina pectoris has coronary artery occlusion following such injury or effort the sudden progression of the lesion may be ascribed to these causes. When such a sequence of events occurs in a person gainfully employed while he is at his task, it is proper to conclude that the cardiac disability is compensable, provided the cardiac symptoms accompany or follow immediately on the event to which the cardiac injury is ascribed and provided there is a continuity of symptoms dating from the event to the time of complete disability. Such disability may be delayed by several days or weeks.

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This Disruption of Medicine.—First physiology abandoned medicine, and in going took largely from medicine its function of studying the normal processes of the body; it also took something more important, for clinical medicine seemed to relax its claim to the use of the experimental method, which it had forged and which physiology, its offspring, now chose as its own chief weapon. Pathology has budded or is budding off, assuming for its part the study of the mechanism of disease, human or otherwise, and in almost all its aspects. This disruption of medicine, as it was originally constituted and as Harvey knew it, may be the inevitable outcome of its growth, may profit physiology, may profit general pathology, may even profit the medical sciences when these are viewed as one whole; but it is a process which can be carried too far, and it then becomes, becoming, detrimental to the development of the clinical branches of work. It is necessary for medicine, still the parent and still largely possessed of guiding authority, to call a check to this subdivision of her estate.—Lewis, Sir Thomas: *Research in Medicine and Other Addresses*, London, H. K. Lewis & Co., Ltd., 1939.

BLOOD STUDIES IN BRUCELLOSIS

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In another paper¹ it was pointed out that the introduction of various intracutaneous tests and Huddleson's opsonocytaphagic reaction, while providing a new approach to the study of brucellosis, has raised certain confusing problems which have not yet been solved. It seems probable that these tests, together with the agglutination reaction, are of service in indicating whether or not the tissues have been invaded by *Brucella* at one time or another, in this respect affording information of essentially the same value and limitations as the tuberculin test in suspected tuberculosis or the Wassermann test in syphilis. Doubt has properly been cast on the infallibility of Huddleson's diagnostic criteria, however, by the facts that brucellosis, a common and endemic disease, may be latent or asymptomatic and that the finding of positive tests may thus not indicate active disease but merely coincidental infection of no significance.

The difficulties are further increased by the paucity of physical signs, so that at the present time the diagnosis of brucellosis must rest on indirect laboratory evidence plus a more or less typical symptomatology. It becomes important, therefore, to search for measurable objective abnormalities sufficiently typical and frequent to assist in determining the presence or absence of activity. In a series of patients tested for brucellosis, we have encountered certain morphologic changes in both red and white blood cells so frequently as to warrant a somewhat detailed report.

METHODS AND MATERIALS

Source of clinical material and diagnostic methods were detailed in another communication.¹ Studies of the white blood cells are reported in 271 cases and of the red blood cells in 286 cases. Tests were made in all cases by Foshay's antiserum intracutaneous test,² by macroscopic agglutination tests read after forty-eight hours and by Huddleson's opsonocytaphagic test (modification of R. M. C. described by Evans.³).

Huddleson⁴ has stated that a positive cutaneous reaction (brucellergin) with low or absent opsonins indicates active disease. It is generally recognized, however, that cutaneous reactions in any disease are such delicate indicators of bacterial invasion that they may be positive even in asymptomatic disease and hence unreliable as indexes of activity. This objection likewise obtains in Foshay's antiserum test, for this reaction appears to furnish information of the same significance as those tests in which antigens or antigenic derivatives are employed. Frequently patients are encountered who present symptoms compatible with a diagnosis of chronic brucellosis and who yet give only a positive cutaneous reaction. In order to determine whether the hematologic abnormalities are as frequent in this group of cases as in those with more definite evidence of *Brucella* invasion, we have divided our

cases into two series: Group I includes those patients with only a positive antiserum cutaneous reaction, opsonins and agglutinins being absent, while group II includes those patients who, in addition to a positive cutaneous reaction, also had demonstrable agglutinins (1:40 or higher) or opsonins (at least one cell out of twenty-five showing phagocytosis of twenty or more organisms).

Technical Procedures.—All determinations were made with Bureau of Standards glassware. Blood was collected by venipuncture and clotting was prevented by a mixture of potassium and ammonium oxalate (0.05 Gm. of ammonium oxalate and 0.04 Gm. of potassium oxalate to 5 cc. of blood). Counts of the white cells were made in both chambers of a double hemacytometer, the total counts on the two sides checking within 400 cells. Differential counts were done by the two coverslip method and stained with Wright's stain. In every instance 100 cells were classified on each of two sepa-

TABLE 1.—Differential Counts in Cases Showing Lymphocytic Leukocytosis

Case	Group	Age	Total White Blood Cells	Segmented Polymorphonuclears	Stab Polymorphonuclears	Eosinophils	Basophils	Small Lymphocytes	Large Lymphocytes	Young Lymphocytes	Plasma Cells	Monocytes	Young Monocytes
867	II	40	10,300	39.5	10.5	2.5	1.0	3.5	28.5	4.0	..	10.5	..
897	II	73	11,600	35.0	13.0	1.0	1.0	8.5	31.5	1.0	..	6.0	..
968	I	42	11,600	33.0	5.0	2.5	0.5	4.0	37.0	10.0	..	8.0	..
914	I	28	9,900	46.5	5.0	..	..	5.5	35.5	2.0	..	5.0	..
848	I	7	11,100	44.5	6.5	2.5	..	15.0	23.5	3.5	..	4.0	0.5
846	I	4	10,100	49.0	2.0	0.5	..	7.0	30.0	1.0	..	9.0	0.5
843	I	5	11,200	39.5	4.5	..	0.5	20.5	32.0	5.0	..	7.0	..
748	I	47	11,500	32.5	7.5	3.0	..	16.5	21.5	3.5	1.5	13.5	..
695	I	35	9,900	45.0	8.0	2.0	..	23.0	17.0	2.0	..	3.0	..
972	II	60	12,700	52.5	3.5	4.0	1.5	4.0	27.0	1.5	1.0	5.0	..
947	II	39	12,600	40.5	2.5	3.5	0.5	2.0	31.0	10.0	0.5	9.5	..
893*	II	3	10,000	33.5	0.5	5.5	1.0	8.5	42.0	3.0	0.5	7.5	..
814	II	45	9,600	27.5	5.0	4.5	0.5	17.0	28.5	2.0	14.5	0.5	..
769	II	27	11,700	38.5	5.5	3.0	..	26.5	18.5	6.5	..	6.5	..
739	II	34	9,500	32.0	4.5	6.0	1.0	14.0	28.0	5.0	..	9.5	..
706	II	19	10,300	27.0	6.0	4.5	1.5	15.0	36.0	5.0	..	5.0	..
645	II	2	15,000	10.0	3.0	0.5	0.5	24.0	48.0	1.0	..	11.5	0.5
865	I	33	10,300	54.0	1.5	2.0	1.0	16.0	20.0	2.0	..	3.5	..

* The structure of the white cells in this case was strongly suggestive of infectious mononucleosis; but the heterophile antibody test was negative on two occasions

rate coverslip preparations; if discrepancies were noted, the slips were discarded and the process was repeated.

In the erythrocyte studies, Wintrobe's⁵ methods were employed throughout. Red blood cell counts were made from the same pipet on the two sides of a double hemacytometer, the two counts checking within 100,000 cells. Pipets were invariably shaken well in a mechanical shaker. Hemoglobin was determined by the Sahli method with instruments standardized both by the Bureau of Standards and by the Van Slyke method. In all charts dealing with erythrocytes, percentages rather than actual numbers of cases have been used, to permit comparison of our results with the normal range as determined by Wintrobe.⁶

THE LEUKOCYTES

It is generally stated that brucellosis is characterized by leukopenia with relative lymphocytosis. Amoss,⁷ however, pointed out that the disease in many instances is actively lymphocytogenic, normal or increased total white blood cell counts often showing a high percentage

From the Brucellosis Laboratory, Clayton Foundation for Research.
1. Calder, R. M. Chronic Brucellosis, South M. J., to be published.
2. Foshay, Lee C. J. Infect. Dis. 59: 330 (Nov. Dec.) 1936.
3. Evans, Alice C. Pub. Health Rep. 53: 1507 (Aug. 26) 1938.
4. Huddleson, I. F.; Johnson, H. W., and Hamann, E. E. Am. J. Pub. Health 23: 917 (Sept.) 1933.

5. Wintrobe, M. M. Am. J. M. Sc. 177: 513 (April) 1929; Blood of Normal Young Women Residing in a Subtropical Climate, Arch. Int. Med. 45: 287 (Feb.) 1930.
6. Wintrobe, M. M.: Bull. Johns Hopkins Hosp. 53: 118 (Sept.) 1933.
7. Amoss, H. L. Internat. Clin. 4: 93 (Dec.) 1931.

of lymphocytes. In our experience acutely and seriously ill patients ordinarily have leukopenia. But in the chronically ill patients in this series leukopenia is not invariable (chart 1). The average total leukocyte count was found to be 7,225 in the group I cases, 7,130 in the group II cases and 7,173 in all cases. Counts above 9,500 not explainable on the basis of obvious complications occurred in thirty instances; of these, only twelve showed a polymorphonuclear leukocytosis while eighteen showed lymphocyte percentages of from 38 to 63 per cent (table 1).

The Lymphocytes.—Evidence of active stimulation of lymphopoietic centers was observed in almost every case. Two hundred and six (76 per cent) of the 271 patients had more than 30 per cent of lymphocytes, and

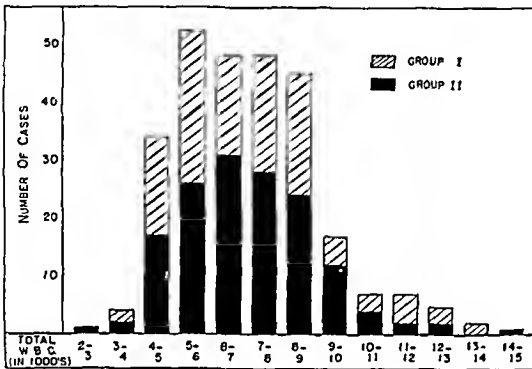


Chart 1.—Total leukocytes.

forty-five patients (16.6 per cent) had more than 50 per cent of lymphocytes (chart 2). Absolute numbers of lymphocytes were likewise increased; 151 of the 271 patients showed more than 2,500 of these cells, and in thirteen cases they numbered more than 5,000 (chart 3). Active lymphocytogenesis was further evidenced by the appearance of immature lymphocytes in the peripheral blood, as studied by the methods of Wiseman.⁸ According to Wiseman an absolute value of approximately 100 is the usual maximum of these elements for the normal person. In contrast to this norm, four fifths of our patients showed values higher than 100. Wiseman's studies indicate that the occurrence of such forms constitute a "shift to the left" in the

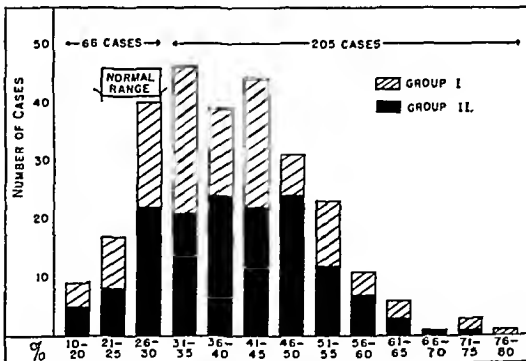


Chart 2.—Percentages of total lymphocytes.

lymphocyte series analogous in import to the well known "shift to the left" in the granulocyte series in the usual Schilling count (chart 4).

Microscopic Appearance of the Lymphocytes.—The mature lymphocytes in our cases frequently showed only

a few or even no azurophilic granules. Large lymphocytes were more frequent than small lymphocytes, but this fact, as pointed out by Wiseman, is probably due to fixation and drying. Those cells having relatively large amounts of cytoplasm were not suggestive of the cells of infectious mononucleosis, in that nuclei of

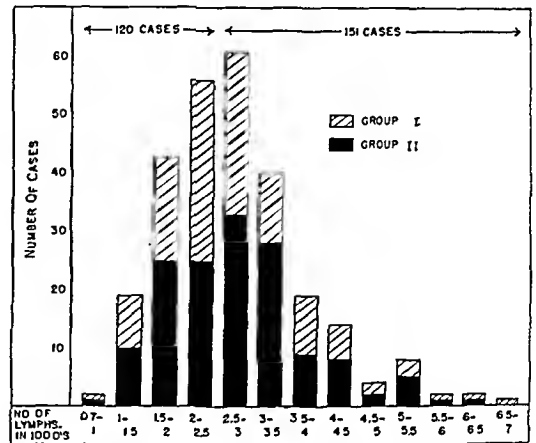


Chart 3.—Distribution of lymphocytes (absolute numbers) by cases.

ameboid shape were not encountered, nor was the cytoplasm of the foamy, light blue appearance characteristic of mononucleosis. Only one exception was noted, and in it the heterophile antibody test was negative on two occasions.

The immature lymphocytes were characterized by the frequent occurrence of nucleoli. The nucleus of these young cells was purplish blue and of fairly even distribution, and the cytoplasm, which contained no granules, was deeply basophilic, approaching true blast

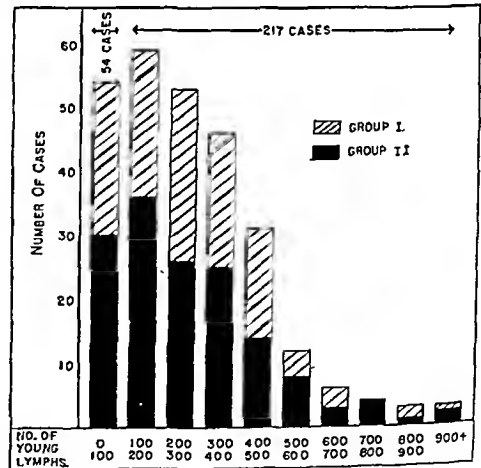


Chart 4.—Young lymphocytes (absolute numbers) by cases.

cells in its affinity for the basic stains. All gradations of basophilia were observed in different cells, but in our data only those cells with deeply basophilic cytoplasm were classified as immature.

Some of the cells, obviously immature because of their cytoplasmic basophilia, differed from those described in that their nucleus was small, round and intensely stained; their chromatin, while densely clumped, was not arranged in orderly fashion. Still other cells, which we classified as young lymphocytes, approached plasma cells in appearance, the chromatin being arranged in typical cart-wheel formation and the nucleus occasionally

even being eccentrically placed. We did not classify this type as a plasma cell, however, because the cytoplasm seemed identical in appearance to that of the immature lymphocytes, and the cells were definitely smaller than typical plasma cells.

Plasma Cells.—In slightly more than one third of our cases, cells possessing all the characteristics of plasma cells were observed. When present, they accounted for from 1 to 3 per cent of the total leukocytes. It is not our purpose to discuss whether or not plasma cells belong to the lymphocytic series; in our tables they have not been so classified. If they actually belong in the

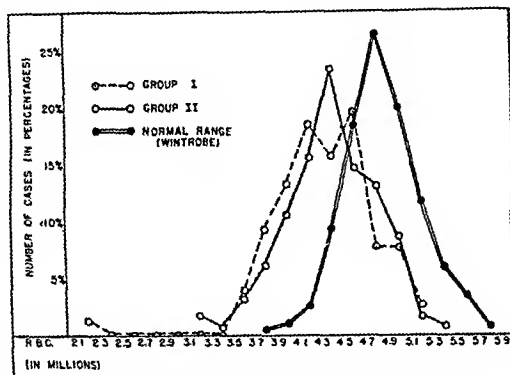


Chart 5.—Red blood cell counts (females).

lymphocytic series, their presence is additional evidence of the lymphocytogenic effect of *Brucella* infection.

The Monocytes.—In general, the absolute number of monocytes was not increased. Of the 271 cases, 227 (approximately 84 per cent) showed less than 700 monocytes, while forty-four (approximately 16 per cent) showed more than this number. Only seven patients had more than 1,000 monocytes, the maximum being 1,800; only one of these patients was a child, and in all of them tuberculosis had been excluded by appropriate tests.

Structurally there was nothing especially striking about the monocytes. We gained the impression that

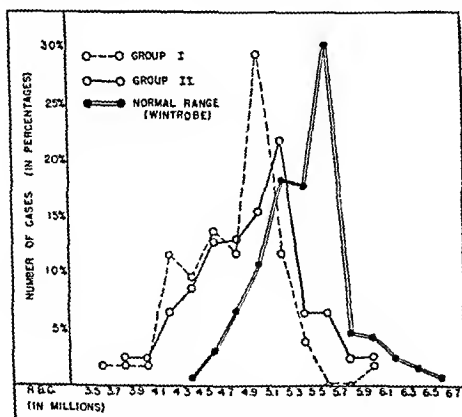


Chart 6.—Red blood cell counts (males).

more than the usual number of these cells showed diffuse, fine, pink granulation and that immature forms, as evidenced by basophilia of the cytoplasm, were more frequent than in normal bloods; but these changes were not definite enough to appear significant.

Monocyte-Lymphocyte Ratio.—Cunningham and Sabin and their associates⁹ have stressed the importance of the monocyte-lymphocyte ratio as an index of the state of activity in tuberculosis. Since in many respects the fundamental pathologic changes of tuberculosis and brucellosis are similar, a determination of

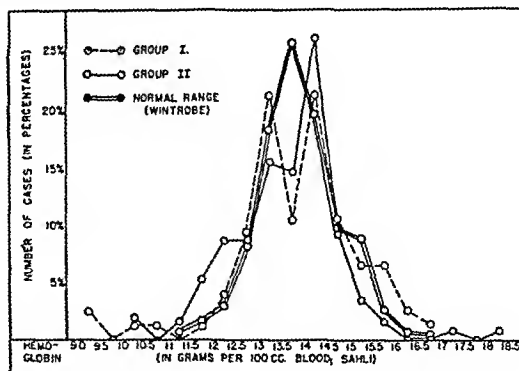


Chart 7.—Hemoglobin (females).

the monocyte-lymphocyte ratio in our cases is of interest. In almost all instances, the observed monocyte-lymphocyte ratio was lower than normal (0.33); it was normal or above in only twenty-seven cases. Extremely low values (0.15 or less) were observed in more than half of the cases. Attempts to relate the monocyte-lymphocyte ratio to state of activity, severity of infection or prognosis must await further observations.

The Granulocytes.—The total number of granulocytes was almost invariably reduced, both in percentages and in absolute numbers. The percentage of "stabs" neutrophils was often elevated, but the increase in absolute numbers of these elements was not so striking. The left shift in certain cases is reminiscent of the counts in typhoid; but in our experience the percentage of "stabs" is rarely as high as in typhoid. It would appear from these observations that, in certain instances at least, myelogenic stimuli are present but that peripheral destruction exceeds their production.

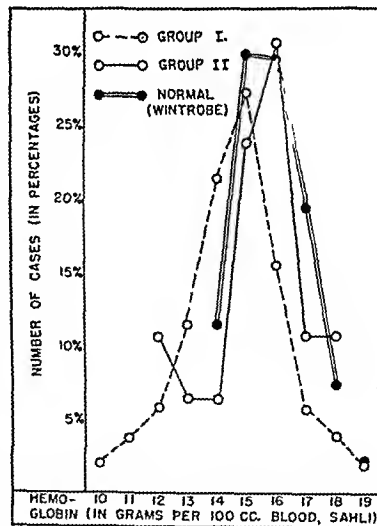


Chart 8.—Hemoglobin (males).

The question is of practical importance because of the phagocytic role of the polymorphonuclear cells in ridding the body of *Brucella*.

In one tenth of the cases, basophils were present in proportions greater than 1 per cent, the maximal percentage observed being 3. Approximately one fifth of these cases showed eosinophil counts of 5 per cent or more. Even excluding those cases for which there is an obvious explanation of the eosinophilia, the increase

9. Cunningham, R. S.; Sabin, Florence R.; Sugiyama, S., and Kindwall, J. A.: *Bull. Johns Hopkins Hosp.* 37: 231 (Oct.) 1925.

in these cells is noteworthy. "Stab" eosinophils were frequent, at times equaling the mature forms in number. The significance of these observations is not apparent.

THE ERYTHROCYTES

Total Erythrocyte Counts.—As will be seen from charts 5 and 6, severe grades of anemia were rarely encountered. On the average, the red blood cell counts were approximately a half million lower than normal. Mean values for the various groups are shown in table 2. In the few cases showing severe grades of

detail. Definite macrocytosis (charts 9 and 10) was present in more than half of the cases, and the incidence of hyperchromia was likewise striking. In only six cases of apparently uncomplicated brucellosis were microcytosis and hypochromia observed.

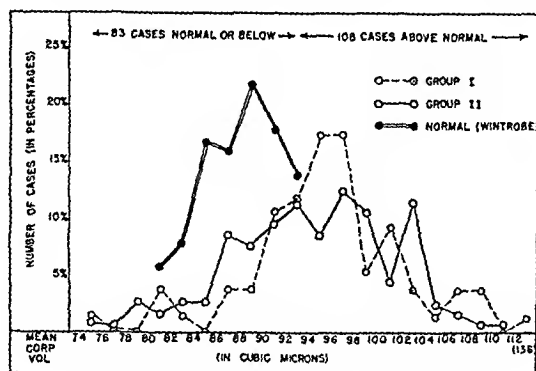


Chart 9—Mean corpuscular volume (females).

anemia, an explanation of the anemia (menorrhagia, secondary infections, coincidental malaria, inanition and the like) was usually obvious.

Hemoglobin Determinations.—The values for hemoglobin, as determined by the Sahli method and calculated in grams per hundred cubic centimeters of blood, showed curves closely paralleling normal (charts 7 and 8). The average values (table 2) also approximated normal.

Volume of Packed Red Blood Cells.—On the average, the volume of the packed red blood cells (obtained by centrifuging in hematocrit tubes and noting the proportion of packed red cells to supernatant plasma) showed a smaller departure from normal than did the total erythrocyte counts (table 2).

TABLE 2—Summary of Mean Values

	Group I Cases	Group II Cases	All Cases	Normal Mean (Winthrope)
Red blood cells, female	4.32	4.39	4.37	4.85
Red blood cells, male	4.75	4.91	4.82	5.43
Hemoglobin, female	13.72	13.59	13.64	13.90
Hemoglobin, male	14.58	15.46	14.94	15.90
Volume of packed red blood cells, females	41.15	41.10	41.15	41.80
Volume of packed red blood cells, males	43.59	45.72	44.59	47.70
Mean corpuscular volume, females	95.80	94.20	94.80	88.00
Mean corpuscular volume, males	91.90	98.50	92.70	86.50
Mean corpuscular hemoglobin content, females	31.90	31.10	31.40	29.20
Mean corpuscular hemoglobin content, males	30.80	31.60	31.20	29.10
Mean corpuscular hemoglobin concentration, females	33.30	33.00	33.20	33.50
Mean corpuscular hemoglobin concentration, males	32.50	33.90	33.00	34.00

Mean Corpuscular Volume and Hemoglobin Content.—The disproportion between volume of packed red cells and total erythrocyte counts is accounted for by the fact that the average volume of the individual red cell is significantly greater than normal. Similarly, the disparity between total hemoglobin and erythrocyte counts is reflected in hyperchromia of the red blood cells. Charts 9, 10, 11 and 12 show these changes in

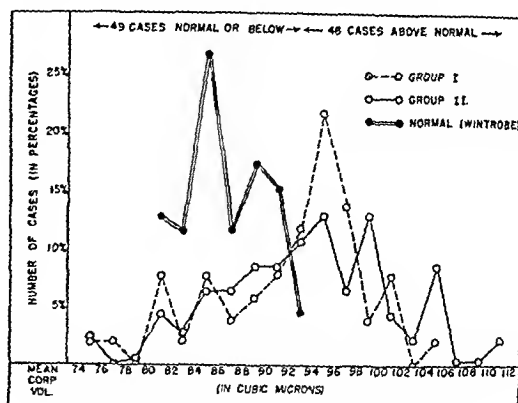


Chart 10—Mean corpuscular volume (males).

As a check on the accuracy of our determinations of average erythrocyte volume, measurements of the diameters of red blood cells by the method of Price-Jones were made in twenty-three of these cases. By this method also a distinct macrocytosis is apparent (chart 13).

Mean Corpuscular Hemoglobin Concentration.—Bethell¹⁰ has called attention to the fact that, if the plasma proteins are low, osmotic relationships between red cells and plasma are disturbed, with resultant swelling (relative macrocytosis) of the erythrocytes. Since the hemoglobin content of the cell remains constant, the swelling of the cell results in its being less saturated with hemoglobin than usual. Such a condition results in the triad of macrocytosis (cell volume greater than

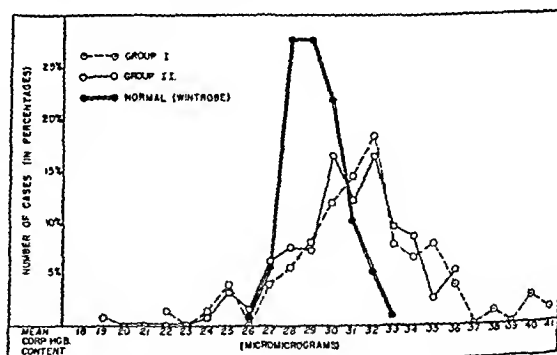


Chart 11.—Mean corpuscular hemoglobin content (females).

95 cubic microns), normal mean corpuscular hemoglobin content (from 28 to 31 micromicrograms), and decreased mean corpuscular hemoglobin concentration (less than 32 per cent).

Our cases were therefore analyzed to determine how frequently this triad occurred. Charts 14 and 15 show the hemoglobin concentrations of all patients studied. It will be noted that the hemoglobin concentration is low in a fairly large percentage of cases (sixty-eight cases). But these data include forty-five cases of definite hypochromia, most of them presenting complications sufficient to account for the low hemoglobin

¹⁰ Bethell, F. H., and Rottschaefer, Gerald: Univ. Hosp. Bull., Ann Arbor 2: 65 (Nov.) 1936.

content. Excluding these and two cases of pregnancy, there remain only twenty-one cases (7.3 per cent) in which the possibility exists that the observed macrocytosis was due, partly at least, to a circulatory phenomenon.

In contrast to this small number of patients in whom the macrocytosis was apparently merely a physical phenomenon, it is impressive to note the large number of cases in which the hemoglobin concentration of macrocytes was normal or even high. The conclusion seems justified that the observed macrocytosis is due not merely to physical alteration of osmotic relationships but to defects of maturation.

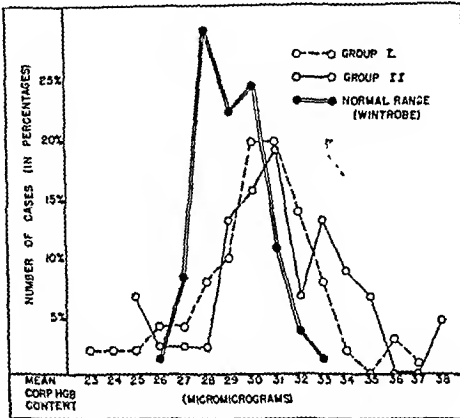


Chart 12—Mean corpuscular hemoglobin content (males).

Microscopic Appearance of Erythrocytes.—Variations in size and shape of the erythrocytes were minimal. In general, the cells were all larger than normal and their hemoglobin content was likewise uniformly increased. Hypochromia and microcytosis were distinctly rare. In a very few instances pencil-shaped cells were observed. Nucleated red blood cells were infrequent. In two or three cases the inclusion of red blood cells in monocytes was observed. Polychromatophilia of slight degree was present in approximately 10 per cent of the cases.

Reticulocytes.—Reticulocyte counts were done in twenty-two of the cases reported in this series. The values ranged from 0.3 to 3.3 per cent, with mean values of approximately 1 per cent.

TABLE 3.—Sedimentation Rates of Erythrocytes

Millimeters per Hour	Group I Cases		Group II Cases	
	Male	Female	Male	Female
15 .	8	1	15	3
6-9	10	13	4	15
10-15	10	16	11	22
16-25	12	23	9	32
26-35	15	10	4	23
36-45	12	6	1	8
46-55	2	7	3	9
56-65	1	1	0	5

Coagulation.—In approximately one third of these cases, clotting was slow and incomplete. Free cells were often present even after the blood had stood overnight in the ice box. Normal retraction of the clot was rare; often there was no retraction at all. The coagulation defects do not seem to be related to decrease in blood platelets, for these elements are grossly normal in number and appearance in the stained preparations.

Sedimentation Rate of Erythrocytes.—Moderate acceleration of sedimentation rates (above Wintrobe's normal of 9 mm. for males and 15 mm. for females) occurred in slightly more than one third of these cases.

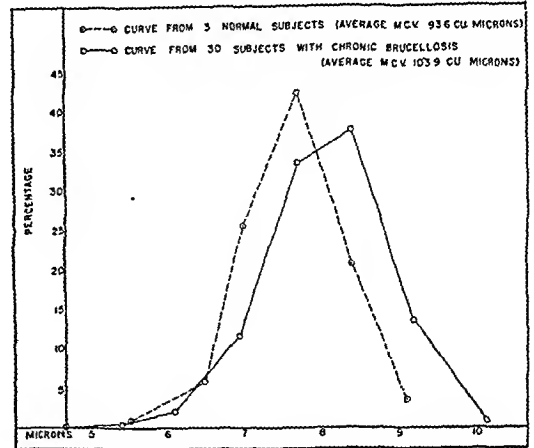


Chart 13.—Price Jones curves in chronic brucellosis.

Very slow rates were not uncommon. Excessively fast rates were usually explainable on the basis of complications, such as arthritis or effusions (table 3).

Gastric Analysis.—Gastric analysis was done in ten cases in which there were macrocytosis and hyperchromia. Our procedure was to aspirate the fasting contents and then administer 50 cc. of 7 per cent alcohol and 0.4 mg. of histamine, specimens being withdrawn at fifteen minute intervals.

In nine of the ten cases there was no free hydrochloric acid in the fasting specimens. All of them, however, showed free acid after histamine. Values

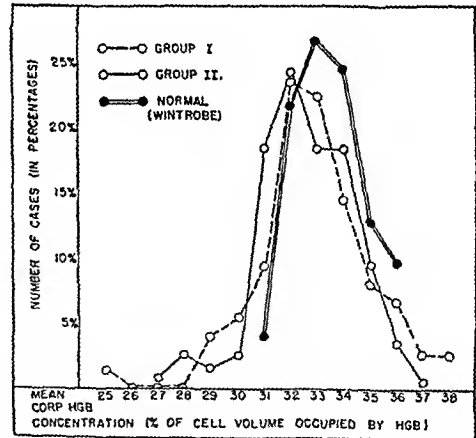


Chart 14.—Mean corpuscular hemoglobin concentration (females).

were definitely low in five cases, in the lower limits of normal in two cases and within the usual range of normal in three cases. Neither complete histamine anacidity nor, on the other hand, excessively high acidity was encountered.

Van den Bergh Tests.—The van den Bergh test was performed on 142 untreated patients. Of these, eighty-seven (61 per cent) showed bilirubin values of less than 0.5 mg. per hundred cubic centimeters of blood, while fifty-five (39 per cent) showed higher values. In the latter group, most of the values were less than 1 mg., the highest being 1.8 mg. The reaction was of the delayed direct type, the color change occurring after

thirty seconds and reaching its maximal intensity before the addition of alcohol and ammonium sulfate.

Evidence of Damage to the Liver.—It has been recognized previously that portal cirrhosis of the liver is often associated with macrocytosis. Wintrobe¹¹ has summarized the literature on the subject, and his description of the blood changes in diseases of the liver parallels our observations on the blood in these cases: "The anemia . . . is rarely severe. The macrocytosis affects the great majority of the red corpuscles, which show relatively little variation in shape or size.

The lack of variation in the size of the corpuscles, however, does not distinguish the condition from pernicious anemia, for the distribution curves of the diameters of the red corpuscles are like those in cases of pernicious anemia with similar grades of anemia. Nucleated red corpuscles are uncommon and the fragility of the erythrocytes is normal." It is very

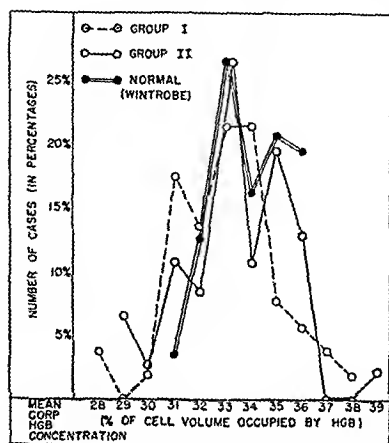


Chart 15—Mean corpuscular hemoglobin concentration (males)

unlikely that the cases which are included in our series represent the accidental association of pernicious anemia with brucellosis, for in the first place they are too numerous, and in the second place histamine anacidity has not occurred in those cases in which the gastric contents have been examined.

The striking parallelism between our observations and those cited by Wintrobe as occurring in hepatic disease makes reasonable the conclusion that these changes in all probability are due to anatomic or functional derangement of the liver. Contributory evidence for this idea is held in the facts that (1) low grade jaundice as measured by the van den Bergh reaction is not uncommon, (2) this reaction is of the delayed direct type, which ordinarily is associated with structural damage to liver parenchyma, and (3) the liver is, in our experience and that of others, more commonly enlarged in this condition than is the spleen.

SUMMARY

Structural studies of the blood were made in almost 300 patients with evidence of *Brucella* invasion. Normal leukocyte counts occurred in one half, leukopenia in one third and leukocytosis in one sixth of the cases. Active lymphocytosis was the most striking feature encountered and was evidenced by an increase in both percentage values and absolute numbers of lymphocytes and by unusually high numbers of immature lymphocytes (a lymphocytic "shift to the left"). Plasma cells were frequent. Monocytes in general were not increased in number, and the monocyte-lymphocyte ratio was almost invariably low. Many cases showed a moderate increase in percentage of "stab" neutrophils, but the total number of neutrophils was usually reduced. In one fifth of the cases there was moderate eosinophilia, often with immature forms.

Mild anemia of the macrocytic, hyperchromic type was frequent. Evidence was obtained that these changes are due to maturation defects, probably the result of damage to the liver.

Coagulation of the blood was slow and often incomplete. Clot retraction was also imperfect. The sedimentation rate was usually not extremely high except when complications, such as arthritis, were present.

These abnormalities of the blood were observed so consistently that they appear to represent a fundamental part of the disease with which these patients are suffering. So far as we are aware, they are duplicated in their entirety by no other known disease. It would seem, therefore, that the regularity with which they occurred in this group of patients is confirmatory evidence of the specificity of the tests on which the diagnosis of brucellosis was made.

Further analysis of our data indicates that these blood changes occur as often in patients with only a positive cutaneous reaction as in those who also show agglutinins and opsonins. Since these abnormalities seem to be a specific effect of *Brucella* invasion, their equal incidence in the two groups of patients indicates that, in many instances, a positive antiserum cutaneous reaction may be the sole evidence of brucellosis.

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PLASMA PROTHROMBIN AND THE BLEEDING TENDENCY

WITH SPECIAL REFERENCE TO JAUNDICED PATIENTS AND VITAMIN K THERAPY

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It is our main purpose in the present article to discuss treatment of the bleeding tendency so often seen in patients suffering from disease of the biliary tract. Bleeding from mucous surfaces often occurs spontaneously in these patients, but the greatest danger is from bleeding at operation or from the wound after operation.

Through the work of several laboratories¹ it has been shown that a newly discovered vitamin, vitamin K,

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1. Reported by Dam, Henrik, "The Antihemorrhagic Vitamin of the Chick, Biochem J 29: 1273 (June) 1935.

Dam, Henrik; Schönheyder, Fritz, and Tage Hansen, Erik, "Studies on the Mode of Action of Vitamin K," *ibid* 30: 1075 (June) 1936.

Schönheyder, Fritz, "The Quantitative Determination of Vitamin K," *ibid* 30: 890 (May) 1936.

Almqvist, H. J., and Stokstad, E. L. R., "Hemorrhagic Chick Disease of Dietary Origin," *J. Biol. Chem* 111: 105 (Sept.) 1935.

Quick, A. J., "The Coagulation Defect in Sweet Clover Disease and in the Hemorrhagic Chick Disease of Dietary Origin," *Am J Physiol* 118: 260 (Feb.) 1937.

Hawkins, W. B., and Brinkhous, K. M., "Prothrombin Deficiency the Cause of Bleeding in Bile Fistula Dogs," *J. Exper. Med* 63: 793 (June) 1936.

Greaves, J. D., and Schmidt, C. L. A., "Nature of the Factor Concerned in Loss of Blood Coagulability of Bile Fistula Rats," *Proc Soc. Exper. Biol & Med* 37: 43 (Oct.) 1937.

Warner, Brinkhous and Smith.²
Butt, Snell and Osterberg.³
Dam and Glavind.⁴
Smith, Warner, Brinkhous and Seegers.¹⁰

¹¹ Wintrobe, M. M., "Relation of Disease of the Liver to Anemia," *Arch. Int. Med* 57: 289 (Feb.) 1936.

plays an important part in prothrombin formation in the body. Patients with obstructive jaundice or with biliary fistulas, having no bile in the intestine, have difficulty in absorbing such fat-soluble materials. Without adequate absorption of vitamin K they suffer from faulty formation of prothrombin, and for this reason a tendency to bleed develops.

The therapeutic use of vitamin K in the treatment of jaundiced bleeders was first reported by Warner, Brinkhous and Smith² and almost simultaneously by Butt, Snell and Osterberg.³ Additional cases were reported almost at once by Dam and Glavind.⁴ All these reports have indicated that dramatic relief from the bleeding tendency is obtained in most cases by the administration of vitamin K. Further details of the literature on this vitamin may be obtained from the articles just cited.

BLEEDING IN OBSTRUCTIVE JAUNDICE: REPORT OF CASE

E. W., a white woman aged 53, who entered Mercy Hospital April 20, 1938, because of pruritus and jaundice, for the past two years had had periodic attacks of pain in the right upper quadrant of the abdomen. The attacks lasted from one hour to several days. Early in February they increased in severity and were accompanied by lassitude and weakness. Jaundice made its appearance at this time, but the patient refused hospital treatment until the pruritus had become intolerable.

She was well developed and well nourished. The skin showed marked jaundice and much excoriation because of the pruritus. There were considerable rigidity and tenderness in the right upper quadrant, but the gallbladder could not be felt. The temperature, pulse rate and respiratory rate were within normal limits. The stools were clay colored and the urine deep yellow. The coagulation time was six minutes by the capillary tube method.

At operation, April 22, a number of stones were removed from the gallbladder and one large stone was removed from the common bile duct. A drainage tube was placed in the gallbladder and another in the common bile duct.

After operation the patient showed no untoward symptoms for several days. The temperature remained at about 37 C. (98.6 F.). April 26 bile ceased to drain and some blood dripped from the tube. Irrigation of the tube was attempted but was discontinued because of pain. On the following day the dressings were found to be saturated with blood. The patient vomited 300 cc. of fluid which contained bright red blood. The stools were tarry black. Bleeding continued on the following day and the jaundice, which had been subsiding, began to increase, probably because of obstruction by blood clots. April 29 an attempt was made to give an enema, but before much fluid had been injected the patient expelled 1,000 cc. of reddish black fluid, obviously blood.

A sample of blood drawn at this time showed deep jaundice of the plasma (van den Bergh test, 17 mg. per hundred cubic centimeters). The coagulation time was thirteen minutes by the capillary tube method. The bleeding time (Duke's method) was greatly prolonged, the patient continuing to bleed for more than six hours from a simple stab wound. The red cell count, previously normal, had now fallen to 2,000,000. A transfusion of 300 cc. of blood was given April 29 and another April 30. These transfusions seemed to have little effect, for oozing from the operative wound continued.

At this stage, analyses for prothrombin carried out for the first time showed the plasma prothrombin content to be 8 per cent of normal, a result considered adequate to explain the

bleeding. April 30 and May 1 vitamin K emulsified in 30 cc. of 2 per cent sodium taurocholate was given by mouth. Each dose contained the vitamin which had been extracted^{4a} from 200 Gm. of dry alfalfa meal. Bleeding from the operative wound ceased within twenty-four hours of the onset of treatment. The treatment itself produced some nausea; hence the vitamin was given in capsule form on the following two days. May 3, after three days of treatment, the plasma prothrombin content had risen to 69 per cent of normal from the original 8 per cent. The bleeding time (Ivy's⁵ method) was now six minutes. May 3 and 4 the vitamin, given in emulsion form in half the original dose, produced no nausea. During the following three days no vitamin K was given and May 7 the dressings again showed blood. Blood drawn for analyses showed that the plasma prothrombin content had fallen to 47 per cent, a level which we have come to consider in the upper part of the danger zone. From May 9 to 18 the patient received vitamin K emulsion equivalent to 100 Gm. of alfalfa meal daily. The bloody drainage ceased on May 10, and the plasma prothrombin content on May 17 was found to be 71 per cent of normal.

The jaundice increased for a few days after removal of the drain on May 1 but thereafter it subsided and on May 12 the van den Bergh test showed that the plasma bilirubin content had fallen to 4.1 mg. per hundred cubic centimeters. May 18 the jaundice had completely subsided and vitamin K therapy was discontinued. The remainder of the patient's stay in the hospital was entirely uneventful, except for a transient period of vomiting. The patient left the hospital June 5 and when seen August 23 had remained free from symptoms.

This case illustrates postoperative bleeding in a patient with chronic biliary obstruction. There was no serious bleeding at the time of operation, but four days after operation blood began to ooze at the operative site and this bleeding continued despite two transfusions. The plasma prothrombin concentration at that time was 8 per cent of normal. We have noted in a number of cases that when the plasma prothrombin level is low prior to operation one may anticipate a further fall after operation. This fall is presumably due to the utilization of prothrombin in forming fibrinous exudate at the operative site. The level at which bleeding actually occurs is variable, and the actual onset of bleeding is often precipitated by the operation itself or even by minor traumatic factors. Rarely does bleeding occur until the prothrombin has been reduced at least to 50 per cent of normal. Occasionally a level of 20 per cent will be tolerated without hemorrhage, but patients below the 50 per cent level are definitely in the danger zone.^{5a}

Relief from bleeding in this case occurred within twenty-four hours after the institution of vitamin K therapy. This is in accord with previous experience⁶ that the plasma prothrombin level rises rapidly out of the danger zone when vitamin K is absorbed in adequate amounts. At the end of three days of treatment the prothrombin level had risen to 69 per cent of normal, whereas it had been 8 per cent of normal. This case also illustrates the point that treatment should not be relaxed too early, for when it was discontinued the prothrombin level fell to 47 per cent within three days and bleeding began again. On resumption of therapy, bleeding again ceased and the prothrombin level rose to 71 per cent. One cannot urge too strongly that

2. Warner, E. D.; Brinkhous, K. M., and Smith, H. P.: Bleeding Tendency of Obstructive Jaundice: Prothrombin Deficiency and Dietary Factors, *Proc. Soc. Exper. Biol. & Med.* 37: 628 (Jan.) 1938. Brinkhous, Smith and Warner.²

3. Butt, H. R.; Snell, A. M., and Osterberg, A. E.: The Use of Vitamin K and Bile in Treatment of the Hemorrhagic Diathesis in Cases of Jaundice, *Proc. Staff Meet., Mayo Clin.* 13: 74 (Feb.) 1938.

4. Dam, Henrik, and Glavind, Johannes: Vitamin K in Human Pathology, *Ugesk. f. læger.* 100: 248 (March 10) 1938; *Lancet* 1: 720 (March 26) 1938.

4a. Brinkhous, K. M.; Smith, H. P., and Warner, E. D.: Prothrombin Deficiency and the Bleeding Tendency in Obstructive Jaundice and in Biliary Fistula: Effect of Feeding Bile and Alfalfa (Vitamin K), *Am. J. M. Sc.* 196: 50 (July) 1938.

5. Ivy, A. C.; Shapiro, P. F., and Melnick, P.: The Bleeding Tendency in Jaundice, *Surg., Gynec. & Obst.* 60: 781 (April) 1935.

5a. Warner, Brinkhous and Smith.² Brinkhous, Smith and Warner.^{4a}

6. Warner, Brinkhous and Smith.² Butt, Snell and Osterberg.³ Dam and Glavind.⁴

therapy be continued at least as long as bile continues to drain at the operative site. This use of the vitamin should be extended to include the preoperative period. Had this particular patient been given vitamin for several days prior to operation, there is little doubt that excessive bleeding would have been prevented altogether.

PROTHROMBIN VALUES IN OTHER CONDITIONS

The accompanying table shows prothrombin values in a number of clinical conditions. In three cases of thrombopenia the plasma prothrombin values were within normal limits. These cases throw doubt on the view, occasionally cited,⁷ that platelets are the source of prothrombin.

In three cases of hemophilia the prothrombin values were normal. In case 4 two weeks treatment with vitamin K produced no change in the prothrombin or the clotting time (forty-five to seventy-five minutes). This is in accord with the experience of Dam and Glavind.⁴

Miscellaneous Plasma Prothrombin Values

Case No	Sex	Age (Yr.)	Diagnosis	Prothrombin, %
1	♀	13	Thrombopenic purpura	90
2	♂	0.5	Thrombopenic purpura	79
3	♂	31	Persistent thrombopenia, nonsymptomatic	100
4	♂	25	Hemophilia	96
5	♂	11	Hemophilia	86
6	♂	44	Hemophilia	92
7	♂	6	Acute leukemia	66
8	♂	46	Acute leukemia	82
9	♂	7	Acute leukemia	86
10	♂	53	Laennec's cirrhosis; primary carcinoma of liver (autopsy)	79
11	♂	53	Laennec's cirrhosis (clinical)	42
12	♂	24	Laennec's cirrhosis (autopsy)	72
13	♂	29	Laennec's cirrhosis (clinical)	66
14	♂	25	Laennec's cirrhosis (autopsy)	30
15	♂	23	Laennec's cirrhosis, slight; "Banti's disease" (laparotomy)	66
16	♀	30	Syphilitic "Banti's disease" (clinical)	63

In three cases of acute leukemia there was moderate reduction in the prothrombin level.

In six cases in which the diagnosis of Laennec's cirrhosis of the liver had been made there was a reduction in the prothrombin level. In two of these the value was definitely in the danger zone, but in neither did we observe areas of bruising or evidence of bleeding from mucous surfaces, such as one sometimes sees in patients with this disease. Patient 11 was treated for two weeks with vitamin K, but the prothrombin level remained constant at about 40 per cent. Patient 16, with a clinical diagnosis of syphilitic Banti's disease, was treated in a similar manner but without effect on the prothrombin concentration. Such results indicate that the lowering of the prothrombin concentration is not the result of a deficiency in vitamin K.

COMMENT

There is as yet no proof that vitamin K is a component of the prothrombin molecule. It may be, instead, in some way essential to proper function of the tissues concerned in the manufacture of prothrombin.

Work from this laboratory indicates that the liver is vitally concerned in the process of manufacturing prothrombin, for the plasma prothrombin level falls

when the liver is partially excised⁸ or when it is injured by chloroform poisoning.⁹ It seems probable that the lowering of the prothrombin level in cases of cirrhosis is due mainly to defective hepatic function, which is not the result of deficiency in the supply of vitamin K. This view is in accord with the fact, already reported,¹⁰ that patients with disease of the biliary tract may respond poorly to vitamin K if the liver is badly damaged (i. e. by obstructive biliary cirrhosis or by extensive growth of a neoplasm within the liver). It is now clear that prothrombin formation can be interrupted either by a reduction of the supply of vitamin K or by interference with the integrity of the liver. The vitamin is of therapeutic value in the former case.

The technic for titration of prothrombin is still somewhat too involved for general use and we have had little success in predicting bleeding by the use of tests of the bleeding time and clotting time. Many patients have normal values by these tests, and yet persistent bleeding develops. Unless prothrombin analyses are made, it is advisable to give the vitamin in a routine manner for several days to all patients with biliary disease both before operation and during the crucial postoperative period.¹⁰ The vitamin appears to be entirely harmless, for we have given it to animals in doses many times as great as the amount recommended for therapeutic use.

It has been suggested that vitamin D may be useful in the treatment of the bleeding tendency of patients with disease of the biliary tract. Being fat soluble, this vitamin too is absorbed with difficulty when bile is absent from the intestine.¹² McNealy, Shapiro and Melnick¹³ analyzed a large series of cases of disease of the biliary tract both with and without supplements of this vitamin. Their conclusions, based partly on clinical evidence and partly on tests of bleeding time, indicated a beneficial effect. A little later Boys¹⁴ reached the same conclusion. Wigodsky and Ivy¹⁵ have recently analyzed a vitamin K preparation and found it to contain so little vitamin D that its activity in such patients cannot be ascribed to the latter. It is possible that in human beings, when the disease is complicated by infection, a deficiency in vitamin D may contribute to the difficulty in forming prothrombin. However, our own experiments on dogs with sterile biliary fistulas¹⁶ failed to show that vitamin D has any effect in raising the prothrombin level. In the aforementioned cases bile or bile salt was fed along with

8 Warner, E. D.: Plasma Prothrombin: Effect of Partial Hepatectomy, *J. Exper. Med.* 68: 831 (Dec.) 1938

9 Smith, H. P., Warner, E. D., and Brinkhous, K. M.: Prothrombin Deficiency and the Bleeding Tendency in Liver Injury (Chloroform Intoxication), *J. Exper. Med.* 66: 801 (Dec.) 1937

10 Since this article was written a simple bedside test for control of vitamin K therapy has been devised by S. E. Ziffren, C. A. Owen and G. R. Hoffman of this laboratory and will be published in the near future. In brief, freshly drawn blood is mixed with one tenth its volume of thromboplastin⁹ and the clotting time compared with that of a normal control. From the ratio of the two clotting times one can calculate the clotting power in percentage of normal. This test is considerably simpler than either our prothrombin method or the test advocated by Quick (*Am. J. Physiol.* 114: 282 [Jan.] 1936)

11 Footnote deleted on proof

12 Tammann, H.: Ueber die Beeinflussung der porotischen Osteomalazie nach Gallenstiel durch das D-Vitamin, *Beitr. z. klin. Chir.* 142: 83, 1928. Graves, J. D., and Schmidt, C. L. A.: The Role Played by Bile in the Absorption of Vitamin D in the Rat, *J. Biol. Chem.* 102: 101 (Sept.) 1933

13 McNealy, R. W.; Shapiro, P. F., and Melnick, P.: The Effect of Viosterol in Jaundice, *Surg., Gynec. & Obst.* 60: 785 (April) 1935

14 Boys, Floyd: A Report on the Value of the Ivy Bleeding Time Test and the Use of Viosterol in Cases of Obstructive Jaundice, *Surgery* 2: 817 (Dec.) 1937

15 Wigodsky, H. S., and Ivy, A. C.: Assay of a Vitamin K Preparation for Vitamin D, *Proc. Soc. Exper. Biol. & Med.* 38: 785 (June) 1938

16 Smith, H. P.; Warner, E. D.; Brinkhous, K. M., and Seeger, W. H.: Bleeding Tendency and Prothrombin Deficiency in Biliary Fistula Dogs: Effect of Feeding Bile and Vitamin K, *J. Exper. Med.* 67: 911 (June) 1938

7. Bayne-Jones, Stanhope: The Presence of Prothrombin and Thromboplastin in the Blood Platelets, *Am. J. Physiol.* 30: 74, 1912

vitamin D. Since the diet normally contains small quantities of vitamin K, it is possible that the bile salt given permitted enough absorption of this vitamin to raise the prothrombin level out of the bleeding zone. It is to be hoped that studies of human beings will be repeated with the plasma prothrombin level as a control on the procedure.

CONCLUSIONS

Our case illustrates postoperative bleeding in a patient with obstructive jaundice. Such bleeding is due to profound reduction in the plasma prothrombin level. When the patient was treated with vitamin K, the prothrombin level rose and bleeding ceased.

Patients with thrombopenic purpura and patients with hemophilia have normal prothrombin values, and evidence indicates that such patients obtain no relief from administration of vitamin K.

In three cases of acute leukemia the prothrombin level was found to be slightly reduced.

In cases of Laënnec's cirrhosis the prothrombin level may be markedly reduced, but evidence indicates that the reduction is due to defective hepatic function, which is not the result of deficiency in vitamin K.¹⁷

ACUTE INTERSTITIAL PNEUMONITIS: A NEW DISEASE ENTITY

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The Cornell University Infirmary receives practically all seriously ill patients from the student body. Minor ailments, such as common colds without fever, are taken care of at the medical adviser's office or in the offices of practicing physicians of the town.

The infirmary records of the twenty years from 1917 to 1937 reveal that (1) the many cases of "cold and fever" occurred irregularly through every year but always reached their peak sometime in December, January, February or March, (2) pandemic influenza occurred in 1918-1919 and 1919-1920 only, (3) inter-pandemic influenza occurred in definite outbreaks in 1925-1926, 1927-1928, 1931-1932 and 1936-1937

TABLE 1.—*Diseases of the Respiratory Tract from 1925 to 1937*

Year	Student Regis- tration	Cases of Uncom- plicated Interpandemic Influenza	Cases of Interpandemic Influenza Complicated by Pneumonia	Cases of Pneumonia Unrelated to Influenza
1925-1926	5,132	644	4	4
1927-1928	5,205	437	3	11
1931-1932	5,916	639	3	13
1936-1937	6,177	824	4	8

(table 1) and (4) from eight to sixteen cases of pneumonia occurred through each nine month college year (table 1).

In October 1937 there began to appear a type of infection of the respiratory tract different from anything that we had seen previously. It did not belong to any of the four categories listed. It did not attack large

numbers, as inter-pandemic influenza had usually done, and it was not accompanied in the majority of cases by the bone ache and backache of typical influenza; it was apparently a new acute disease of the respiratory tract having as its cardinal feature specific lesions in the

TABLE 2.—*Diseases of the Respiratory Tract from 1937 to 1939*

Year	Student Regis- tration	Cases of Uncom- plicated Inter- pandemic Influenza	Cases of Inter- pandemic Influenza Complicated by Pneumonia	Cases of Pneu- monitis	Cases of Pneumonia Unrelated to Influenza
1937-1938	6,115	129	1	59	8
1938 to Jan. 24, 1939	6,569	41	0	27	4

lungs inaudible to the stethoscope but definite in the roentgenogram of the chest. To this disease we have applied the term acute interstitial pneumonitis.

Since October 1937, in no month when the infirmary was open have we failed to have cases of pneumonitis. There have been eighty-six cases as shown by definite radiographic evidence (table 2).

RADIOGRAPHIC EVIDENCE

Several of the patients had roentgenograms taken before definite evidence was visible on the film and were then observed almost daily as the pathologic change was developing in the lungs. Others were rechecked at regular intervals during the entire period of their illness. A review of the roentgenograms leads to the conclusion that (a) definite x-ray evidence may not appear until from thirty-six to forty-eight hours after the clinical onset, (b) the infection spreads from the hilus outward, following the bronchial and vascular tree, as do many other pulmonary infections, and (c) the cases can be roughly divided according to the radiographic evidence into three groups.

The onset has been marked by increased density in the hilar shadows, with a fan-shaped localized accentuation of and a numerical increase in the linear pulmonic markings extending from the hilus into the adjacent lung field. This extension is down into the base in the majority of the cases; it may be lateral or, not infrequently, into the first and second interspaces. In one group of cases, those of milder involvement, there then appeared over this area a diffuse even increase in density, which was not sufficient, however, to eliminate the linear markings and suggested an intense congestion rather than a true consolidation of lung tissue. The visible changes did not usually extend to the margin of the lung, and they cleared rather rapidly, ordinarily in from one to two weeks (fig. 1).

In a second group of cases, of more serious involvement, the infiltration in the fan extended more frequently to the periphery of the lung, with irregular areas of markedly increased density suggestive of lobular involvement and more typical of definite bronchopneumonia. Resolution was correspondingly slower than in the first group (figs. 2 and 3).

In about 5 per cent of the cases the involvement was severe. The development was similar to that in the preceding groups except that, in addition to the original focus, there was a diffuse spread throughout the remainder of the lung with partial or complete involvement of the other lung. This additional involvement was characterized by a generalized swelling of the pulmonic markings with a light mottling somewhat

17. Since this article was written, vitamin K has been placed on the market by Abbott Laboratories, North Chicago, Ill. The vitamin K preparations used in our own work were prepared partly by ourselves¹⁸ and partly on an experimental basis by the Upjohn Company of Kalamazoo, Mich.

From Cornell University Infirmary

similar to that of pulmonary edema or intense passive congestion and additional irregular blotchy areas of very lightly increased density. We believe the underlying pathologic change in this type of case to be a definite interstitial inflammation. In this group there was a decided tendency to some involvement of the

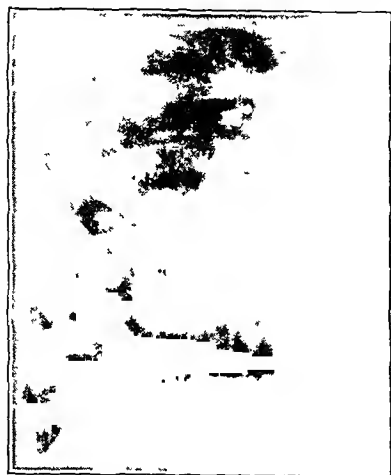


Fig. 1 (case 1).—A typical rounded fan present in the cases of mild involvement and frequently in the early stages when the disease is severe, showing the intensified lineal markings through a hazy background.

interlobar pleura and, in one case, of the parietal pleura. Clearing of the lung fields was slow, taking from one to two and one-half months (figs. 4, 5 and 6).

COURSE

The onset of the disease is usually not sudden but is ushered in by a period of weakness, malaise and slight fever lasting for two or three days. The temperature gradually mounts, and the patient begins to complain of cough,

pains in the chest or sore throat or a combination of these symptoms. (In some cases, however, the onset has been sudden, as in pneumonia.) At this stage there are usually signs of pharyngitis or a cough and a temperature of from 100 to 102 F., but stethoscopic examination of the chest gives no evidence of consolidation and there is little or no sputum. There may be a few fine rales. The radiographic evidence at this stage is usually that of group 1, and in many cases the disease recedes from this point (fig. 1).

As the disease progresses, as it does in cases of group 2, the temperature rises to 103 or 104 F., not infrequently exhibiting



Fig. 2 (case 2).—A typical rounded basal fan on the second day of illness and the forerunner of a more severe infection (see fig. 3).

the peculiarity of being up in the morning and down in the evening. The patient feels quite ill at this stage, not infrequently complains of tightness in the chest and pain on coughing and sometimes shows the flushed cheeks so often seen with pneumonia. Stethoscopic examination of the chest still reveals no pleurisy or consolidation; there may be a few fine rales, and sputum is entirely lacking or scanty and has been in none of our cases either of the "rusty" or of the "cherry juice" type. Roentgenograms of the chest at this period show the fan-shaped area of increased density, generally extending to the periphery of the lung (fig. 3).

In our third group of cases, the onset and development of the disease was similar to that in group 2 except

that there was a characteristic sudden jump in the temperature and evidences of toxicity, indicating a sudden and pronounced spread of the infection. The febrile period was more prolonged and more severe. Moist rales were invariably present, but the sputum was still scanty in proportion to what one might expect from the rales. The toxicity of the disease was severe, and the prognosis in each case for a number of days was grave. We believe that these cases are similar to those described by Dr. Hobart Reimann.¹

The leukocyte counts have shown mild leukocytosis, the commonest count early in the disease being about 8,500 and running later up to 14,000 or 16,000. In one instance late in the disease there was a leukocyte count of 22,000. The percentages of polymorphonuclears has been in most instances between 63 and 75. In only one instance did it reach 88.

The pneumonitis terminates by lysis; there is no spectacular crisis. The patient was usually hospitalized ten days, though one of the four, with severe extension of the process to both lungs, required seventy-six days. Sixty-one of the eighty-six were hospitalized for a period not exceeding fourteen days. Complications are apparently rare, there having been no bronchiectasis, no organization of exudate and no abscess in our first



Fig. 3 (case 2).—Appearance on the eighth day of illness. The area of density has extended to the periphery of the lung and is considerably widened. This represents the maximum spread of the process in this case.

eighty-six cases of the disease. There have, however, been evidences of mild pleuritic involvement in those of severe involvement. In the cases of rather rapid recovery in which the pulmonary lesions have previously been lacking, it is not unusual to find, after the patient has had a normal temperature for three or four days and been discharged

from the infirmary, many coarse rales over the areas shown by roentgenogram to be involved. These rales may be present for as long as two weeks after the termination of treatment in bed. Though the course of the disease is comparatively short in the cases of mild involvement, it has not infrequently caused the loss of from 16 to 18 pounds (7 to 8 Kg.) in otherwise healthy young college students, and several patients have found themselves so weak at the termination of the disease that they have had to ask leave of absence for the remainder of the term to recuperate. That some students can take this disease in their stride is evidenced, however, by the fact that one of our football players had a typical attack in October 1938, recovered completely and went on to participate successfully in a hard schedule of intercollegiate football.

EPIDEMIOLOGY AND ETIOLOGY

Among the eighty-six patients so far observed, there have been six instances of two from the same house, one instance of five from the same house and one

1. Reimann, Hobart A: An Acute Infection of the Respiratory Tract with Atypical Pneumonia, J. A. M. A. 111: 2377-2384 (Dec 24) 1938

instance of four from the same house. In the clusters of four and five cases, the original patient was ill and coughing about the fraternity house for several days before he went to the infirmary; the other patients followed at intervals of from five to fourteen days in one instance and from thirteen to fourteen days in the other. The other patients admitted having gone into the room of the original patient and having talked with him, thinking he "just had a cough."

In the absence of cough, the infectiousness of the disease may not be very great, since we had in the series one instance in which, under the crowded conditions of a house party

week-end, two students slept in the same bed with another student ill with pneumonitis (but not coughing) and remained well. A student who sat next to one with pneumonitis (who was coughing) in his economics class came down with the same disease twelve days later.

As a result of our limited experience, we feel that this disease is more infectious than pneumonia, and we now, as a routine, hospitalize and isolate all our patients, permitting no visitors.

In the absence of sputum, cough swabs have been obtained by tickling the pharynx. Cultures of material from these swabs and of sputum have frequently been reported as showing mixed *Streptococcus viridans* and *Staphylococcus aureus*. In mouse tests of the sputum

at the Tompkins County laboratory, the mice have but rarely succumbed, but when they have, pneumococci have usually been found. Material sent to the New York State Health Department laboratory has led to occasional reports of the higher types of pneumococci, e. g. type VIII, types XV and XVIII and type XI. On the basis of evidence accumulated to date, no

as to cause, but a virus would seem more probable than bacteria.

COMMENT

The question may well be asked Why is this disease not simply atypical pneumococcic pneumonia? We feel that it is not for the following reasons:

1. The areas of density shown in the roentgenograms are not lobar and are less dense than in the case of lobar

pneumonia. The radiographic evidence in the majority of cases does not conform with that usually found in cases of bronchopneumonia. 2. The fever is intermittent rather than continuous, as in pneumonia. 3. There is milder leukocytosis and a smaller rise in the polymorphonuclear count than is the rule in pneumonia. 4. Severe sweating is much more common than in pneumonia. 5. The disease appears to be more communicable than pneumonia usually is. 6. The respiratory rate is not as high as that usually found with pneumonia. 7. There has been much less sputum and no "rusty" sputum or "cherry juice" sputum in our cases. 8. There is much less prostration than is the rule in pneumonia. 9. The number of cases and the time of year they have occurred are both entirely out of line with any of our previous records of pneumonia. 10. Careful bacteriologic examination has failed to show pneumococci consistently in the sputum, while rapid isolation and typing of pneumococci in cases definitely of pneumonia is our common experience.

Is acute interstitial pneumonitis a new disease? A checking of the available literature does not give us a definite answer to this question. In only four published works do we find reference to outbreaks of disease probably identical with or closely allied to this disease:

1. According to the records of the medical department of the United States army in the World War:

Certain cases of average severity, however, showed on physical examination persistent rales at either base. At Fort Sam Houston, Texas, 25 per cent of 1,000 cases of uncomplicated influenza gave this finding. There was no other evidence clinically of anything resembling pneumonia; however, x-ray plates showed local areas of increased density corresponding to the physical signs in practically all of this group. This finding is probably to be interpreted as an early or slight example of the lesion described from Walter Reed General Hospital as "hemorrhagic pneumonitis."

2. Major Albert Bowen³ recorded an epidemic of "acute influenza pneumonitis" occurring in United States troops stationed in Hawaii from 1931 to 1934 and described the radiographic evidence as follows:

Influenza pneumonitis involves only a portion of a lobe, usually basal, though it has been seen in the upper lobes and involving more than one lobe without increase in symptoms. It extends outward from the hilus well into the parenchyma, occasionally reaching the periphery. The roentgen appearance is

2. United States History of the World War, Washington, D. C. Government Printing Office, 1928, vol. IX, Section on Roentgenology, p. 153.

3. Bowen, Albert: Acute Influenza Pneumonitis, *Am. J. Roentgenol* 34: 168-174 (Aug.) 1935.



Fig. 4 (case 3).—Initial rounded fan on the third day of illness



Fig. 5 (case 3).—Maximum spread on the ninth day of illness. Note the extension of the original fan and the diffuse mottling of the remainder of the originally involved lung and also of the other lung



Fig. 6 (case 4).—Diffuse mottling with irregular blotchy areas of lightly increased density, typical of the severe form, on the eleventh day of illness. This may be present for two or three weeks before it begins to recede

that of a confluent mottled fan or rounded area, usually of homogeneous moderate density in the central portion, with the borders fading into the normal lung. It has the appearance of an exudative alveolar infiltration and is usually more localized and of more even density than the bronchopneumonias of childhood or than those which complicate adult diseases.

3. Dr. William H. Allen⁴ reported sixty-eight cases of "acute pneumonitis" in the wards of the Station Hospital, Fort Sam Houston, Texas, in 1935. He quoted Major Albert Bowen's roentgenologic description and thus summarized the disease:

Acute pneumonitis is used as the designation for a form of respiratory infection characterized by a benign course, few physical signs and roentgenologic evidence of a localized inflammatory process in the lung.

4. Dr. Hobart A. Reimann¹ reported eight cases of "atypical pneumonia" from the Jefferson Medical College and Hospital. He said:

The strikingly similar clinical features of the cases reported suggest that the condition belongs to a disease group not conforming to influenza or the usual form of the common cold but included in an undifferentiated group of infections of the respiratory tract, often called tracheobronchitis, capillary bronchiolitis or bronchopneumonia.

These eight cases were similar in many respects to our few cases of serious involvement in which the pathologic process spread rather widely through both lungs. Obviously at a large city hospital it would be only the patients with rather severe or prolonged disease who would be likely to receive hospitalization, a situation quite different from that in a university or army post. In spite of this disadvantage, Dr. Reimann shrewdly deduced that his eight cases may have represented "the severe uncomplicated form of an otherwise mild and commonly encountered infection."

CONCLUSIONS

1. In a fifteen month period quite free of pandemic influenza, we have observed among the 6,569 students at Cornell University in Ithaca an epidemic of eighty-six cases of acute infection of the respiratory tract in which roentgenograms of the chest revealed typical fan-shaped areas of increased density.

2. On the evidence presented we have concluded that these areas of density were not areas of true consolidation or pneumonia.

3. We suggest that the most descriptive title of this disease is acute interstitial pneumonitis.

4. Though this is apparently a new disease in this area, it is probably identical with the "acute influenza pneumonitis" described by Major Albert Bowen as occurring in Hawaii from 1931 to 1934, with the "acute pneumonitis" described by Dr. William H. White as occurring in Texas in 1935 and with the "atypical pneumonia probably caused by a filtrable virus" described by Dr. Hobart A. Reimann as occurring in Philadelphia in 1938.

5. In areas where acute interstitial pneumonitis is found, all patients with an acute infection of the respiratory tract with a temperature rising above 101 or 102 F. should have a roentgenogram of the chest made for the purpose of excluding pneumonitis or making possible a more accurate prognosis if that disease is present.

4. Allen, William H.: Acute Pneumonitis, *Ann. Int. Med.* 10: 441-446 (Oct.) 1936.

THE DETECTION OF TUBERCULOUS INFECTION

COMPARATIVE VALUE OF THE PATHOLOGIC EXAMINATION, THE TUBERCULIN TEST AND THE X-RAY EXAMINATION

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In the offices of large numbers of physicians in the United States, the examination for the presence of tuberculous infection has become as routine as that for syphilitic infection. Literally millions of such examinations are performed annually. The procedure now in practice has been extremely effective in leading to the detection of unsuspected pulmonary tuberculosis.

The Surgeon General of the United States Public Health Service, Dr. Thomas Parran, has seen the great value of this program and has said that the entire population of the United States should be tuberculin tested and that x-ray examination should be made of the chests of the reactors together with the other phases of the examination necessary to diagnose the existing tuberculosis in this country. Yet Lumsden, Medical Director, United States Public Health Service, has cast disfavor on the scheme following a small personal survey. This dissenting voice may have created doubt in the minds of a few who have not had experience with the test or are only beginning to use it.

As it is only the person who is infected with tubercle bacilli who becomes ill from tuberculosis, the first point to be determined in any medical examination is whether such infection exists. Three methods have been used to determine the presence of tuberculous infection, namely the pathologic examination, the tuberculin test and the x-ray examination.

THE PATHOLOGIC EXAMINATION

In 1876 Parrot observed that when tuberculous involvement is detected in the tracheobronchial lymph nodes there is nearly always a primary focus in the corresponding lung. In 145 cases examined he did not fail to find the lung focus. His student Hervouet emphasized the fact that the postmortem examination must be done with great care and that the making of a few sections of the lung would not suffice because some of the primary foci are extremely small, scarcely exceeding the size of a pin's head. Hutinel reported exceptions, that is, tuberculous foci in the tracheobronchial lymph nodes when no focus could be found in the lung, but he believed that this finding was due to the minute size of the pulmonary focus.

In 1898 Kuss said that primary tuberculosis in childhood cannot be diagnosed clinically but can be found at postmortem by painstaking examination. He pointed out that this condition is characterized by a small tubercle usually located just beneath the pleura, which nearly always results in involvement of the lymph nodes at the lung root. He found that the size of the focus in the lung varies from that of a hazel-nut to that of the head of a pin.

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In 1900 Naegeli found gross or microscopic evidence that tuberculous infection was present in 98 per cent of adult bodies which were subjected to postmortem examination.

In 1916 Ghon dissected in detail the organs of the chest as well as all the other organs and lymph nodes of 184 bodies. "Only in this way," he states, "was I able to detect slight tuberculous lesions in some cases where there had been positive tuberculin reaction." Because of their small size the detection of some of the pulmonary foci was "a very difficult task and often required considerable time." Again he says "The smallest foci were scarcely found at all in the cases with anatomical healing. This fact is of importance: it explains to us why it is often difficult to find such foci. . . ." In five of his cases the foci were located in organs outside the chest.

In 1933 Robertson published a report of his extensive pathologic examinations, which dealt largely with the lesions of the primary tuberculosis complex. He says: "To assert positively that any lesion during life or after death is or is not of tuberculous origin often reveals in the final analysis definite and occasionally humiliating errors. This is no expert, no matter what experience or special training he may have had, who has not been 'fooled' by this disease. . . . It is diagnosed as present when it is not. . . . The patient is assured that tuberculosis is not present when it is. Even macroscopic examination of excised tissues may fail to reveal its hidden presence. Orth demonstrated this fact six years before Koch announced the discovery of the bacillus of tuberculosis, when he found, by the microscope, lesions in grossly normal lymph nodes of animals fed on fodder infected with tuberculous material. The patient or his physician is told that the tuberculosis which he once had has been completely healed. Such a statement can never be made with any great degree of certainty and it is my purpose here to emphasize this fact."

Calcified lymph nodes and primary pulmonary foci have been ground and inoculated into guinea pigs by many workers to determine the presence or absence of virulent tubercle bacilli. Lubarsch, Rabinowitsch and Wegelin have recovered tubercle bacilli from as high as 50 per cent of such lesions. Opie and Aronson obtained positive results in 30 per cent of 169 bodies in which the lesions were thought to be apparently healed. Feldman examined microscopically and by guinea pig inoculation lesions of the primary complex from sixty-eight human beings. Although there was evidence of histologic activity in a considerable number, in only one was he able to demonstrate the presence of viable or virulent tubercle bacilli. He questions whether or not the evidence of histologic activity may not have been due to the presence of silica, which was demonstrated in these lesions. He finds that even morphologic studies cannot determine the presence or absence of viable or virulent tubercle bacilli in the lesions of the primary complex. Thus, apparently the infection completely dies out in a considerable number of the lesions of primary complexes and in others the bacilli remain alive and serve as a potential threat to the future health of the individual.

Sweany has established that pure bone develops around the foci in approximately 25 per cent of cases in man and that when the lesions of the primary complex are well calcified or ossified the capsule may be resorbed.

Thus the detailed pathologic examination is a highly accurate method of detecting the presence of the primary tuberculosis complex (tuberculous infection). Unfortunately the majority of them are located so remote from the surface that they are not available for antemortem examination.

THE TUBERCULIN TEST

Tuberculin prepared by different laboratories or even separate lots by the same laboratory may vary considerably in potency. Therefore extensive studies have been conducted by such workers as Dorset, Long and Seibert, who have determined that it is the protein fraction of the tubercle bacillus which sensitizes the tissues of the infected individual. Moreover, they have produced purified protein derivative. While this has not rendered old tuberculin obsolete—extremely valuable when prepared in such laboratories as that at Saranac Lake—it is a definite step forward. The intensive studies now in progress by Long and Seibert promise a standardized testing substance with a dosage which will be as effective in determining sensitivity of the tissues to tuberculo-protein as is possible to attain.

Lumsden says "Skin testing with any of the tuberculin preparations now on the market or otherwise amply available as a sole means of establishing an epidemiological index or rate of incidence of tuberculous infection in the general population of a community or region is of questionable value or definitely futile." I see no justification for this statement; a discrepancy (not as great as that reported by Lumsden) has been recognized for a long time. As early as 1893, Bang of Denmark called attention to the fact that in cattle the occasional animal which did not react to the tuberculin test had unmistakable tuberculous lesions demonstrated at postmortem examination. He said: "But the imperfections of tuberculin mentioned here are eclipsed by its good qualities. According to my experience, which is founded on a very great number of autopsies, it is in 10 per cent of the cases at most that tuberculin will be at fault and it is only in a very small percentage of these cases that the fault will be of consequence." In 1898 Reynolds said: "I do not mean to convey the impression that I consider tuberculin absolutely infallible, but I do consider it more nearly infallible than the human eye or sense of touch."

Every one knows that the Wassermann and other equally good tests are not infallible for the detection of syphilitic infection, yet no informed physician would condemn them and even call them futile because of the occasional failure.

There are certain factors absolutely necessary for the successful administration of the tuberculin test:

1. A high grade tuberculin with recently tested potency must be used.
2. For the individual who has not reacted to 0.01 or 0.1 mg. as the first dose, a second dose of 1 mg. should be administered in from forty-eight to seventy-two hours. When purified protein derivative is used, one should always employ the usual second dose for those who do not react to the first. The administration of a sufficient dosage of tuberculin is important, as a 10 to 20 per cent error may result from using only the small dose. For persons beyond middle life, larger final doses may be necessary.
3. If tuberculin is not lodged in the layers of the skin, no reaction will appear even though the tissues are sensitized to tuberculo-protein.

4. Interpretation is best made by palpation. In the absence of induration or edema no reaction should be recorded. Many one or two plus reactions have been based on areas of pinkness or redness and are not an indication of sensitivity to tuberculo-protein.

When adequate care is used in carrying out these four points the number of persons one misses who have foci of living tubercle bacilli in their bodies will be insignificant. If such care is not taken, of course, the results will not tally with previous records.

The evidence of the specificity of a good preparation of tuberculin properly administered now makes a voluminous literature:

1. One can administer the tuberculin test to large numbers of guinea pigs and find no reactors, then inoculate them with living tubercle bacilli; a few weeks later all will be reactors if the test is again administered.

2. Independently the veterinarians have conducted their investigation on tuberculin. The critics and advocates of tuberculin now active in the medical profession had their parallels in this profession forty years ago. The veterinarians have long since settled their controversy because the immediate postmortem examination of the carcass was proof positive of the specificity of the test. In the United States, tuberculosis among the 58,000,000 cattle, as manifested by the tuberculin reaction, has been reduced since 1917 to one half of 1 per cent or less in all but nine of the 3,134 counties. In 1917 there were 40,746 cattle condemned for tuberculosis under federal inspection in the United States; in 1938 there were only 2,385 cattle condemned. Was this futile? The veterinarian used the tuberculin test as the "sole criterion" of tuberculous infection.

3. A strain of tubercle bacillus with markedly attenuated virulence, known as BCG, when properly administered to man and animals is capable of sensitizing the tissues to tuberculo-protein.

4. We have observed 643 students of nursing and medicine who were nonreactors to tuberculin but who soon after exposure to patients suffering from contagious tuberculosis presented strong reactions. Boynton found that the rate of tuberculous infection among students of nursing in a general hospital service was 100 times greater than among students in the college of education, while among students in a special tuberculosis service it was 500 times greater than in the college of education. Among eighty-five students of nursing and medicine who developed lesions which could be located during life by one or more phases of the examination, not one failed to react to tuberculin.

5. When a contagious case of tuberculosis exists in a family, one finds that nearly all other members react to tuberculin. The presence of the tuberculin reaction among children in such families is so universal that the administration of the test to the children is often used in differential diagnosis. For example, a woman reported to one of our chest clinics with evidence of extensive disease in one lung. The x-ray laboratory reported advanced pulmonary tuberculosis. Tubercle bacilli could not be found in the sputum and she did not react to tuberculin. Finally her four small children were brought to the clinic but not one reacted to tuberculin. The final diagnosis was pulmonary abscess with no evidence of tuberculosis.

6. The tuberculin reaction among children often leads to the source of the infection. For example, Edwards of Cleveland administered the tuberculin test to first

grade school children and examined the adult contacts of the reactors. In 1937, 163 and, in 1938, 224 previously unreported cases of pulmonary tuberculosis were brought to light in this manner. Can any one speak of a test which results in such accomplishments as "futile"?

7. Ch'iu found that of 446 children who reacted to tuberculin at the average age of 7 years, 15 per cent had fallen ill or had died of tuberculosis ten or more years later, whereas of 772 children who were non-reactors to tuberculin at the average age of 6.6 years only 1.7 per cent had fallen ill from tuberculosis when traced ten or more years later. Can any one say that a test is "futile" which selects the potential future cases of clinical tuberculosis in this manner?

THE X-RAY EXAMINATION

When the x-rays are used as the final diagnosis of tuberculosis, certain physical limitations of this method must be held in mind else the medical scientist will join the ranks of the awe struck public to whom x-rays are still largely magic. X-rays at their best are entirely dependent on the eyesight of the viewer. Some of the physical limitations are as follows:

1. The x-ray examination usually is limited to the chest. Ghon and other pathologists have called attention to cases in which the most minute examination at post-mortem revealed no evidence of tuberculosis in the lung or hilus and yet definite foci were found in other parts of the body. Sweany has shown that about 12 per cent of the tuberculous infections are extrapulmonary. This fact immediately gives the x-rays a 12 per cent handicap.

2. On the usual single film exposed in the posterior-anterior diameter, a considerable part of the lung is obscured from view by shadows of the heart, diaphragm, and so on. Sweany has found that approximately 31 per cent of the lesions which can be detected by postmortem examination had their shadows so obscured from view on the antemortem x-ray films. Thus, an additional 31 per cent handicap must be given the x-rays in detecting tuberculous infection.

3. The x-ray examination is such a gross method that areas of disease must be macroscopic in size before they cast shadows on the x-ray film that are visible to the naked eye.

Miller's x-ray and postmortem studies of 400 cases led to the following conclusions: "With a technic of examination based upon careful study, calcification of tuberculous first infection in the thorax is demonstrable roentgenographically in only about one fourth of the existing cases. The superimposition of structures of varying density, the factors of cardiac and intrapulmonary vascular movement and the minute size of many of the calcium deposits are responsible for this. Blood vessels roentgenographed axially produce shadows which may be confused with those of calcium." Since 75 per cent of the lesions which contain calcium are not demonstrated by x-ray examination, this method cannot be set up as the standard method of detecting tuberculous infection.

Even in the small percentage of primary lesions which are located by x-ray examination it usually takes from one to several years before sufficient calcium is deposited so that it can be detected by x-ray examination. Pinner states that he has observed noncalcified primary tuberculosis complexes that were several years old and one such case in which bacteriologic evidence

of tuberculosis extended over seven years preceding death. Thus, if one were to use the x-rays to determine the presence of infection to find its source, the persons responsible for the infection would continue to disseminate bacilli or even die before their disease would be detected. On the other hand, the tuberculin reaction is definitely present from three to seven weeks after infection occurs and one can immediately seek the open case responsible for the infection. Sweany has shown that 12 per cent of the lesions found at postmortem cannot be detected by x-ray examination because they are too small or too new to cast shadows. Thus another 12 per cent handicap accrues to the x-ray examination.

4. The careful pathologic studies of Sweany have shown that many lesions of the primary tuberculosis complex become almost completely resorbed after fifteen to twenty years, thus casting no shadow on the x-ray film. There is another very definite group of primary lesions which do not form calcium deposits. This, together with those which resorb, constitutes another 25 per cent handicap for the x-rays.

Thus, according to the postmortem work of Sweany, the x-ray examination has a total handicap of 80 per cent in the detection of the lesions of primary tuberculous infection.

If the tuberculin reaction developed in only 20 to 25 per cent of animals inoculated; if it had led to the discovery of only 20 to 25 per cent of the tuberculous cattle of this nation; if it had aided us in finding only 20 to 25 per cent of infected children, certainly we would not be using it as our best standard in the detection of tuberculous infection; yet a 20 to 25 per cent effective standard has been relied on in the report of Lumsden.

5. Even the shadows we do see on the x-ray film are not diagnostic of etiology; those cast by tuberculous lesions may be identical with those of lesions of entirely different etiology. Gloyne of London says: "Thus in the case of hilus shadows an accurate phraseology was certainly needed for what we saw, but when we added the word tuberculosis, we made an inference from the observed facts which we now know to have been often wrong. A similar tendency is creeping in with regard to miliary shadows. We are apt to describe them as miliary tuberculosis. But there is a group of cases in which these shadows disappear after some months and are unaccompanied by the usual symptoms and signs of serious illness. Now miliary tuberculosis is a pathological term with a well defined meaning denoting a fatal disease and I cannot help feeling that our minds will be all the clearer if we can give to the new science of radiology a terminology of its own which cannot be confused with pathology."

Moreover, it is impossible from a shadow on the x-ray film to differentiate between shadows cast by bone, calcium or dense deposits of fibrous tissue. There are causes of calcification in the lungs and hilar region other than tuberculosis.

Frimann-Dahl and Waaler made postmortem examinations of 200 bodies which had previously had x-ray examination. They identified the primary complex in forty-two. They also studied the nontuberculous lesions which had produced shadows so easily misinterpreted for parts of primary complexes. In forty-eight cases there were ossifications and calcifications and thickened pleura not due to tuberculosis. Pieces of wood and cellulose around which calcium had been deposited were found immediately subjacent to the pleura in two cases.

Ossifications between the alveoli were found in seven. Emboli and thrombi which had calcified were found in six cases. They also found the cause of the densities on the x-ray film in some cases to be due to silicotic nodules. I have seen pieces of lead in the chest and small remains of iodized oil in the bronchial tree cast shadows which were interpreted as representing lesions of the primary complex until the history revealed the true condition.

6. Krause called attention to the gradual loss of sensitiveness to tuberculin if reinfections do not occur. On a number of occasions attention has been called to the disappearance of allergy as revealed by the tuberculin test among children at Lymanhurst. This has also been observed by those working with BCG; that is, after this substance has been administered, sensitiveness of the tissues reaches its height, following which it may wane and finally disappear as far as can be determined by the tuberculin test. It is believed in such cases that the BCG has completely died out.

When all tubercle bacilli in the lesions of the primary complex have died there remains nothing except the "shells" in which they formerly lived. Tuberculosis is no longer present, regardless of the shadows that may be seen on the x-ray film. Such persons if not reinfected apparently lose their sensitiveness to tuberculin and are therefore nonreactors.

The x-rays are limited by their very nature in two opposite ways. They fail to record or at least we fail to see shadows of all the lesions whether due to minute size or obstructions in the chest and at the same time they record shadows of nontuberculous lesions as well as those of previous tuberculous lesions which no longer harbor virulent bacilli and which have no more clinical significance than an appendicitis scar.

As long as one can submit the same x-ray film to four different roentgenologists without one knowing of the readings of the others and receive three or four entirely different interpretations and as long as one can submit a film to a roentgenologist and receive a definite interpretation on one day and a month later submit the same film to the same roentgenologist and receive an entirely different interpretation, it seems more than likely that many of the differences which have been reported with reference to calcifications are due to errors in interpretation rather than to actual differences in the pathologic condition. Assuming that films have been made by the best possible technic there remains one important essential, namely that shadows be described by a physician who knows the limitations of the x-ray examination.

RECENT REPORTS OF DISCREPANCIES BETWEEN THE TUBERCULIN TEST AND THE X-RAY EXAMINATION

Recently several reports of discrepancy between the tuberculin test and the x-ray film have been made. For example, Nelson and his associates found among 198 children who reacted to tuberculin that eighty-five (42.9 per cent) had what they considered definite roentgenologic evidence of calcification, forty-three (21.7 per cent) had questionable evidence of calcification and seventy (35.4 per cent) had no evidence of calcification. Among sixty-two children who were nonreactors to tuberculin they found what they considered definite roentgenologic evidence of calcification in twenty-seven (43.5 per cent), questionable evidence in five (8.1 per cent) and no evidence in thirty (48.4 per cent). They conclude that low grade or healed tuberculous lesions

in children may exist when the tuberculin reaction is negative or only questionably positive.

Among 1,220 children examined, Crimm and Strayer state that 619 (50.7 per cent) had primary tuberculosis as evidenced by calcification in the lungs, while among 1,998 adults so examined 447 (22.4 per cent) showed evidence of such calcification. The result of the tuberculin test is not given.

Crimm and Short reported 191 cases of children and young adults who did not react to tuberculin but who they believe had at some previous time acquired the primary infection of tuberculosis from x-ray evidence of focal areas of calcification. In seventy-five persons who two or three years before were reported as one plus or two plus reactors, they found that 18 per cent had become nonreactors. Over a period of four years they saw four patients who were previously non-reactors who became reactors.

TABLE 1—Nonreactors to Tuberculin, January 1922
Through May 1931

	Number
Incomplete or unsatisfactory examinations..	394
X-ray examination negative . .	3,483
Pleural changes . .	91
Bronchiectasis . .	34
Questionable or slight calcification	76
Slight calcification . .	23
Moderate calcification	9
Calcified nodules throughout both lungs..	2
Fibroid and calcified deposits in apex only.	1
Advanced pulmonary tuberculosis . .	2
Pulmonary abscess . .	1
Pneumonia	32
Total	4,148

Gass and his co-workers examined 1,015 white and 276 colored children from 6 to 19 years of age. They submitted the x-ray films of the chests to five different observers, among whom there was unanimous agreement "as to the presence of definite tuberculous lesions in 32.8 per cent of the tuberculin-positive reactors and 24.7 per cent of the tuberculin-negative reactors. Such lesions were noted on at least four of the five observations in 39.4 per cent of the tuberculin-positive children and 46.2 per cent of the tuberculin-negative reactors."

McKneely made an x-ray survey of 6,000 children at Hagerstown, Md., and reported that 963 showed evidence of pulmonary tuberculous infection. Among 2,837 children who were nonreactors to tuberculin approximately 13 per cent had what he considered x-ray evidence, whereas among approximately 700 children who reacted to tuberculin there was x-ray evidence in 20.6 per cent. McKneely says: "In summary, tuberculin testing followed by roentgenographic examination of the reactors in the Hagerstown school children would have missed 85 per cent of the children with tuberculous lesions which were revealed by an x-ray survey. These results seem to show also that the reaction to the tuberculin test is almost unrelated to the roentgenographic diagnosis in this group of school children. Clearly, this finding appears incompatible with much that is believed to be true about tuberculosis and the tuberculin test. The first question which may be raised concerns the accuracy and correctness of our technics, and interpretations. These have been checked as carefully as possible and to date no basic error has been found." One wonders whether man's inability to determine etiology from the x-ray film is not basic enough as far as error is concerned.

Lumsden and his co-workers examined 4,400 school children from 6 to 19 years of age in Coffee County Ala., and Giles County, Tenn. He states that in Giles County 43.2 per cent of the white school children and 25.8 per cent of the colored school children and in Coffee County only 0.6 per cent of the white school children and only 1.1 per cent of the colored school children showed lesions "regarded by the authorities generally as unquestionably healed or arrested primary lesions of tuberculosis." Among the white children examined in Giles County 46.2 per cent of the tuberculin reactors and 42.7 per cent of the nonreactors were reported to have evidence of calcium deposits revealed on their x-ray films.

If one is working in a community where approximately 100 per cent of the children have become infected with tubercle bacilli, one might expect to find about 20 per cent with evidence of the primary complexes on the x-ray film. In addition one would find similar shadows of lesions with entirely different etiology. It is possible that in some areas of this country the non-tuberculous causes of densities, such as fungous disease and silicotic nodules, are more prevalent than in others. Therefore in communities where nearly all the children are infected with tubercle bacilli and the other causes of densities on the x-ray film are prevalent a much higher percentage of shadows so often interpreted as representing the primary complex will be found than in communities where the incidence of tuberculous infection among children is low and the other causes of densities on x-ray film are rare.

Among adults there appears to be a definitely lower percentage who have shadows interpreted as calcium deposits than among children. For example, an examination of 846 students by Scheel of Oslo revealed shadows without calcification which he believed were due to deposition of fibrous tissue in 6.9 per cent of the tuberculin reactors and in only 1.6 per cent of the nonreactors. He found evidence of calcified foci in from 12.2 to 16.2 per cent of the tuberculin reactors and in 0.7 per cent of the nonreactors.

Lees examined 464 medical students at the University of Pennsylvania; 338 reacted to tuberculin and thirty-nine (11.2 per cent) showed evidence of calcium deposits on the x-ray film. Of the 126 nonreactors ten (7.9 per cent) gave evidence of calcium deposits.

Among 4,372 students who entered the University of Minnesota in the fall of 1936, 1,004 reacted to the tuberculin test. An x-ray film examination was made of 982 of these, of whom only 140 (14.2 per cent) showed possible evidence of primary complexes such as calcium deposits.

Ylvisaker and his co-workers made x-ray films of the chests of 9,301 adult employees in the home office of the Prudential Insurance Company and found that 762 (8.2 per cent) gave evidence of calcium deposits in the chest.

It is possible that the reporting of definitely smaller numbers of adults than children with evidence of calcium deposits may be due in part to resorption of the calcium, bone, and so on, which Sweany has described.

OBSERVATIONS AT LYMANHURST

At the Lymanhurst School in Minneapolis we have examined 16,824 children since 1921, many of whom have been reexamined periodically. First examinations have been made of infants of a few months and of all other ages throughout the period of childhood. We have observed the same infants and children periodically from the time of the first examination as they grew into

adulthood and have seen some of them reach the fourth decade of life. Thus we have seen the complete evolution of tuberculosis in the human body from the time the individual was exposed, following which parts of the primary tuberculosis complex were occasionally detected by x-ray film in the lung or in the hilus or in both. Among such persons we have seen the primary complex make its appearance as well as acute reinfection forms of disease, such as meningitis, pneumonia, miliary tuberculosis, pleurisy with effusion, and peritonitis. We have seen chronic reinfection forms develop, such as those involving the lungs, the kidneys, numerous bones and joints and the digestive tract.

When these observations began, it was generally assumed that all children had been infected with tubercle bacilli and that therefore the x-ray examination should bring to light evidence of calcium deposits, particularly in the hilar region in the majority. For example, in 1925 in one group of 1,412 children we reported that our roentgenologists had found evidence of calcium deposits in 1,024 (72.6 per cent) and that 55 per cent of those with evidence of calcium on the x-ray film did not react to the tuberculin test. At that time the work of several authors emphasized the fact that deposits in the lung or hilus interpreted as calcium are not always due to tuberculosis.

In 1927 we reported the examinations of 4,500 children of whom the roentgenologist had described evidence of calcium deposits in 3,155 (70.1 per cent). In these 3,155 the tuberculin reaction was present in 1,683 (53.3 per cent). The same year we reported the examinations of 1,772 children among whom the roentgenologist had reported the evidence of calcification in 1,077 (60.7 per cent). Of this number said to have calcium deposits demonstrated by x-ray film, 56 per cent reacted to the tuberculin test. The conclusion was that the discrepancies between the tuberculin reaction and

report evidence of a definite calcium deposit in the hilar region, whereas, on the next examination of the same child's chest no such evidence would be reported. Structures such as blood vessels seen on end were responsible for many of the reports of the presence of calcium in our previous examinations. About this time reports were

TABLE 3.—Examinations from June 1, 1931, Through Dec. 31, 1938

No test	12	
Total number examined.....	7,939	
Nonreactors	6,156	
Reactors	1,771	(22.3 per cent)
NONREACTORS		
No x-ray examination.....	4,987	
X-ray examination.....	1,169	
No abnormalities	1,064	
Possible calcium	74	
Definite evidence of calcium.....	18	(1.5 per cent)
Clinical pulmonary tuberculosis.....	2	
Pneumonia	11	
REACTORS		
X-ray examination	1,771	
No abnormalities	703	
Possible calcium	468	
Definite evidence of calcium.....	527	(29.7 per cent)
Primary foci in pneumonic stage.....	25	
Clinical pulmonary tuberculosis.....	34	
Pneumonia	14	

appearing in the literature calling attention to the work of others who had observed this error, notably that of McPhedran.

By 1930 the interpretations of our x-ray films were so much in error that they were really of little value in the continuation of our studies. Therefore they were reinterpreted in the light of new information.

In table 1 are grouped those who did not react to the tuberculin test and those with incomplete examination with reference to tuberculin and x-ray examination who registered in our clinic before June 1, 1931. The total group consists of 4,148 individuals, 394 of whom were not adequately examined. Thus the group with satisfactory examinations consists of 3,754 children; 3,643 (97 per cent) had no evidence of calcium deposits reported on the x-ray film, while 111 (3 per cent) had such evidence reported, although some of it was questionable. One child had definite pulmonary abscess; two had unmistakable advanced pulmonary tuberculosis. In both of them only the epidermal test was administered. It is probable that in one case desensitization had occurred, as the disease was in the terminal stage when the test was administered. In the second case such an explanation does not seem logical and, unfortunately, larger doses of tuberculin were not administered.

Among the remaining children, thirty-two had shadows in the lung parenchyma which completely disappeared on subsequent examinations. This shows the great advantage of having an opportunity to make periodic examinations. I have seen a number of such cases which on a single examination were designated as tuberculous on the basis of the x-ray shadow. No person, whether a reactor or a nonreactor to tuberculin, should ever be given a diagnosis of pulmonary tuberculosis from the shadows revealed by one x-ray examination. In not a single case of this entire group did we find a shadow in the lung which proved to represent the primary focus in the pneumonic stage.

Table 2 includes 4,737 children who reacted to tuberculin, as they registered in our clinic before June 1, 1931. However, in 134 the x-ray examination was not

TABLE 2.—Tuberculin Reactors, January 1922 Through May 1931

	Number
Changed from nonreactors to reactors.....	189
Changed from reactors to nonreactors.....	68
No x-ray examination.....	134
X-ray examination negative.....	2,995
Pleural changes (no evidence of calcification).....	124
Pleural changes with evidence of calcification.....	49
Bronchiectasis, no calcium.....	15
Bronchiectasis with calcium.....	3
Questionable calcification	233
Definite calcification	765
Calcifications in cervical or abdominal regions only.....	5
Hodgkin's disease	1
Pneumonia (no calcium)	13
Fine fibroid deposits or nodular infiltrations in apex.....	16
Primary foci in pneumonic stage.....	41
Clinical pulmonary tuberculosis (no calcium).....	24
Tuberculosis of bones and joints (no calcium).....	15
Clinical pulmonary tuberculosis (with calcium).....	37
Tuberculosis of bones and joints (with calcium).....	10
Total	4,737

the x-ray examination "may be accounted for either on the ground that the calcification is due to some healed inflammatory condition of a nontuberculous nature, to tuberculous involvement which has completely died out or to error in interpretation of shadows." When a child was reported to have evidence of calcium deposits revealed by the x-ray film in the parenchyma or hilus, slight rotation of the chest under the fluoroscopic screen examination often would obliterate the shadow. Again, on one film of a child's chest the roentgenologist would

done or was unsatisfactory. Of the 4,346 who had x-ray film examinations, 869 (20 per cent) were reported to have definite evidence of calcium deposits. Of the remainder there were 233 who had questionable evidence of calcium deposits on the x-ray film. Among this group of tuberculin reactors it will be observed from table 2 that twenty-five had clinical tuberculosis of the bones and joints and sixty-one had clinical pulmonary tuberculosis.

Because so little evidence of disease was found among our nonreactors, we have not made x-ray films of the chests of nonreactors since June 1931 unless they were demanded by the family or one or more symptoms aroused our suspicion. It will be observed (table 3) that only twelve of the 7,939 children who were examined between June 1, 1931, and Dec. 31, 1938, were not tested with tuberculin. Of those tested only 22 per cent reacted, while among those examined before June 1, 1931, 54 per cent reacted. Among the non-reactors (table 3) only 1,169 had x-ray film examinations and of these only eighteen presented definite evidence of calcium deposits. We have given no consideration whatever to those reported as having possible or probable calcium deposits demonstrated on the x-ray film except to list them. Clinical pulmonary tuberculosis was found in two of these nonreactors.

Among the 1,771 reactors (table 3), definite evidence of calcium deposits was reported in 527 (29.75 per cent), primary foci in the pneumonic stage in twenty-five, clinical pulmonary tuberculosis in thirty-four and nontuberculous pneumonia in fourteen.

As in the group examined prior to 1931 clinical pulmonary tuberculosis was found in sixty-one and since 1931 in thirty-four cases, making a total of ninety-five, all of whom were tuberculin reactors, and since nearly all of this group were in the teen age period, it is almost fruitless to make x-ray films of the chests of children even though they react strongly to tuberculin, before they reach the age of adolescence. It is nearly fruitless to make x-ray films of the chests of children who react to tuberculin to find evidence of the lesions of the primary complex. Therefore our studies have led us to look on the x-ray film of the chests of children as almost a total waste as far as tuberculosis is concerned.

However, when the period of adolescence is reached and on through the span of life, every tuberculin reactor should have an x-ray examination of the chest annually as long as no significant shadows appear and much more frequently if shadows appear which may be due to clinical tuberculosis. Those who present such shadows are subjected to complete examination, including laboratory studies of the sputum and the gastric contents for acid-fast bacilli, periodic red cell sedimentation tests, observation for symptoms, examination for abnormal physical signs, and frequent x-ray examinations of the chest to determine whether the shadow persists and if so whether it changes in size. Even bronchoscopic examination may be resorted to in arriving at the final diagnosis. Thus the diagnosis of tuberculosis often is made only with extreme difficulty; there are no short cuts, such as a single x-ray examination of the chest. Indeed, any one who makes diagnoses without utilizing all of these procedures is open to criticism by experienced physicians. Our experience at the Lymanhurst Health Center has been such that the term "x-ray diagnosis" has become obsolete. We have seen so many errors made that we now accept nothing except a complete examination of which the x-ray film is only a part.

THE RELATION BETWEEN VITAMIN A AND DARK ADAPTATION

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I. PURPOSE

Night blindness and similar visual disturbances have long been associated with the nutritional state of the body. In recent years this connection has been traced to the vitamin A of the diet¹ and has become understandable in terms of the chemical relation between vitamin A and the light-sensitive pigments of the retina.²

After the establishment of vitamin A as a factor in the visual cycle, it seemed logical to use the properties of vision for the detection of early stages in vitamin A deprivation. Such tests were made by Edmund and Clemmesen³ with visual intensity discrimination as an index and by Jeans and Zentmire⁴ with dark adaptation as a criterion. Other investigations⁵ followed and, though some of this work has been found to be perhaps more enthusiastic than critical,⁶ it showed that the original idea is probably sound and that under properly controlled conditions some visual properties may be used in diagnosing a lack of vitamin A long before it becomes clinically evident.

The measurements to be reported in this paper were made in an effort to study the behavior of dark adaptation under controlled vitamin A conditions and to ascertain under which circumstances the properties of dark adaptation are indicative of preclinical avitaminosis A.

II. DARK ADAPTATION

Dark adaptation is a familiar phenomenon. On coming from the brightly illuminated outdoors into a dimly lighted room, one can see hardly anything at first, but, as one stays indoors, objects slowly take shape, and after fifteen or twenty minutes they appear so clear that one recalls the initial visual obscurity with astonishment. The process of achieving this good vision is called dark adaptation. It was first described by Aubert⁷ in 1865 and first measured by Piper⁸ in

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1. Fridericia, L. S., and Holm, E.: Experimental Contribution to the Study of the Relation Between Night Blindness and Malnutrition: The Influence of Deficiency of Fat-Soluble A Vitamin in the Diet on the Visual Purple in the Eyes of Rats, *Am. J. Physiol.* 73:63-78 (June) 1925. Tansley, Katherine: The Regeneration of Visual Purple, Its Relation to Dark Adaptation and Night Blindness, *J. Physiol.* 71:442-458 (April) 1931.

2. Wald, George: Carotenoids and the Visual Cycle, *J. Gen. Physiol.* 19:351 (Nov.) 1935.

3. Edmund, Carsten, and Clemmesen, S.: On Deficiency of A Vitamin and Visual Dysadaptation, Copenhagen, Levin & Munksgaard, 1936.

4. Jeans, P. C., and Zentmire, Zelma: A Clinical Method for Determining Moderate Degrees of Vitamin A Deficiency, *J. A. M. A.* 102:892-895 (March 24) 1934.

5. Reviewed by Jeghers, Harold: Night Blindness as a Criterion of Vitamin A Deficiency, *Ann. Int. Med.* 10:1304-1334 (March) 1937. For more recent references see Isaacs, Jung and Ivy.⁶

6. Compare especially the following critical papers: Palmer, C. E., and Blumberg, Harold: The Use of a Dark Adaptation Technic (Biophotometer) in the Measurement of Vitamin A Deficiency in Children, *Pub. Health Rep.* 52:1403-1418 (Oct.) 1937. Isaacs, B. L.; Jung, F. T., and Ivy, A. C.: Vitamin A Deficiency and Dark Adaptation, *J. A. M. A.* 111:777-780 (Aug. 27) 1938. Griggeman, N. T., and Wilkinson, H.: Night Blindness and Vitamin A Deficiency: The Use of the Biophotometer, *Lancet* 1:905 (April 16) 1938.

7. Aubert, H.: Physiologie der Netzhaut, Breslau, 1865.
8. Piper, H.: Ueber Dunkeladaptation, *Ztschr. f. Psychol. u. Physiol. d. Sinnesorg.* 31:161, 1903.

1903. Since then it has been extensively studied, and now there exists a body of information which is sufficient to describe it quantitatively.⁹

Measuring dark adaptation involves finding the minimum light which must illuminate a given surface in order to render it visible. This threshold illumination is high when one enters a dark room and decreases as one stays in the dark. The most striking thing about this change in visual threshold is its range; it can easily cover a gamut from 100,000 units of light intensity at the beginning to 1 unit at the end of dark adaptation.

The retina is neither a simple nor a uniform structure. It possesses two kinds of receptors—rods for vague colorless vision at low light intensities and cones for acute color vision at high intensities—and these are distributed in a definite and characteristic pattern over the surface of the retina.¹⁰ Since dark adaptation is accomplished by both rods and cones, their distribution and properties determine the precise nature of the dark adaptation corresponding to any region of the retina. Unless understood, these complexities will trip the innocent investigator who is unaware of the accumulated visual knowledge of the last twenty-five years.

It would obviously be out of place to present this information here, especially since it has already been reviewed in detail elsewhere;⁹ therefore we may state categorically that there are at least six specifications which must be made in order that measurements of dark adaptation may be numerically precise and quantitatively valid. These conditions are (1) the intensity and (2) the duration of the light present before dark adaptation begins and (3) the area, (4) the retinal location, (5) the color and (6) the duration of the light used for measuring the course of dark adaptation.

In order to understand what these specifications involve, it is well to look at the measurements of dark adaptation shown in chart 1. For the moment consider only the upper set of points in the chart. They are single measurements which record the light intensity which the observer can just barely see as he stays in the dark. Time is plotted on the horizontal axis on an ordinary linear scale. Light intensity, however, is plotted on the vertical axis on a power or logarithmic scale. On such a scale 1 means 10 units, 2 means 100 units, 3 means 1,000 units, and so on. The most important reason for using a logarithmic scale is the large range of intensities covered by the data. A simple linear plot would have to be enormous to show any detail in such a range and would cramp some portions of the data and exaggerate others. Another virtue of a log plot is that a percentage error always occupies the same distance; a 10 per cent error is the same size whether applied to 1 unit or to 1,000 units.

Chart 1 shows that dark adaptation proceeds in two steps. The first is rapid and is over in a few minutes; the second is late in starting and goes on for a half hour or more. It is now well known that the rapid first adaptation records the behavior of the cones of the retina, while the delayed and slower second adaptation reports the function of the rods. When, as for chart 1, the measurements have been made with violet light, this is brought out by the sharp and easily noted color difference between those thresholds which are

determined by the cones and those made by the rods. Even a completely inexperienced observer records the fact that at the threshold the lights corresponding to the first section (solid circles in chart 1) appear violet or blue, while those composing the second section (unfilled circles) show no color at the threshold.

The six conditions under which the measurements are made influence profoundly the relative extent, the duration and even the form of the two parts of the dark adaptation curve. Thus the brightness and duration of the light adaptation which precede dark adaptation will fix the time of appearance of the cone-rod transition; after prolonged exposure to high intensities, the break may not come before fifteen or sixteen minutes, whereas after short exposure to low intensities it may come after half a minute or even less. The same is true of the color of the light used for measuring the threshold. Measured with red light, dark adaptation may show mainly the first, cone section, followed perhaps by a very slight rod section, which appears after thirty minutes; while with violet light

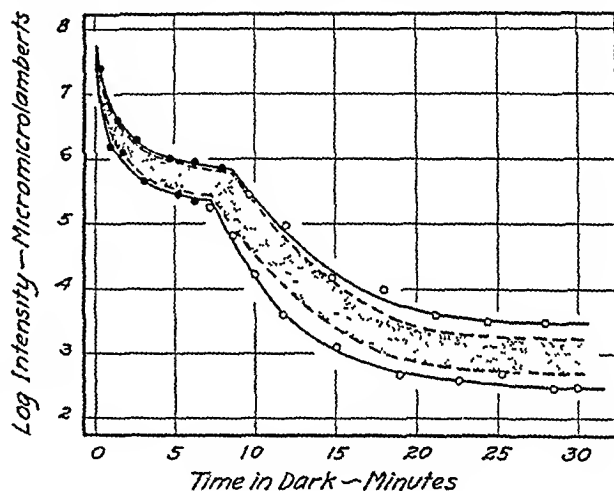


Chart 1—The course of dark adaptation in 110 normal persons. The points represent the single measurements made with two subjects yielding the highest and lowest values of the final threshold. The dotted area contains 80 per cent of the population. Note the cone primary adaptation marked with filled in circles, the rod secondary adaptation marked with unfilled circles and the cone rod transition time.

the cone portion may hardly show, and only the rod, secondary section will be dominant. Similarly the area and location of the part of the retina used in the tests share with the other factors the control of the course of dark adaptation.

III. STANDARD CONDITIONS AND APPARATUS

Since all these circumstances determine the nature and course of dark adaptation, it took many preliminary tests and a long experience with visual measurements for us to formulate the best conditions for routine measurements. The conditions we finally adopted as standard were chosen for their physiologic reasonableness.

To begin with, the precise effects of nutritional and pathologic conditions on the course of dark adaptation are not known. We therefore chose such a light adaptation that both cone dark adaptation and rod dark adaptation are separately and adequately shown in the measurements. This means a light adapting field, occupying about 35 degrees visual angle, whose brightness is about 1,500 millilamberts. The exposure

⁹ Hecht, Selig: Rods, Cones and the Chemical Basis of Vision, *Physiol. Rev.* 17: 239-290 (April) 1937.

¹⁰ Osterberg, G.: Topography of the Layer of Rods and Cones in the Human Retina, *Acta Ophth.*, vol. 13, suppl. 6, pp 1-103, 1935.

to it is for three minutes, which is long enough to produce the main effect and short enough to keep the subject from being bored.

The test field occupies 3 degrees visual angle in diameter as a compromise between a smaller field, which reports the behavior of a uniform part of the retina, and a larger field, which is more easily seen by untrained subjects. The test field and the light adapting field are viewed 7 degrees nasally with the right eye. This position was selected because at this point the population of retinal rods and that of cones are more nearly

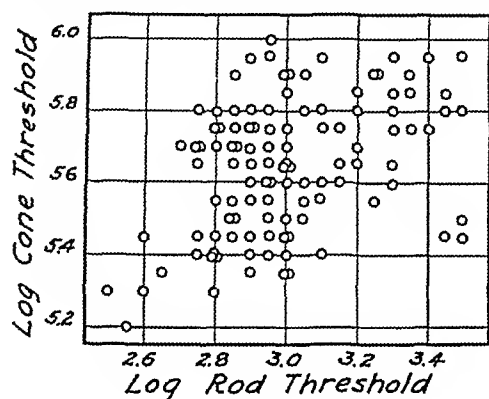


Chart 2.—Relation between final rod threshold and final cone threshold shown by 110 persons. The two thresholds are obviously connected, but the correlation is less than half perfect. As chart 4 shows, age is the biggest factor in disrupting the correlation.

equal than in the center of the retina or farther in the periphery. Moreover, the luminous fixation point used to keep the eye centered and steady is thus sufficiently far from the measuring area so as not to interfere with its function.

The measuring light is from the extreme violet end of the spectrum. This makes the rod section always maximal in range and furnishes the clear color distinction between cone function and rod function already referred to and shown in chart 1. The measuring light is exposed in flashes of one-fifth second, which is long enough to produce a good perception of the test area and short enough to be near the retinal action time.

These specifications may be duplicated by any one who will set up apparatus for controlling intensities, times, positions and areas. However, for convenience Hecht and Shlaer¹¹ have designed an adaptometer which not only incorporates these specifications but is so arranged that they can be varied in case it is necessary to investigate other aspects of dark adaptation under different but controlled conditions. This apparatus and the mode of its use have been described in detail and therefore need not be reproduced here. Throughout the present research we used an apparatus of this design and followed the recommended procedure.

In barest outline, this procedure consists of two parts. First the eye is exposed to the standard light adaptation. Then as the subject stays in the dark the intensity threshold of the selected region of the retina is measured with flashes of violet light. The exact steps in the measurements are important, and the various parts of the apparatus are concerned merely with carrying them out expeditiously and with pre-

cision. Each datum secured represents the just perceptible light intensity at a certain time in the dark, and between ten and fifteen such determinations yield a curve of dark adaptation similar to those shown in chart 1.

Measurements of dark adaptation made in this way reach a final threshold whose brightness is about one thousand-millionth of a lambert. This brightness represents approximately the appearance of a white card illuminated by a candle 1,000 feet away and corresponds roughly to an illumination of one millionth of a foot candle. The logarithms of such fractional numbers are negative and inconvenient to use. We therefore adopted a unit much smaller than the lambert; this is the micromicrolambert ($\mu\mu$ l), which is a lambert $\times 10^{-12}$, or one million-millionth of a lambert. All possible values of the threshold are thus given by positive logarithms.

IV. NORMAL VARIATION

Before making any dietary experiments, we wished to ascertain the normal distribution of the characteristics of dark adaptation. For this purpose we made routine measurements with 110 persons, most of whom had university associations, as faculty, students, wives or children. The reason for choosing university people is not merely the obvious one of convenience but rather the practical one of normality. University people are more likely to represent a well fed group, well balanced in its dietary habits. That this judgment is right will be evident later. The measurements are all single readings and first performances. This makes them comparable to measurements which are likely to be made for ordinary diagnostic purposes.

Chart 1 gives the type of result we secured. The two sets of measurements actually shown are of the two persons who yielded the extreme final rod thresholds, the highest and the lowest. The stippled band between the two dashed curves is drawn to include the data of eighty-eight people, or 80 per cent of our population. The chances are therefore quite high that

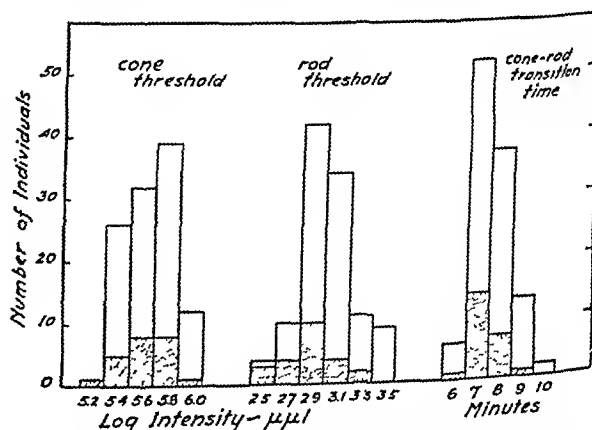


Chart 3.—Distribution of the three dark adaptation properties in the population. The stippled areas represent females. Obviously sex does not affect the distribution.

an average person when tested will show a dark adaptation curve which falls in this band.

It so happens that this stippled area in the cone region actually contains 93 per cent of all the cone measurements. This is because cone threshold and rod threshold are only partially correlated. Chart 2 records the final cone and rod thresholds of our population. It is evident that there is a general tendency

11. Hecht, Selig, and Shlaer, Simon: An Adaptometer for Measuring Human Dark Adaptation, *J. Optic Soc. America* 28: 269-275 (July) 1938. This instrument was made for us by Mr. O. C. Rudolph, 55 Van Dam Street, New York City.

for the two thresholds to vary in the same direction but that the correlation is not high. Determined in the usual statistical manner the correlation coefficient of the two final thresholds is 0.44, where 1 is a perfect correlation and 0 is no correlation.

After studying the various properties of the course of dark adaptation, such as the speed of adaptation and time for the cone-rod transition, we selected three aspects which seem to possess quantitative value as description. These are the final cone threshold, the final rod threshold and the cone-rod transition time. Chart 3 shows the distribution of these properties in our population. The cone threshold distribution appears slightly skew; the other two distributions are approximately symmetrical. The stippled areas represent females and the clear areas males. Obviously sex does not affect the distribution.

Age has some influence on dark adaptation. This is most clearly evident on the final cone threshold. Chart 4 shows that the cone threshold slowly rises with age, as evidenced by the position of the distribution maximum for the different age groups. Because violet light is used in these measurements, it is possible that the rising cone threshold is due to the yellowing of the ocular media with age. In that case the same rise in the threshold should be shown by the rods. However, the rod threshold shows no such obvious change with age. There is a subtle shift in distribution of rod thresholds with age which deserves to be pointed out, but we lay no emphasis on it. Note in chart 4 that for the 15 to 20 year group the distribution is skew to the left of the maximum, for the 21 to 25 year group it is symmetrical, for the 26 to 39 year group it is definitely skew to the right of the mode and for the 40 to 65 year group it is strongly skewed to the right. On the other hand, the cone-rod transition time is unaffected by age, the distribution maintaining the same maximum and the same degree of asymmetry throughout.

How much of the spread covered by the measurements is day-to-day variation and how much is fixed individual difference? Our experience with visual measurements indicates a maximum day-to-day intensity variation of 0.3 log unit. It may well be that for several days or even weeks of measurement of a visual function a person is consistent to within less than 0.1 log unit. Then, perhaps after a short lapse of time or quite suddenly as the result of fatigue or of a night out or even for no apparent reason, he may change and give values which fall within about 0.3 of the previous readings. Previous measurements with dark adaptation follow this expectation. However, for routine purposes we chose six subjects at random and measured them five or six times in four weeks. The resulting threshold variation for each person corresponds with previous experience, and it would serve no useful purpose to reproduce the measurements. A range of 0.3 log unit is a factor of 2 in actual light intensity. This means that, if the threshold today is 1, next week it may be 2 and it will continue to lie between these values. Considering that the total threshold change during dark adaptation is about 4 log units, or 10,000 to 1, this is a comparatively small variation.

This day-to-day fluctuation is not due to experimental or instrumental errors. In the apparatus we use, it is a simple matter to set a reading to 0.1 log unit, and a careful investigator can set it to considerably

less. The variation encountered among the population therefore represents not only the day-to-day fluctuations that any individual might be subjected to but in addition real differences between the individuals.

V. BASIS FOR INDIVIDUAL DIFFERENCES

The total spread of final rod thresholds in charts 1 and 3 is 1.0 log unit, or 1 to 10 in linear intensity units. Deducting 0.3 log unit as the expected day-to-day variation leaves 0.7 log unit as the range within which individuals vary one from another. It is naturally tempting to suppose that the distribution in this range is due to the variation of the vitamin A content of the diet and of the body and that an individual's position in the population spread depends on his normal eating habits. Our experiments do not bear this out.

Of the eleven persons whose final rod thresholds lie in the extreme upper range, we selected six for study. Their diets seemed well balanced and contained plenty of vitamin A, and none of them showed any of the usual clinical signs of A deficiency; moreover, none of

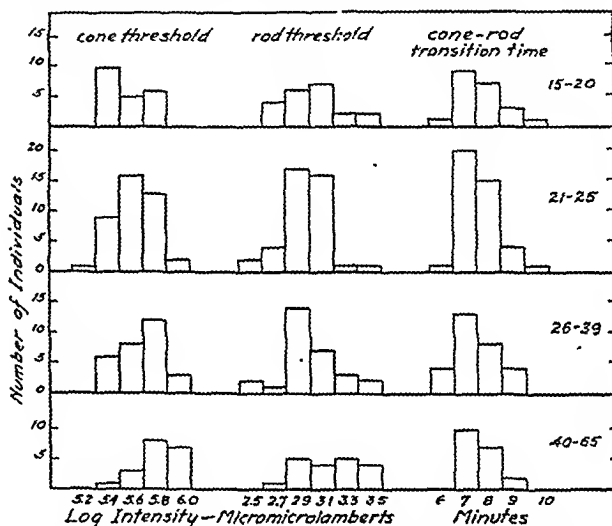


Chart 4.—Distribution of dark adaptation characteristics according to age. The cone threshold is most affected by age, the rod threshold only slightly and the cone-rod transition time not at all.

them had noticed any subjective difficulties in dark adaptation. We fed them 50,000 units of vitamin A daily for three and four weeks in addition to their regular diet. Five of the six showed no changes in their dark adaptation curves during this period, that is no change that did not fall within the normal day-to-day variation evidenced by any person whose curves are measured repeatedly. Obviously neither the daily fluctuations nor the differences between normal persons can be attributed to the daily fluctuations or the consistent differences in the vitamin A content of the diet. This is also confirmed by the case of one of the investigators in our laboratory whose final rod threshold has remained consistently among the highest despite the fact that he has eaten all sorts of supplementary vitamin A and carotene in the last two years.

Our study is thus in contrast to the investigation of 162 medical students in Boston made by Jeghers.¹² He reported that fifty of these students were subnormal in their dark adaptation. Of the fifty, at least twenty-seven were described as clinically aware of their poor dark adaptation and fifteen as possessing cutaneous

12. Jeghers, Harold: The Degree and Prevalence of Vitamin A Deficiency in Adults, *J. A. M. A.* 109: 756-761 (Sept. 4) 1937.

symptoms in addition. All those tested improved under treatment, most of them strikingly. Our own group contains sixty students, undergraduates and graduates. Their dark adaptation characteristics dominate the first two age groups in chart 3 and do not differ from those of the other groups except as age influences their distribution. Actually our six persons with high thresholds are all students, and five of them showed no change with supplementary feeding of vitamin A. The sixth will be discussed in a moment.

The differences between our subjects and those of Jeghers may be quite real; however, these differences may be exaggerated by the apparatus used by Jeghers, namely the biophotometer. Other studies with this instrument have previously failed of complete corroboration, and the instrument itself may be criticized on several grounds. In particular, Jeghers¹² reported a sharp correlation between biophotometer readings and the estimated vitamin A content of the diet of his medical students. Such a correlation has failed to appear in a similar study by Isaacs, Jung and Ivy,⁶ who have shown that the statistical errors involved in

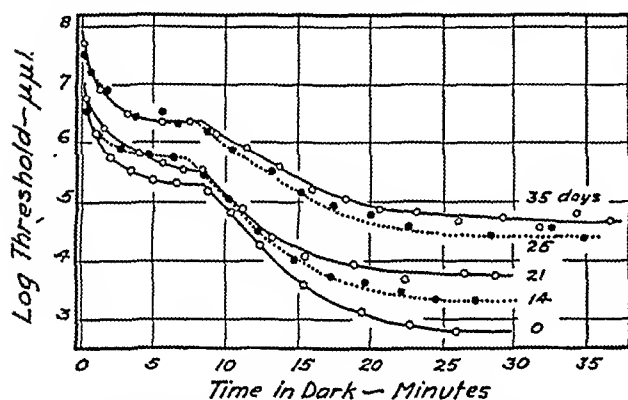


Chart 5.—Dark adaptation measurements made with one person at various times in the course of a diet practically free from vitamin A. The filled and unfilled circles merely keep the different sets of measurements apart and are smoothed by dotted and continuous lines respectively. Compare this chart with chart 1 and note how soon the data reach a level above the normal.

the use of the biophotometer are too large for such a study to be significant. The biophotometer does not incorporate in its structure and recommended procedure many of the critical specifications for measuring dark adaptation already referred to and fails to link its results with physiologic knowledge. One of the major errors is the lack of a fixation point; this failure to define the retinal area measured probably results in considerable erratic variation among individuals depending on the skill and aptitude of the subject.

In our study, even though in general the position of a normal person in the threshold spread is probably determined by other things than his diet, it is conceivable that one whose threshold is normally low may, on account of a deficient diet or of another bodily condition, be shifted to a higher position in the threshold range. Of the six subjects with high thresholds selected, one turned out to be such a person.

To begin with, his final rod threshold corresponded to $\log I = 3.5$ and his cone-rod transition time to ten minutes, both of which are maximal in our population. Like the other five persons, he had an apparently normal diet. Yet, unlike that of the others, his dark adaptation was distinctly altered by the supplementary feeding. At the end of a week his final rod threshold had fallen from $\log I = 3.5$ to 3.0 and at the end of

three weeks it reached nearly 2.5. Moreover, during this time his cone-rod transition time had shortened steadily from ten minutes to six.

It will be apparent in a moment that ordinary dietary avitaminosis A does not change the cone-rod transition time, even though it may alter the cone and rod thresholds considerably. On the other hand, avitaminosis due to cirrhosis of the liver alters not only the thresholds but also the cone-rod transition time, as Haig, Hecht and Patek¹³ showed. Apparently catarrhal jaundice also changes the cone-rod transition time.¹⁴ We are therefore inclined to think that the extreme position of this individual in the population, as well as his exceptional response to supplementary feeding of vitamin A, is due to some aberrant factor in his vitamin A metabolism which may later become apparent clinically.

VI. DIETARY AVITAMINOSIS

After having established the spread in the dark adaptation of a normal population, we studied the dark adaptation of four young men on a regimen of decreased vitamin A. First we measured their dark adaptation almost daily for two weeks while they continued their normal and apparently adequate diet. Then we restricted their diet to foods that were calculated to yield at most 150 units of vitamin A daily. In this we followed the data compiled by Daniel and Munsell.¹⁵ No special supplements were given of the other vitamins, because we wished to imitate the conditions under which dietary avitaminosis A would most commonly become established. The diet was maintained for about forty days, after which all four men returned to their normal food habits. Two were given daily supplements of 50,000 units of vitamin A for about six weeks afterward.

In studying the data during this experiment we followed the various properties shown by the dark adaptation curves. In particular we wanted to discover how the three selected characteristics shown in chart 3 behaved during the tests, because in the experiment with dietary avitaminosis A made by Jeghers¹² on himself the measurements were performed with inadequate apparatus and procedure and failed to show what actually happened to the course of dark adaptation. In the recent and similar experiment reported by Wald, Jeghers and Arminio,¹⁶ made since our preliminary notices, the procedure and apparatus have been changed to render the results more revealing of the properties of dark adaptation.

Chart 5 shows five curves of dark adaptation made with one of our subjects during different stages of the deficient diet. Of the three critical properties it is apparent that both the cone thresholds and the rod thresholds are affected by vitamin A deprivation. Rod vision is affected more than cone vision, as evidenced by the more rapid and extensive rise of the rod section during the diet. This confirms the work of Haig, Hecht and Patek,¹³ who found more extensive changes in rod function than in cone function in the dark adaptation of patients with cirrhosis of the liver. It is confirmed by the measurements of Wald, Jeghers and Arminio.¹⁶

13. Haig, Charles; Hecht, Selig, and Patek, A. J.: Vitamin A and Rod Cone Dark Adaptation in Cirrhosis of the Liver, *Science* 87: 534-536 (June 10) 1938.

14. Haig, Charles: Personal communication to the author.

15. Daniel, E. P., and Munsell, H. E.: Vitamin Content of Foods, Miscellaneous Publication 275, United States Department of Agriculture, 1937.

16. Wald, George; Jeghers, Harold, and Arminio, Joseph: An Experiment in Human Dietary Night Blindness, *Am. J. Physiol.* 123: 732-746 (Sept.) 1938.

Differing from the clear effect of the diet on the cone and rod thresholds is the complete lack of effect on the cone-rod transition time; this remained the same during all the vicissitudes of the diet for all four subjects.

The parallel behavior of rod and cone functions is shown in chart 6, which records the results with the two subjects who were given supplements of vitamin A after their return to a normal diet. The data of J. M. are about average for the four subjects, while L. W. represents the extreme effects. Each point in chart 6 is the final threshold either of the cone section or of the rod section of such curves as those in chart 5. The thresholds of the last two runs on the normal diet are shown above the diagonally shaded area on the time axis of chart 6; the clear area records the duration of the deficient diet and the black area the subsequent normal diet, supplemented as already described. It is not necessary to stress the similarities of the changes in cone and rod vision. The results confirm those of Haig, Hecht and Patek for the cone and rod thresholds during vitamin A therapy of alcoholic subjects with cirrhosis and are in turn corroborated by Wald, Jeghers and Arminio's study of one instance of dietary avitaminosis.

The important thing which chart 6 brings to light is that, as measured by dark adaptation, the presence of a dietary avitaminosis becomes evident after the very first day of the absence of vitamin A in the diet. Because of the normal day-to-day variation no reliance can be put on such a single early measurement, but the rise in threshold continues steadily and in less than a week of vitamin A lack the rod and cone thresholds in chart 6 have mounted well beyond their daily fluctuations, and a conclusion of decreased visual function can be reached with reasonable certainty. Note particularly that after about ten days of the diet the rod threshold has risen beyond the commonly encountered range included in the band in chart 1 and that a few days later it has reached a value which is higher than the extreme found in only 3 per cent of our normal population. This clearly indicates the normal character of our own population, since so short a period of deficiency sends the measurements beyond the common range.

During this period of a deficiency diet our subjects were instructed to report any subjective or other symptoms noted; with one exception none were reported, though at least one subject did a fair amount of night driving. The one report was made by L. W. toward the end of the period, when he recorded that he had collided with a wall in his home and was surprised that he had not seen it. Evidently most night illumination is well above the threshold of vision.

The return to a normal diet with or without daily supplements of vitamin A did not result in the spectacular recovery of the visual function reported by Edmund and Clemmesen³ and by Jeghers.¹² As chart 6 shows there is a slightly rapid drop in threshold at first, but this is followed by a gradual decrease in threshold, and it took about two months for our subjects to return to the normal range.

Several times after the administration of a dose of vitamin A we followed the dark adaptation of an experimental subject at intervals during the day, but we observed no striking change. Chart 6 shows one such instance, which is perhaps the only effect that we could call a positive one. It concerns the three points in the rod data of L. W. above the narrow black area. This records a single administration of 100,000 units of

vitamin A, and the points above it show the cone and rod thresholds determined in the usual way before the dose and three and six hours after it. The drop in rod threshold is about 0.4 log unit, which, considering the variation shown by L. W. during the remainder of the experiment, is nothing to be certain about and is in a different category from the almost immediate drop to normal reported since by Wald, Jeghers and Arminio.¹⁰ A possible reason for this divergence in results may be that their subject was given supplementary vitamin B during the deficient diet, while ours took only the amounts present in the restricted diet. But this is not the case with the dramatic recoveries reported by Edmund and Clemmesen.³ Further work will be necessary to clear up this discrepancy.

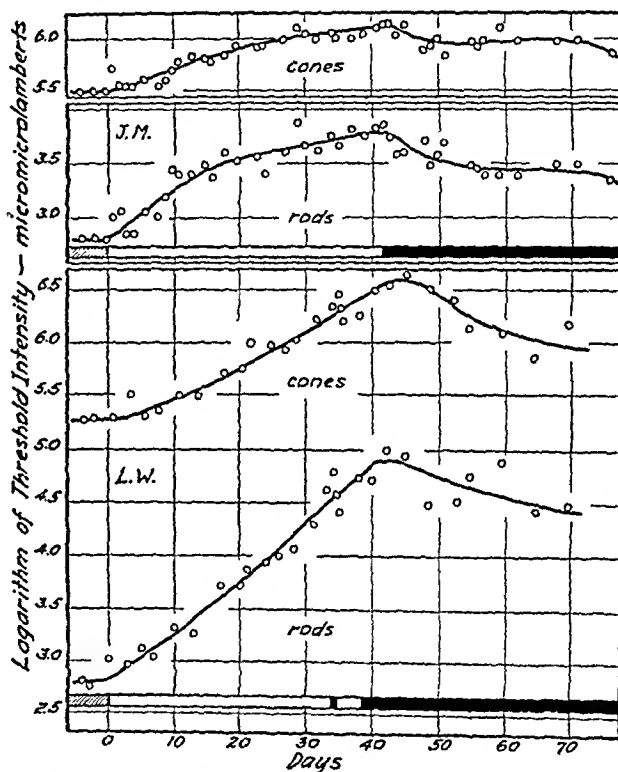


Chart 6.—The final cone and rod thresholds of two subjects on a diet nearly free from vitamin A. The diagonally shaded part represents the normal diet, the clear part the diet free from vitamin A and the black part the normal diet plus 50,000 units of vitamin A daily.

VII. DARK ADAPTATION AND DIAGNOSIS

As a result of these observations we feel certain that measurements of dark adaptation when carried out under properly standardized conditions can be used as an aid in the determination of the vitamin A condition of the body. Normal dark adaptation means a normal vitamin A content of the body, and an abnormal dark adaptation means a disturbance in the vitamin A content.

What normal is remains to be defined precisely, but this definition must be made by others. At present we may take it to mean the dark adaptation and vitamin A content of ordinarily well nourished, healthy persons such as we chose for our survey. It may well be that the common, normal dark adaptation can be improved by supplementary feeding of vitamin A. Our own attempts in this direction have not been successful, but they lasted only from three to four weeks, and more prolonged supplementation may be necessary. How-

ever, even if the commonly found dark adaptation could be improved in this way, it remains to be shown that improvement is desirable. For the present therefore normal had better be accepted in its ordinary usage.

When the dark adaptation of a person is found to be abnormal, it may mean either that his retina is not adequately supplied with vitamin A or that his visual apparatus is defective. Such defects may be congenital, like the absence of cone or rod function, or they may be acquired pathologic disturbances. When these genetic and pathologic possibilities have been excluded, one must next determine the basis for the lack of retinal supply of vitamin A. It may be the diet, in which case the remedy is simple. It may, however, be some other link in the metabolic chain from diet to retina, such as the liver, in which case other signs must be looked for.

It is these possibilities which make us doubtful of the recommendation by Wald, Jeghers and Arminio¹⁶ that the final rod threshold alone may be adequate as a diagnostic sign. Since the final cone threshold also changes during avitaminosis—dietary and pathologic—the recognition of a change in its value serves as a corroboration of the rod data. Moreover, it is not the final threshold

way the time for the cone-rod transition gradually shifts to normal. It may well be that this difference in behavior of the cone-rod break is purely a matter of short period avitaminosis versus prolonged deprivation. This in itself would be of significance in diagnosis. For such reasons we feel that it is better to determine the dark adaptation curve as a whole rather than just the position of the final rod threshold.

These reasons apply equally well to the calls that are sure to be made for an apparatus for rapid diagnosis. This is a desirable trend, especially for extensive survey purposes, but we hope that it will not be acted on soon. A rapid procedure can consist only of a shorter light adaptation followed by the determination of the time to reach one or two fixed intensities during dark adaptation. To be reached rapidly these fixed points must be on the cone curve, so that one will lose the value of the cone-rod transition time and of the final rod threshold as aids in diagnosis. It might seem that if one started with a low enough intensity of light adaptation the resulting adaptation would be purely a rod function even if rapidly made. However, for the low light adaptation to be effective it must be preceded by a preliminary period of dark adaptation, which defeats the aim of a quick test. In short, a rapid test can measure only cone adaptation, and too little is known at present of the effects of disease and diet on dark adaptation for any one to select with confidence a point on the curve for use as a fixed criterion. We therefore urge, for a while at least, that authors performing clinical and physiologic investigations with dark adaptation and vitamin A record the whole curve of dark adaptation in their procedure.

SUMMARY

The dark adaptation of a university population of 110 persons, when measured under standardized conditions, shows three properties which are useful quantitatively: the final cone threshold, the final rod threshold and the time for the transition from cone function to rod function. The distribution of these properties is not affected by sex. Age definitely increases the cone threshold but affects the rod threshold only slightly and the cone-rod transition time not at all.

The range over which these properties vary in the population is composed partly of day-to-day variation and partly of individual difference, the latter causing much the wider spread. Individual differences were not the result of differences in the vitamin A content of the diet, and with a solitary exception no significant changes were produced by supplementary vitamin A feeding of persons with the highest thresholds.

Four young men when deprived of dietary vitamin A responded by a steady rise of both cone and rod thresholds which was apparent almost from the first day after the removal of vitamin A from the diet. After about two weeks' deprivation they showed thresholds above any values normally found in the population; their thresholds continued to rise so long as the dietary deprivation was maintained. The return to a normal diet with or without supplementary vitamin A resulted in an initial small rapid drop in threshold followed by a gradual decrease; nearly two months was required for the subjects to return to normal.

Measurements of dark adaptation when made under critically standardized conditions can be used as an aid in the diagnosis of avitaminosis A produced not only by a lack in the diet but by a functional disarrangement in the flow of vitamin A from diet to retina.

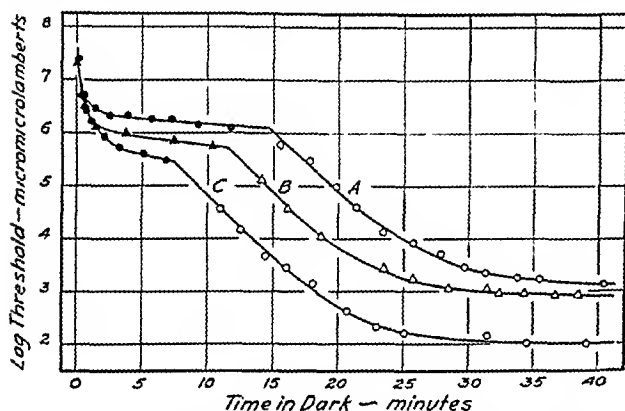


Chart 7—The dark adaptation of a patient with cirrhosis of the liver, taken from the preliminary report of Haig, Hecht and Patek.¹⁵ The conditions of measurement were slightly different from those here used but near enough for adequate comparison. Curve A was obtained when the subject was on an ordinarily adequate diet, while curves B and C were obtained after 105 and 127 days of intensive vitamin A therapy. Note especially the decrease in cone-rod transition time, as compared with its stationary position in the experiment with dietary avitaminosis recorded in chart 5.

alone which changes but the whole position of the dark adaptation curve on the intensity axis, and it is with much more confidence that one can conclude from the curve as a whole rather than from the position of its final point.

More significant than either of these reasons is the fact that other properties of dark adaptation are also subject to change, and it may be that further study will show characteristic disturbances of adaptation resulting from various diseases. Thus simple dietary avitaminosis does not change the time of the cone-rod transition point, whereas severe cirrhosis of the liver delays its appearance to almost twice the time, even though the final thresholds may be affected to the same extent in the two instances. We think this so important that we reproduce in chart 7 the curves from Haig, Hecht and Patek's study of dark adaptation in an instance of cirrhosis of the liver. Curve A was obtained when the subject had been on a normally adequate diet for three weeks, while curves B and C were obtained after 105 and 127 days of intensive vitamin A therapy. Compare this chart with chart 5 and note especially the

THE ENDOCRINE IMPLICATION OF
JUVENILE CHONDRO-EPIPHYSITIS

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DETROIT

Juvenile chondro-epiphysitis is described as an alteration in shape of the developing epiphyses associated with an apparent aseptic necrosis. Pathologically there may be rarefaction or even cystlike formation and degeneration. Clinically there is possibility of eventual deformity. Roentgenographically it is characterized by the following changes in the developing osseous centers: diminution in size, decrease in density, rarefaction, fragmentation, irregularity of the ossification contour and in general a fuzzy, ragged appearance of the chondro-epiphysial structures. Depending on the various structures showing such x-ray changes, almost innumerable proper or descriptive names have been employed. This conglomeration of proper names is confusing in conditions which, we think, are identical and have the same etiology.

The suggested etiology up to the present time has been entirely theoretical without any modicum of fact. The current popular impression leads one to believe that it is the result of some inflammatory reaction or blood vessel anomaly resulting in poor vascular nourishment. It also has been thought that it is a uni-epiphysial disturbance and that clinically it is associated with pain and swelling.

The significance of this publication is an attempt to prove that juvenile chondro-epiphysitis is due to an endocrine imbalance, specifically to a primary or secondary hypothyroidism in which the tissue differentiating factor is absent, that it is a generalized process involving one or more of the developing chondro-epiphysial structures and that it is at least incipiently asymptomatic.

Engelbach some twenty years ago pointed out the value of the roentgenographic study for osseous development in clinical endocrinology. It ranks today as one of our most useful diagnostic procedures. In the younger age group, from birth to 8 years, it pertains specifically to thyroid function and is related to the time of appearance of the various centers. A delay in appearance of the centers is pathognomonic of a hypothyroid state due to the absence of this same tissue differentiating factor. Certainly in this age group the x-ray by far outranks the basal metabolic rate for accuracy because of the evident difficulty in evaluating the latter test in younger children with the ordinary clinical apparatus available.

In the older age group, from juvenility to completion of adolescence, the epiphyses are all present and in a fair state of development. In this period delayed or advanced union gives visual x-ray evidence of gonadal function, early union being indicative of premature adolescence or sex maturity, delayed union being indicative of a gonadal hypofunction.

In 1931 we began to do routine x-ray studies on all children with suspected endocrinopathies, following the plan originally devised by Engelbach and his colleagues Tierney, MacMahon and Shelton.¹ Hence not one joint

but from two to four were roentgenographed, depending on the age of the patient. Very early in our studies of endocrine dwarfism we were struck by the frequency of single or multiple involvement of the chondro-epiphysial structures and so originally reported our observations.² It soon became apparent that this condition was not peculiar to dwarfism but was being seen with as great or greater frequency in other endocrine conditions displaying signs of hypothyroidism.

The basis for this report is the study of (1) a group of 258 clinically proved endocrinopathic patients in the age range of 8 to 15 years and (2) a control group of ninety-nine assumed normal children in the same age group. Out of the 258 endocrinopathic patients studied ninety-one, or 35.2 per cent, showed a chondro-epiphysial disturbance. Two hundred and eighteen of this group displayed clinical evidence of primary or

TABLE I—Site of Occurrence of Osteochondritis

Site	Number of Cases in This Series	Original Reporter
Trochlea of the humerus	44	
Epiphysis of os calcis	40	Haglund, 1907
Tibial tubercle	26	Osgood, 1903; Schlatter, 1903
Olecranon	11	
Greater trochanter of femur	8	
Lesser trochanter of femur	1	Monde Felix, 1922
Head of femur	5	Legg, Calvé, Perthes, 1910
External condyle of humerus	4	
Capitulum of humerus	3	Panner, 1927
Patella	3	Kohler, 1908
Tip of acromial process	1	
Distal epiphysis of tibia	1	Stein, 1922
Head of radius	1	
Distal epiphysis of radius	1	
Distal epiphysis of ulna	1	Burns, 1931
Tarsal scaphoid	1	Kohler, 1908
Head of humerus	1	Hass, 1921
Greater tuberosity of humerus	1	Hass, 1921; Lewis, 1925
Heads of metacarpals	1	Manclaire, 1927
Iliac crests	1	Buchman, 1925
Upper end of tibia	1	Ritter, 1929
Astragalus	1	Monchet, 1923
Accessory patellar centers	1	Larsen, 1921
First metatarsal	1	Wagner, 1930
Head of second metatarsal	1	Freiberg, 1914
Head of fifth metatarsal	1	Iselin, 1912
Vertebral epiphyses	1	Scheurman, 1921
Vertebral body	1	Calvé, 1926
Sternal end of clavicle	1	Friedrich, 1924
Internal condyle of humerus	1	Legg, 1930; Lohr, 1930
Carpal scaphoid	1	Preiser
Medial sesamoid of first metatarsal	1	Renander, 1924
Os tibiale externum	1	Haglund, 1908
Iliopubic junction	1	Odeberg, 1924; Van Neck, 1924

secondary hypothyroidism, such as roentgenographic evidence of delay in osseous development, decreased basal metabolic rates, increased blood cholesterol or developmental delay. The number of hypothyroid cases showing chondro-epiphysial disturbance was eighty-five, or 39.0 per cent; in other words, all but six cases of chondro-epiphysitis were associated with hypothyroidism. Eight hundred and ninety-four joints were roentgenographed, an average of 3.46 roentgenograms per patient. It is believed that the incidence would have been materially increased if more or if all joints had been roentgenographed as a routine. Thirty-eight, or 41.7 per cent, of the ninety-one showing involvement showed multiple epiphysial disturbance. An unusual observation in table I is the most frequent involvement of the trochlea of the humerus. More than casual survey of the literature failed to reveal chondro-epiphysitis

2. Engelbach, William, and Schaefer, R. L.: *Endocrine Dwarfism*, J. A. M. A. 103: 464-468 (Aug. 18) 1934. Engelbach, William; Schaefer, R. L., and Brosius, W. L.: *Endocrinology* 17: 250-262 (May-June) 1933. Engelbach, William, and Schaefer, R. L.: *ibid* 18: 387-392 (May-June) 1934. Schaefer, R. L.: *ibid* 20: 64-71 (Jan.) 1936.

1. Engelbach, William: *Endocrine Medicine*, Springfield, Ill. C. C. Thomas, 1932.

in this developing osseous structure. There were only three patients in the entire group who had any symptoms referable to the osseous involvement; two were referred by the orthopedic collaborator and one by a pediatrician,³ who recognized the possibility of an associated endocrine factor as the cause of the chondro-epiphysitis. It is well to emphasize here that all the



Fig 1—Left: chondro-epiphysitis of tarsal scaphoid (Köhler's disease); right: after fifteen months' treatment with thyroid extract at tolerance

patients in this group receive a careful routine diagnostic survey including history, physical examination and laboratory studies such as confirming basal metabolic

TABLE 2—Incidence of Chondro-Epiphysal Disturbance in Endocrinopathies: Age Group 8 to 15 Years

	Number Studied	Cases Showing Chondro-Epiphysal Disturbance		Extent of Epiphysal Involvement		
		Number	Per Cent	One Epiphysis	More Than One Epiphysis	Per Cent Showing Multiple Epiphysal Involvement
Endocrinopathies.	258	91	35.2	58	38	41.7
Patients with evidence of hypothyroidism.	218	85	39.0	49	36	42.3
Patients without ascertained evidence of hypothyroidism.	40	6	15.0	4	2	33.3

rates, urinalysis, blood count and blood chemistry studies including sugar, nonprotein nitrogen, cholesterol, calcium and phosphorus.

Our control group study was made possible at the Anatomical Laboratory and Associated Foundations of Western Reserve University⁴ through the courtesy of the late Dr. T. Wingate Todd.

The records of ninety-nine children who fulfilled our requirements as being free from endocrine imbalance were placed at our disposal for study. The age range was the same as of the endocrinopathies studied. These children are referred to the foundation for study only after they have been certified by their family physician or pediatrician as being free from gross physical or

mental defect and from behavioristic problems. No particular type of clinical examination is designated, but the physician is required to ascertain that the child is in a good state of organic health and shows no clinical evidence of metabolic defect. Roentgenographic studies with a view of bone age assessment are made as a routine at yearly intervals, or oftener if the child is under 5 years. X-ray films of six areas are made: the hand, elbow, shoulder, hip, knee and ankle. The majority of the files consulted showed at least four yearly studies entailing twenty-four x-ray films; a few had had seven studies a year or a total of forty-two films, and it was decidedly in the minority that there were only one or two studies a year. All areas are roentgenographed in the anteroposterior and lateral positions. An approximate total of 2,200 films was viewed.

Of the group reviewed only seven, or 7 per cent, showed evidence of chondro-epiphysitis.

At this time our studies are not sufficiently advanced to give any imposing factual data with regard to follow-up x-ray films after treatment. However, in eight cases so far studied a complete return to normal bone detail roentgenographically has been obtained by the administration of a fully tolerant and maintained dose of thyroid extract. Zuck⁵ in 1933 reported that the restorative process could be hastened by endocrine therapy. That normality can result without treatment is readily admitted, as we are aware that not infrequently mild endocrine imbalances spontaneously cor-



Fig. 2—Left: chondro-epiphysitis of the tibial tubercle; right: after twelve months' treatment with thyroid extract at tolerance. Note improvement in the bony detail of the epiphysis and disappearance of the fragmentation and irregularity in both cases

rect themselves. It is suggested, however, that such x-ray evidence is a definite indication for thyroid therapy.

CONCLUSION

1. A group of 258 endocrinopathic patients in an age range of 8 to 15 years was studied: ninety-one, or 35.2 per cent, displayed single or multiple evidence of chondro-epiphysitis; eighty-five of the ninety-one showed clinical or laboratory evidence of primary or secondary hypothyroidism.

3. Dr. C. L. Douglas of Detroit

4. Aid was received from Mr. Howard H. Grady, Dr. Todd's assistant

5. Zuck, T. T. J. Pediat 3: 424-433 (Sept.) 1933

2. A control group of ninety-nine nonendocrine patients in the same age range showed only seven, or 7 per cent, cases in which there was involvement of chondro-epiphysial structures.

3. Chondro-epiphysitis is of endocrine origin, specifically due to a primary or secondary hypothyroidism, usually asymptomatic and, to a degree, undoubtedly generalized.

4. Chondro-epiphysitis is a pathognomonic sign of hypothyroidism.

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DIPHTHERIA IMMUNITY IN CHICAGO

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Although diphtheria mortality and morbidity have been gradually decreasing in most parts of the United States for the past twenty-five years, they have not been reduced to the level which it was hoped would be attained. Antitoxin, control of carriers and the Schick test were important. The discovery of toxoid added new impetus to the efforts to control this disease. It was believed that the inoculation of a large proportion of the child population would result in almost complete eradication of diphtheria.

The results obtained with the use of toxoid did not, however, approximate expectations. The present study explains to some extent this failure.

In Chicago, until 1931, three 1 cc. doses of antitoxin at weekly intervals were used for diphtheria immunization. In 1931 plain toxoid, two 1 cc. doses at weekly intervals, was employed. From 1932 to 1934 alum toxoid, two 1 cc. doses at weekly intervals, was used; from June 1934 to August 1934 a 1 cc. dose of alum precipitated toxoid was used; from Aug. 1, 1934, to January 1935, two 1 cc. doses of alum toxoid at weekly intervals were given; from January 1935 until late in 1936 a 1 cc. dose of alum precipitated toxoid was again used. Since that time we have employed three doses of plain toxoid given a month apart, the first dose 0.5 cc. and the other two doses 1 cc. each.

Before a change was made from one type of preparation to the other, experimental tests were carried out on groups of at least 1,000 children each. The children were inoculated with the various preparations, and Schick tests were made at intervals of from two to six months to determine whether protection against diphtheria had been obtained. In other words, the determination of the type of preparation to be used was based on the Schick testing of inoculated children, together with evidence obtained from similar studies carried out elsewhere.

Table 1 reveals that diphtheria mortality and morbidity reached a low level in 1933. After that time there was a gradual rise. The levels, however, did not nearly approach those of the years prior to 1933. The reduction in 1933 was the result of widespread inoculation with toxoid of children in the city of Chicago.¹

1. Bundesen, H. N.; Fishbein, W. I., and Niblack, H. C.: Diphtheria Control in Chicago, J. A. M. A. 100:1093 (April 8) 1933.

Since that time the number of inoculations each year have been at least 80 per cent of the number of children born.

We therefore believe that, as far as the number of children inoculated is concerned, we are taking the steps necessary to control diphtheria adequately. Failure to maintain the low rates of mortality and morbidity obtained in 1933 must consequently be ascribed to the fact either that inoculated children are not rendered immune or that if they do become immune this immunity is lost with the passage of varying intervals of time.

In order to determine what has been occurring with the groups of children inoculated with the various preparations employed in Chicago, a study was undertaken in 1936. Children inoculated with these different preparations were selected of as nearly the same age as possible. The ages at the time of testing varied generally between three and seven years. In the group that received toxin-antitoxin, the children were somewhat older, that is between 9 and 13 years. Those who received three doses of toxoid at monthly intervals for the most part were between 1 and 2 years of age. A record was kept of the intervals between the time the inoculation for the prevention of diphtheria was given

TABLE 1.—Diphtheria Mortality Rate per Hundred Thousand of Population

Years	Cases	Deaths	Death Rate
1912.....	7,288	953	41.4
1913.....	8,593	968	41.1
1914.....	7,071	767	31.8
1915.....	5,863	679	27.6
1916.....	6,980	787	31.3
1917.....	10,290	1,229	47.8
1918.....	5,708	721	27.5
1919.....	6,361	592	22.1
1920.....	7,761	630	23.1
1921.....	9,313	678	24.4
1922.....	7,367	564	19.9
1923.....	5,836	366	12.7
1924.....	3,672	216	7.4
1925.....	2,926	241	8.1
1926.....	2,540	224	7.2
1927.....	4,123	442	13.8
1928.....	4,880	457	14.0
1929.....	6,012	513	15.4
1930.....	4,962	411	12.1
1931.....	3,146	215	6.2
1932.....	1,266	68	1.9
1933.....	154	9	0.3
1934.....	327	41	1.2
1935.....	762	83	2.4
1936.....	614	87	2.5
1937.....	655	84	2.3

and the time at which blood was drawn for the determination of the antitoxin content. Antitoxin titrations were determined by the Fraser modification of Romer's technic,² except that white guinea pigs were used instead of rabbits. The children were given a Schick test immediately after blood was drawn for the antitoxin determination. This was done because the Schick test in itself is known to stimulate the formation of antitoxin in the blood.

RESULTS

Group 1. The children in this group had received three injections of toxin-antitoxin a week apart during 1930. The children ranged in age from 3 to 7 years at the time of the injection, the majority being 5 years of age. The ages at the time the Schick tests were done ranged from 9 to 13 years. In the majority of

2. Fraser, D. T.: Tr. Roy. Soc. Canada (Sect. V, Biol. Sc.) 25: 175 (May) 1931.

instances the blood was drawn and the Schick test done about six years after inoculations had been given.

The Schick tests gave negative results in all except two cases. Both of these children were 5 years of age at the time of the inoculation and 11 years of age at the time the Schick test was done. Thus, of 125 total children in the group, 123 showed negative Schick tests.

Table 2 shows the results of the antitoxin determination of these 123 Schick-negative children. Of the two children who showed positive Schick tests, one had less than $\frac{1}{500}$ unit of antitoxin per cubic centimeter of blood, while the other had between $\frac{1}{500}$ and $\frac{1}{250}$ unit of antitoxin.

Group 2. This group was made up of children who had been given plain toxoid—two doses at weekly intervals—during 1932. The children were about 5 years of age at the time of inoculation and about 9 years of age at the time the blood was drawn and the Schick test done.

There were 125 children in this group; 106 were Schick negative and nineteen Schick positive. Of these nineteen Schick-positive children twelve had less than $\frac{1}{500}$ unit of antitoxin per cubic centimeter of blood.

Group 5. In the latter part of 1936 and in 1937 a group of 107 children were given plain toxoid, three doses at monthly intervals. The ages of the children varied from 8 months to 2 years at the time of inoculation. Blood was drawn for antitoxin determination and the Schick test was done on this group in the early part of 1938, which was from one to one and one-half years after the inoculations were given.

In this entire group of 107 young children there were none who showed positive Schick test reactions—all were Schick negative. The antitoxin determination of these children can be seen under group 5 in table 2. Schick test studies were carried out on a large number of the children in each of the five groups during 1936, 1937 and 1938.

In group 1, in 1936 and 1937, Schick tests were done on a group of 583 children ranging in age from 10 to 15 years, who were given antitoxin, three doses a week apart, prior to 1931. Of this group of 583 children 546, or 93.6 per cent, showed negative Schick test reactions and thirty-seven, or 6.4 per cent, were positive.

In group 2, Schick tests were done on a total of 829 children ranging in age from 10 to 15 years, who had

TABLE 2.—Diphtheria Antitoxin Content of Children with Negative Schick Reactions

Units of Diphtheria Antitoxin per Cc. of Blood Serum	Group 1		Group 2		Group 3		Group 4		Group 5	
	Number of Children	Per Cent of Total Specimens	Number of Children	Per Cent of Total Specimens	Number of Children	Per Cent of Total Specimens	Number of Children	Per Cent of Total Specimens	Number of Children	Per Cent of Total Specimens
1: 10 or more.....	73	63.4	53	50.0	62	48.1	33	29.2	79	73.8
1: 25 to 1: 10.....	14	11.4	14	13.2	19	14.7	16	14.2	17	15.9
1: 50 to 1: 25.....	8	6.5	9	8.5	7	5.4	16	14.2	8	7.5
1: 100 to 1: 50.....	7	5.7	9	8.5	14	10.9	15	13.3	1	0.9
1: 250 to 1: 100.....	4	3.3	7	6.6	10	7.8	17	15.0	2	1.9
1: 500 to 1: 250.....	5	4.1	6	5.7	7	5.4	12	10.6	0	0
Less than 1: 500 ..	7	5.7	8	7.5	10	7.8	4	3.5	0	0
Total.	123		106		129		113		107	

Group 1: Toxin-antitoxin 1 week, 3 doses.

Group 2: Plain toxoid, 1 week, 2 doses.

Group 3: Toxoid 0.2 per cent alum added, 1 week, 2 doses (not precipitated).

Group 4: Alum precipitated toxoid, 1 dose.

Group 5: Plain toxoid, 3 doses, monthly intervals.

four had between $\frac{1}{500}$ and $\frac{1}{250}$, two had between $\frac{1}{250}$ and $\frac{1}{100}$ and one had between $\frac{1}{100}$ and $\frac{1}{50}$.

Group 3. This group consisted of children who were given two doses of alum toxoid, not precipitated, one week apart. These children were inoculated between 1932 and 1934. Their average age at the time of inoculation was between 5 and 6 years. The blood was drawn and the Schick test done when the children were between 7 and 9 years of age.

Of these 145 children, sixteen showed positive Schick tests and 129 showed negative Schick tests. Of those who showed positive Schick tests, seven had less than $\frac{1}{500}$ unit of antitoxin per cubic centimeter of blood and nine had between $\frac{1}{500}$ and $\frac{1}{250}$ unit. In table 2 under group 3 are the results of the antitoxin determination in the Schick-negative children.

Group 4. In this group there were 119 children, ranging in age from 5 to 7 years. This group had been given one dose of alum precipitated toxoid in 1934. Blood was drawn and Schick tests were done in 1936.

Of these 119 children, six showed positive Schick tests and 113 were negative. Of those who showed positive Schick tests, three had between $\frac{1}{500}$ and $\frac{1}{250}$ unit of antitoxin per cubic centimeter of blood, two had less than $\frac{1}{500}$ and one had between $\frac{1}{25}$ and $\frac{1}{10}$. The antitoxin determinations and percentages of those who showed negative Schick reactions are seen under group 4 in table 2.

received two doses of plain toxoid one week apart in 1931 and 1932. Of these children 702, or 87.1 per cent, showed negative Schick test reactions and 127, or 12.9 per cent, positive.

In group 3, Schick tests were done in 1936 and 1937 on 634 children ranging in age from 7 to 9 years. These children received two doses of 0.2 per cent alum toxoid, not precipitated, one week apart in 1932 to 1934. Of these 514, or 81.1 per cent, showed negative Schick test reactions and 120, or 18.9 per cent, positive.

In group 4, a total of 660 children ranging in age from 1 to 4 years, were given one dose of alum precipitated toxoid in 1934. Of this group, in which Schick tests were done in 1936 and 1937, 612, or 92.7 per cent, showed negative results, and forty-eight, or 7.3 per cent, positive results.

In group 5, 1,000 children, or 100 per cent, of those tested, during 1938, ranging in age from 1 to 11 years, but for the most part from 1 to 2 years of age, responded negatively to the Schick test. This group was given plain toxoid, three doses a month apart, during 1936 and 1937.

COMMENT

Immunity to diphtheria may occur in various ways. It may be inherited, it may be acquired as a result of inoculation of some type of antigenic material or it may develop as a result of the inhalation of minimal

doses of diphtheria organisms. There is the possibility of "maturation immunity" or insusceptibility to disease due to maturity, independent of minimal inoculations.

In most children who are immune to the disease such immunity has probably developed as a result of all these factors. The inherited immunity is probably almost completely lost, in practically all cases, by the time the child has reached 1 year of age. Immunity that develops as the result of the inoculation of antigenic material lasts for a varying period of time, depending on the type of material inoculated and on the interval between doses. The longer the period after inoculation, the less should be the antitoxin content of the blood if these children are not exposed from time to time to diphtheria organisms, so that further immunity may develop as a result of the natural body processes.

In a consideration of the results which we have obtained in our experimental work, these various factors must be borne in mind. A greater interval elapsed between the time of inoculation and the time of testing in the children in group 1 than in the other groups. Hence from this standpoint it is to be expected that they would show lesser amounts of antitoxin. However, there was a greater opportunity for natural immunity to develop. Therefore an exact comparison is not possible between the children in the various groups. Nevertheless the figures seem to indicate that, both from the standpoint of the amount of antitoxin in the blood and from the standpoint of the Schick test, those children who received three doses of toxoid a month apart were better protected against diphtheria than those who received other types of inoculations. Just how long this immunity will continue cannot be stated at the present time. It is our intention to carry out further tests of the antitoxin content of the blood, from year to year, on the same group to determine the answer to this question.

Evaluation of the methods used to immunize the children in the five groups cannot be given with exactness till more time has passed and the relapse rate in group 5 can be determined. The observation may be made, however, that the time interval between immunization and the Schick test decreased by the integral variant of 1, while the percentage of relapses decreased by roughly 6 per cent a year from group 2 to group 5, giving an expected relapse rate in group 5 of zero, which it actually was. This does not make the results of a relapse rate of zero seem as good an omen of future high Schick negatives as may be expected from first examining the results. In fact, group 1, with a time lapse between immunization and Schick testing of six years and a relapse rate of only 2.4 per cent, has the statistical advantage over all other groups provided the important effect of environmental stimuli can be discounted.

Jensen³ has experimentally shown that the rate at which antitoxin disappears from the blood is a function of a rectangular hyperbola: $V = \frac{1}{X}$ or

$$T = \frac{A-X}{AX} \cdot \frac{1}{K}$$

A is maximum concentration of antitoxin following an antigenic stimulus, X is the amount of antitoxin which remains, T units of time after the moment at which A is reached, K is a constant which is different for each individual. This is the same formula by which lysins and other antibodies disappear from the blood.

One can see by the formula that when the amount of antitoxin is small the rate of decrease is small; i. e., if a patient has 1 unit of antitoxin per cubic centimeter of blood, his rate of loss of antitoxin is 10,000 times greater than when the antitoxin reaches 0.01 unit per cubic centimeter. If X or the antitoxin level is small and K is small, very long periods of time may elapse before an appreciable loss of antitoxin has been effected.

The toxin-antitoxin courses took place, however, at a time when the exposure to endemic diphtheria was much greater than could be experienced by the other groups; hence, so many of this first group encountered adequate secondary stimuli that the frequency of the Schick positive reactions decreased.

The main value of repeated doses of an antigen is that, should the antitoxin titer fail to rise within two or three days after the first inoculation it will not rise until the advent of a secondary stimulus.

The reasons given for failure to maintain the low rates of mortality and morbidity—that inoculated children are not rendered immune or that this immunity is lost with the passage of varying intervals of time—are ruled out by figures given in tables which show that

TABLE 3.—Diphtheria Antitoxin Content of Blood in Inoculated Children

Units of Diphtheria Antitoxin per Cc. of Blood Serum	Positive Reaction to Schick Test by Groups				
	Number of Children Reacting in				
	Group 1	Group 2	Group 3	Group 4	Group 5
1: 10 or more.....	..	..	..	..	..
1: 25 to 1: 10.....	..	..	..	1	..
1: 50 to 1: 25.....	..	..	..	..	..
1:100 to 1: 50.....	..	1	..	..	..
1:250 to 1:100.....	..	2	..	..	..
1:500 to 1:250.....	1	4	9	3	..
Less than 1:500.....	1	12	7	2	..
Total.....	2	19	16	6	0

the inoculated children are immune and that the immunity does last for a long period of time. Some other reason for this increase must be looked for.

The idea, backed by experimental proof, has been repeatedly put forward that the number of carriers of virulent diphtheria organisms is increased in proportion to the number of Schick negative persons in a community, and when a Schick positive is replaced by a Schick negative a potential avirulent carrier is replaced by a potential virulent carrier. Thus with a declining avirulent carrier rate goes a corresponding increase in the virulent carrier rate.

"Incomplete artificial immunization of a group may have no inhibitory effect on the total incidence of diphtheria and, for a short period, may increase the risk of attack in the unprotected section of the community."⁴ The increased number of virulent carriers (gravis), coupled with the fact that an increased rate of relapses occurred in groups 2, 3 and 4, supposedly due to failure of the action of natural environmental stimuli, account in part at least for the upswing of diphtheria morbidity and mortality rates.

In the past, the Schick test has been relied on almost exclusively as an index of the immunization status against diphtheria. The Schick test is subject to some criticism. Presumably the test is negative when there is more than $\frac{1}{250}$ unit of antitoxin per cubic centimeter of blood.

3. Jensen, Claus: Deutsche med. Wchnschr. 57: 324 (Feb. 20) 1931.

4. Dudley, S. F.; May, P. M., and O'Flynn, J. A.: Special Report Series, No. 195, Medical Research Council, London, 1934.

It is interesting to note that fifty-nine of the 471 children in the first four groups studied had a negative Schick test with an antitoxin content of blood less than $\frac{1}{250}$ of a unit per cubic centimeter.

It has been stated that a child should have at least $\frac{1}{25}$ unit of antitoxin per cubic centimeter of blood to be relatively well protected against diphtheria. Hence the unreliability of the Schick test as the measure against diphtheria is indicated.

We find that, in group 1, 74 per cent of the children who received toxin-antitoxin had more than $\frac{1}{25}$ unit. In group 2, 63.2 per cent of the children who had received two doses of plain toxoid had more than this quantity. In group 3, 62.8 per cent of those who had received two doses of plain alum toxoid a week apart had more than this amount. In group 4, 43.4 per cent of the children who had received one dose of alum precipitated toxoid had more than this amount, while, in group 5, 89.7 per cent of the children who had received three doses of plain toxoid had more than $\frac{1}{25}$ unit of antitoxin per cubic centimeter of blood serum.

TABLE 4.—*Procedures Employed by One Hundred and Four State and City Health Departments*

Doses Employed	Number of City and State Health Departments
Alum Precipitated Toxoid (The dose varies from 0.5 to 1 cc.)	
1..	58
2 (1 month apart)	9
2 (2 weeks apart)	3
2 (3 weeks apart)	2
2 (1 week apart)	1
2 (2 months apart)	1
2 (1 year apart)	1
Plain Toxoid (The dose varies from 0.5 to 1 cc., the usual dose being 1 cc.)	
2 (1 month apart)	10
2 (3 weeks apart)	9
2 (2 weeks apart)	5
3 (1 week apart)	3
3 (3 weeks apart)	5
3 (2 weeks apart)	3
3 (1 month apart)	3
Toxin Antitoxin (Employed in three doses a week apart in five city or state health departments)	

Of the methods of inoculation that have been employed in these five groups of children, it seems, from our figures, that without question the use of three doses of plain toxoid a month apart is the most efficient.

Further studies, however, will be necessary in order to determine the duration of such immunity as is acquired.

At present, according to the replies to a questionnaire which we sent to the health officers of many states and cities, there is great variation in the procedures employed in an attempt to produce immunity against diphtheria. Replies were received from 104 state and city health departments: thirty-six state and sixty-eight city. These replies indicated that thirty-seven cities employed alum precipitated toxoid almost exclusively, twenty-two employed plain toxoid almost exclusively, and seven employed both preparations, while two used both alum precipitated toxoid and toxin-antitoxin. The alum precipitated toxoid, according to these replies, is used more often than any type of antigen, the one dose method being employed by fifty-eight city and state health departments. The dose varied from 0.5 to 1 cc.

Table 4 indicates the number of health departments using alum precipitated toxoid, plain toxoid and toxin-antitoxin.

CONCLUSION

The evidence seems to indicate that more immunity to diphtheria is obtained when the antigen is given in a greater number of doses and the interval between inoculations is longer. Three doses of plain toxoid at monthly intervals seem to give the best result.

The Schick test cannot be relied on as a definite measure of the immunization status. The type of inoculations being used throughout the United States at present for the most part cannot be relied on to produce permanent immunity. With the adoption of three inoculations of toxoid at monthly intervals, it is to be hoped that diphtheria mortality and morbidity rates will show an even greater reduction in the future than they have in the past.

ADDENDUM

In March and April 1939, since the completion of this paper, seventy children in group 5 were retested to determine the antitoxic content of the blood and their reactions to the Schick test.

All the children were Schick negative. Thirty-eight, or 55.8 per cent, had more than $\frac{1}{10}$ unit of antitoxin per cubic centimeter of blood; seventeen, or 25.0 per cent, from $\frac{1}{25}$ to $\frac{1}{10}$; nine, or 13.2 per cent, from $\frac{1}{50}$ to $\frac{1}{25}$; three, or 4.4 per cent, from $\frac{1}{100}$ to $\frac{1}{50}$, and one, or 1.4 per cent, from $\frac{1}{250}$ to $\frac{1}{100}$. These figures represent a loss of 18.0 per cent in the group having more than $\frac{1}{10}$ unit, a gain of 9.1 per cent in those having from $\frac{1}{25}$ to $\frac{1}{10}$, a gain of 5.7 per cent in those having from $\frac{1}{50}$ to $\frac{1}{25}$, and of 3.5 per cent in those having from $\frac{1}{100}$ to $\frac{1}{50}$, with a loss of 0.4 per cent in those having from $\frac{1}{250}$ to $\frac{1}{100}$ unit.

These tests were carried out approximately two to two and one-half years following the administration of three doses of toxoid at intervals of one month.

Of the children who received three doses of plain toxoid at intervals of a month, 80.8 per cent have maintained, for a period of from two to two and one-half years, an antitoxic content above $\frac{1}{25}$ unit, which is the amount stated to be necessary for relatively good immunity against diphtheria. Thus in group 5 about 9 per cent of the children in a period of a year shifted from more than $\frac{1}{25}$ unit to less than this amount. At present none of this group have less than $\frac{1}{250}$ unit of antitoxin, which is the amount stated to be necessary to give a negative Schick test. These figures would indicate that with three doses of plain toxoid, given a month apart, immunity is relatively well maintained for a period of at least two to two and one-half years.

The children in this group probably have not had as great a possibility of coming in contact with diphtheria as those in the other groups. It seems evident, however, that this group of children must be retested yearly for the next several years before it will be possible to state definitely the rate at which immunity, as determined by the antitoxic content of the blood, is lost from year to year.

It is of interest to note that ten children of group 5 were retested in 1939 for their antitoxic content in addition to the seventy referred to. These ten, however, were Schick tested about three weeks prior to the drawing of blood for the antitoxin determination. Eight of these ten had more than $\frac{1}{10}$ unit in 1937; one had $\frac{1}{50}$ and the other $\frac{1}{25}$ unit. In 1939, after the Schick

test, eight showed more antitoxin than they had in 1937, one had the same amount, and one showed a slightly lesser amount.

Thus it seems from these figures that the stimulation of a Schick test in itself probably may be sufficient to increase the antitoxin content of the blood at least temporarily.

In view of the fact that there seems to be a gradual loss in the antitoxic content of the blood, consideration should be given to the advisability of reinoculating children with one dose of some antigen at intervals of from three to five years to maintain a sufficiently high level of antitoxin to ward off the disease.

GALLBLADDER DISEASE IN PATIENTS UNDER THIRTY YEARS OF AGE

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While disease of the gallbladder occurs at any age, even in fetuses and newly born infants,¹ it is considered primarily a disease of middle age and later life.² Approximately 16.5³ to 21⁴ per cent of patients operated on for symptoms due to disease of the gallbladder are under 30. In an effort to determine the course of the disease before 30 and the end results following cholecystectomy, an analysis was made of sixty-three cases of operation performed during the first three decades of life. These cases represented 21 per cent of 300 consecutive cases in which I had performed the operation.

There were fifty-eight females and five males. The distribution by decades and by sex is shown in table 1.

The ratio of females to males was 12 to 1. This figure is much higher than the ratio for all ages, for which reported values have varied between 2.05 to 1⁵ and 5.5 to 1.⁵ In the group of 300 cases from which these sixty-three were selected, the ratio was 5.2 to 1. On the other hand, in a study limited to 432 children under 15 years of age⁶ the ratio, while still in favor of females, was less than 2 to 1.

The general belief that a patient with disease of the gallbladder is usually overweight is not always borne out by the facts. Doran and his associates,⁷ for example, reported that 53 per cent of their patients were overweight; Smithies,⁸ on the other hand, reported but 8 per cent obese or consistently gaining weight. In the series of patients under consideration, twelve (19 per cent) were definitely overweight, forty-seven (74.6 per cent) were of average weight and four (6.3 per cent) were noticeably thin.

Since symptoms referable to the gallbladder occur frequently in relation to childbirth, it was not surprising that of the forty-eight married women in the series twenty-three (47.7 per cent) had symptoms either dur-

ing pregnancy or shortly thereafter. In two cases the symptoms were so severe and persistent that operation was done during pregnancy; the pregnancy continued uneventfully. The remaining twenty-one patients deferred operation for at least two years, but all were operated on within five years of the onset of symptoms.

Acute infectious diseases, particularly typhoid fever and scarlet fever, have been frequently cited as etiologic factors in disease of the gallbladder. In this group thirty-five (55.5 per cent) gave a history of one or more infectious diseases. Twenty-eight patients had had measles, eight scarlet fever and four typhoid fever. Of the twenty-three patients with symptoms during pregnancy, only nine (39.1 per cent) gave a history of acute infection. This would imply that the likelihood of disease of the gallbladder in pregnant women is not increased by a previous infectious disease.

The symptoms were similar to those presented by older patients, such as pain in the area of the gallbladder at times radiating to the back and sometimes to the shoulders, and belching, nausea and vomiting. While pain was always the prominent symptom, in fifty cases (79.3 per cent) it was severe enough to be described as colic. In fourteen cases (22.2 per cent) it frequently occurred after eating. Only fifteen patients (23.8 per cent) complained of eructations, although belching was reported⁹ as "prominent and distressing" in as many as 68.9 per cent of a group of patients of all ages. Nausea and vomiting affected twenty-nine (46 per cent), occurring almost as frequently in older patients.

The symptoms varied in duration from twenty-four hours, when the patient was operated on after the first attack of colic, to twelve years in a patient of 29.

TABLE 1.—Sex and Age by Decades

Age (years)	Males	Females	Total
To 9.....	1	0	1
10 to 19.....	0	4	4
20 to 29.....	4	54	58
Totals	5	58	63

TABLE 2.—Duration of Symptoms

Years	Patients
Less than 1.....	19
1 to 2.....	18
2 to 3.....	16
4.....	5
5.....	3
More than 5.....	2

Table 2 shows the duration of symptoms for these sixty-three patients. The average duration for the entire group was 2.1 years and the average age was 24.7 years.

While only five patients (7.9 per cent) were operated on before the age of 20 (table 1) four additional patients, making a total of nine (14.2 per cent), had symptoms beginning in their teens. Potter⁶ collected from the literature 432 cases under the age of 15 years, and Starr⁸ noted that 36 per cent of his patients had symptoms before the age of 25.

But five patients (7.9 per cent) showed evidence of clinical jaundice, and three of these (60 per cent) had no stones in the gallbladder. Blalock⁹ pointed out that

8. Starr, F. N. G., cited by Potter.¹²

9. Blalock, Alfred: A Clinical Study of Biliary Tract Disease, J. A. M. A. 83: 2057 (Dec. 27) 1924.

1. Shawan, H. K., and Long, E. C.: Gallbladder Disease in Young Children, Am. J. Surg. 21: 43 (July) 1933. Hamilton, H. B.; Rich, C. O., and Bisgard, J. D.: Cholecystitis and Cholelithiasis of Childhood, J. A. M. A. 103: 829 (Sept. 15) 1934.

2. Niemeier, O. W.: The Importance of Earlier Operation in Chronic Gallbladder Disease, Canad. M. A. J. 37: 332 (Oct.) 1937. Smithies,⁸ Blalock.⁹

3. Smithies, Frank: Clinical Manifestations in Gallbladder Disease: A Study of 1,000 Operatively Demonstrated Cases, Northwest Med. 19: 31 (Feb.) 1920.

4. Deaver, J. B., and Bortz, E. L.: Gallbladder Disease, J. A. M. A. 88: 619 (Feb. 26) 1927.

5. Wilson, W. D.; Lehman, E. P., and Goodwin, W. H.: Prognosis in Gallbladder Surgery, J. A. M. A. 106: 2209 (June 27) 1936.

6. Potter, A. H.: Biliary Disease in Young Subjects, Surg., Gynec. & Obst. 66: 605 (March) 1938.

7. Doran, W. T.; Lewis, K. M.; Deneen, L. V., and Hanssen, E. C.: Gallbladder Surgery: A Report of 200 Consecutive Operated Cases of Gallbladder Disease, Ann. Surg. 98: 321 (Sept.) 1933.

jaundice was almost as common in patients of all ages with noncalculous cholecystitis as in patients with cholelithiasis.

Of the sixty-three gallbladders that were removed, four (6.3 per cent) were acutely inflamed and fifty-nine (93.6 per cent) showed chronic cholecystitis, including one with cholesterosis. Thirty-eight gallbladders with chronic inflammation (64 per cent) contained stones, and stones were also present in all but one of the acutely inflamed gallbladders. In other words, a total of forty-one gallbladders (65 per cent) had stones. One patient, a boy of 7 years, showed noncalculous acute cholecystitis.

Besides this 7 year old boy there were twenty-one patients with noncalculous cholecystitis; sixteen of these (76.1 per cent) had colicky pain. Other investigators¹⁰ have reported that approximately 55 per cent of their patients with noncalculous chronic cholecystitis gave a history of colic.

Eight common ducts (12.6 per cent) were opened and, together with the hepatic ducts, explored. Only three common ducts (37.5 per cent) contained stones. The patients with choledocholithiasis had no jaundice at any time. They were 24, 27 and 29 years old. The shortest duration of the disease was four years, in the 24 year old patient. Symptoms were present for five years in the 29 year old patient and for seven years in the 27 year old patient.

The incidence of stones in the common duct in the entire series was 4.7 per cent, but for the forty-one cases of calculous gallbladder the incidence was 7.3 per cent. It has been reported that in only 4 per cent of cases of noncalculous gallbladder are stones found in

Only four patients had any postoperative complications. One patient had phlebitis, which kept her in the hospital thirty-four days; she had a similar complication following childbirth three years previous to operation. One patient had a superficial infection of the operative wound, which cleared up in several days. Another patient, aged 29 years, whose common duct was opened and explored and the sphincter of Oddi dilated, had a gas bacillus infection. The infection was not severe and she was discharged from the hospital as "well" on the twenty-first postoperative day.

It was possible to follow fifty-seven patients (90.4 per cent) after operation. Twenty-four patients were followed from one to four years, fifteen were seen from five to eight years after cholecystectomy and eighteen were followed from eight to ten years or more. The longest period of observation was thirteen years.

Fifty-three patients (92.9 per cent) were free from symptoms when last seen. Thirty-six (97.2 per cent) of the thirty-seven who had gallstones were entirely relieved; seventeen (85 per cent) of the twenty who had noncalculous chronic cholecystitis were either greatly improved or completely relieved. These satisfactory end results were much better than those reported for patients of unclassified age groups (table 3). In the reports for cholelithiasis the improvement varied from almost 3 to 18 per cent, while for noncalculous cholecystitis the improvement ranged from 14 to 21 per cent.

Four patients (7 per cent) had attacks of gallbladder colic following cholecystectomy. One of these patients had cholelithiasis and three had noncalculous cholecystitis. The pain was severe enough in two cases to warrant repeated hypodermic injections of morphine by the family physician. At no time did any of these patients have jaundice, chills or fever. X-ray examination showed no abnormality. Whether these postoperative attacks of colic were due to overlooked stones in the common duct, to biliary dyskinesia or to some extrabiliary abnormality is problematic.

One patient who was considered cured was free from symptoms for two years after removal of a noncalculous gallbladder. Then the attacks recurred and persisted for three years. Because nonsurgical treatment gave no relief, another operation was done; only adhesions were found. Since then she has been free from all symptoms.

In any group of patients with a noncalculous gallbladder the question may be raised whether operation is justified, in view of the large percentage that are unrelieved. Blackford and his associates¹³ followed 200 patients of all ages with noncalculous chronic cholecystitis for from five to fifteen years. They reported that but 37 per cent had satisfactory relief without operation for more than eight years; 48 per cent who had nonsurgical treatment for the same period either were operated on later or should have been, because of persistence of symptoms.

SUMMARY

Sixty-three patients operated on for disease of the gallbladder before the age of 30 represented 21 per cent of 300 consecutive cholecystectomies.

Operation before the age of 30 does not mean that the disease is necessarily of short duration; five patients

TABLE 3.—Comparison of End Results

Author	Cured or Improved	
	With Stones, %	Without Stones, %
Present study (patients under 30).....	97.2	85.0
Wilson, Lehman and Goodwin ¹	79.0	64.0
Kunath (J. A. M. A. 109:183 [July 17] 1937).....	84.3	69.0
Graham, E. A., and Mackey, W. A. (J. A. M. A. 103:1497 [Nov. 17] 1934).....	....	65.2
Brown, M. J. (Am. J. Surg. 41:238 [Aug.] 1938).....	....	70.8

the common duct.¹¹ In the twenty-one instances of noncalculous gallbladder in this series no stones were present in the biliary ducts.

Stones are not rare in the common and in the hepatic duct of patients under 30. Of 221 patients with stones in the biliary ducts, fifteen (7.4 per cent) were under 30.¹¹ Moreover, of 226 patients under 15 with disease of the gallbladder, thirteen (5.7 per cent) had stones in the biliary ducts, including an 8 month fetus and two infants of 12 and of 25 days.¹² On the other hand, the incidence of stones in the common and in the hepatic duct of patients of all ages has been reported as high as 21.2 per cent.¹¹

One patient in this group had acute hemorrhagic pancreatitis associated with cholelithiasis. She was an obese woman 29 years old who had had symptoms for three years before operation.

There were no deaths in this series.

10. Kunath, C. A.: The Stoneless Gallbladder, J. A. M. A. 109:183 (July 17) 1937. Smithies.²

11. Lahey, F. H., and Swinton, Neil: Stones in the Common and Hepatic Bile Ducts, New England J. Med. 213:1275 (Dec. 26) 1935.

12. Potter, A. H.: Gallbladder Disease in Young Subjects, Surg., Gynec. & Obst. 46:795 (June) 1928.

13. Blackford, J. H.; King, R. L., and Sherwood, K. K.: Cholecystitis: Study Based on Follow-Up After from Five to Fifteen Years of 279 Patients Not Operated On, J. A. M. A. 101:910 (Sept. 16) 1933.

(7.9 per cent) had symptoms for five or more years and one had symptoms for twelve years.

Only four patients (6.3 per cent) had acute cholecystitis and fifty-nine patients (93.6 per cent) had chronic cholecystitis. Gallstones were present in forty-one cases (65 per cent); this included three of acute cholecystitis.

Three patients had stones in the common duct, an incidence of 4.7 per cent, but when the incidence was based on the forty-one cases of calculous gallbladder it was 7.3 per cent. The duration of the symptoms in these cases varied from four to seven years.

Fifty-seven patients (90.4 per cent) were followed after operation; fifty-three (92.9 per cent) were free from symptoms when last seen. Thirty-six patients (97.2 per cent) of thirty-seven with cholelithiasis were entirely relieved; seventeen of twenty with noncalculous chronic cholecystitis (85 per cent) were either greatly improved or completely relieved.

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TREATMENT OF VULVOVAGINITIS WITH ESTROGEN

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Infections of the immature vagina present a social and medical problem of considerable magnitude, especially in hospitals and asylums for children. Despite the available diagnostic procedures, it is often most difficult to differentiate the transmissible (gonococcal) from the nonspecific form of vulvovaginitis. It therefore becomes imperative to isolate at considerable cost and inconvenience every institutional case of vulvovaginitis. The occurrence of gonococcal vulvovaginitis in the home of a family presents no less a problem in preventing the spread of the infection to young sisters and schoolmates. In many instances the condition remains unrecognized until two or more members of a family are affected.

Although serious complications such as arthritis, salpingitis and ophthalmia are relatively infrequent, unless the gonococcus assumes an unusual virulence in passing through one or more susceptible hosts even the mild form of the infection leaves its imprint on the psyche of the affected child. The persistence of vulvar irritation for many months or years centers the attention of the growing child on the generative organs and often leads to the habit of masturbation and premature heterosexual inclinations.

The incidence of gonococcal vulvovaginitis varies with the facilities of the community to detect and isolate infected children lacking proper supervision. Taussig¹ found that 5 per cent of the girls attending the dispensary of the St. Louis Children's Hospital had gonococcal vaginitis and that in most instances the parents or guardians were unaware of its existence. Compulsory reporting of cases to health authorities, education of parents in prophylaxis and better nursing facilities in hospitals have tended in recent years to decrease the incidence of the infection in most communities.

ETIOLOGY OF VULVOVAGINITIS

Although the poor resistance of the ill child, as seen in the exanthems and in severe infections of the upper respiratory tract, plays an important role in the predisposition to vulvovaginitis, the most important predisposing factor is undoubtedly the low resistance of the immature vagina to any pathogenic bacteria, especially the gonococcus, which thrives in the alkaline medium occasioned by the glycogen-poor vaginal epithelium of the child.

The immature vagina, though not a sterile cavity, is zealously guarded against gross contamination and traumatism by the hymen until sexual maturity. Often the inexperienced nurse or intern, in making the routine vaginal smear preliminary to admission to the hospital, inadvertently brings the cotton swab into contact with the unclean external parts before the vagina is entered. This contamination plus the unavoidable friction-traumatism to the delicate vaginal epithelium frequently results in a nonspecific vaginitis, rendering the vagina more susceptible to invasion by the gonococcus. Such errors may be obviated, as suggested elsewhere by one of us,² by examining the centrifuged vaginal washings obtained through a small, soft rubber catheter after the vulva is thoroughly cleansed.

In institutional epidemics of gonococcal vulvovaginitis the disease is most often transferred through the medium of diapers, bed linens, rectal thermometers or the hands of careless nurses. The nursing technic in a pediatric ward should be based always on the assumption that one of the patients has an unrecognized gonococcal vulvovaginitis. In most instances of vulvovaginitis occurring in the home of the patient, the source of infection may be traced to an infected member of the family or to a contaminated lavatory seat at home or in school. According to Taussig,¹ this is the most frequent mode of transmission of the disease because of the characteristic manner in which children slide from high toilet seats.

DIAGNOSIS OF VULVOVAGINITIS

The clinical picture of vulvovaginitis is unmistakable. To differentiate the transmissible (gonococcal) from other types of vulvovaginitis requires careful bacteriologic study by smear and culture. The demonstration of intracellular diplococci, morphology of gonococci, is fairly reliable.

Unfortunately the smear method has its limitations and, when negative or doubtful, the more refined culture method is essential to a differential diagnosis. The relative merits of the two diagnostic procedures in children presenting definite clinical symptoms of gonococcal vulvovaginitis were evaluated by Ruys³ as follows: "Smears positive, culture positive in 111; smears negative, culture positive in fourteen; smears positive or doubtful, culture negative in seven." The superiority of the culture method was thus amply demonstrated. Since *Micrococcus catarrhalis*, frequently present in the vagina of children, morphologically resembles the gonococcus, the culture method is especially valuable in instances of positive smears without clinical symptoms. One must nevertheless remember that even the culture method is not infallible, since an overgrowth of secondary invaders may obscure the picture. Negative cultures under these conditions do

From the Philadelphia Institute for Medical Research in the Philadelphia General Hospital.

1. Taussig, F. J.: *Diseases of the Vulva*, New York, D. Appleton & Co., 1931.

2. Mazer, Charles, and Rubin, S.: *Vulvovaginitis in Children*, *Am. Physician* 31: 653 (Dec.) 1926.

3. Ruys, A. Charlotte: *The Etiology of Vulvovaginitis Infantum*, *J. A. M. A.* 105: 862 (Sept. 14) 1935.

not preclude the possible presence of gonococci. The gonococcus complement fixation test, even with the improved technic employed by Mascall,⁴ is positive in only 58.6 per cent of cases of gonococcic vulvovaginitis. It is therefore safer to consider every case of vulvovaginitis as gonococcic when discovered in a pediatric ward or an asylum for children.

PATHOLOGY OF GONOCOCCIC VULVOVAGINITIS

In the acute stage the vulva is reddened and edematous. When viewed through an endoscope the vaginal mucosa appears congested and the site of small erosions. The portio vaginalis in the vicinity of the pinhead sized external cervical os presents the same pathologic picture, giving the erroneous visual and bacteriologic impression of an associated endocervicitis. We agree with Schauffler and Kuhn⁵ that the endocervix of the child is practically never invaded by the gonococcus because of the rudimentary state of its racemose glands. This also explains the singularly low incidence of salpingitis in children affected with gonococcic vaginitis. None of the 118 patients in this series showed clinical evidence of salpingitis, nor did one of us (Mazer) observe a single instance of this complication during the severest institutional epidemic of gonococcic vaginitis and arthritis in medical history, which occurred in one of the Philadelphia maternity hospitals in 1924.⁶

Bartholinitis is extremely rare. It was not encountered in any of our 118 patients. The urethral meatus is often red and pouting, but Skene's glands are rarely infected. However, the presence of pus cells in the urine voided following cleansing of the vulva points to an anterior urethritis, which was encountered by Miller⁷ in six of sixty-eight cases of gonococcic vulvovaginitis. Only one of the 118 cases herein reported presented a definite urethritis.

Proctitis is apparently a frequent complication and may be a source of vaginal reinfection when untreated. The smear method is evidently inadequate to demonstrate involvement of the rectum. By means of a special culture medium, Ruys⁸ recovered gonococci from the rectum in every child afflicted with specific vulvovaginitis. Clinical evidence of an associated proctitis is, however, rarely seen except during an institutional epidemic of the disease, when, as shown by Cooperman,⁶ even the male infants show symptoms of proctitis.

Arthritis is rarely encountered except during epidemics, when the gonococcus assumes an unusual virulence in passing through many nonresistant hosts. Illustrative of this was the high incidence of gonococcic arthritis encountered during the Philadelphia epidemic, in which twenty-seven males and forty females were equally affected with gonococcic arthritis.⁶

BASIS OF TREATMENT OF VULVOVAGINITIS WITH ESTROGEN

Owing to the presence of maternal estrogen, the vaginal epithelium of the newborn is of considerable thickness (from thirty to forty layers of cells). The numerous basal layers are compact and irregular, form-

ing papillae which penetrate deeply the tunica propria. Superimposed on the basal epithelium are many layers of spindle-shaped, glycogen-containing cells. The vaginal secretion is acid and the bacterial flora predominantly of the bacillary type.⁹ Thus the safeguards present at birth are similar to those current in the mature vagina, which is so highly resistant to infections other than *Trichomonas vaginalis*. Within three or four weeks after birth, when the influence of maternal estrogen subsides, the numerous layers of glycogen-containing epithelial cells are thrown off and the basal zone becomes thin and regular in outline—evidence of inactivity. There is a paucity in cell glycogen and of Döderlein's bacilli, resulting in alkalinity of the vaginal secretions.¹⁰ The vagina remains in this vulnerable state throughout childhood until the advent of puberty, when the estrogen elaborated by the maturing ovaries causes a return of the vaginal mucosa to a neonatal-like state, varying only slightly in structure during the cyclic changes in production of estrogen by the active ovaries. With the advent of senility, the vaginal epithelium once again reverts to that resembling immaturity, becoming even more vulnerable to infection and traumatism than the childhood vaginal epithelium. The superficial layers disappear, leaving only about six layers of small nucleated cells with a granular cytoplasm.¹¹

Knowledge of these facts led Lewis¹² to employ injections of estrogenic substances in the treatment of gonococcic vulvovaginitis in the hope of transforming the vulnerable childhood vagina to the resistant adult types. The new treatment suggested by Lewis evoked considerable discussion in the medical literature, some favorable and some entirely unfavorable.

In employing a new product in the treatment of human ailments, its safety must be established first. The most valid objection to the use of estrogen in children is the possibility of permanent damage to the ovaries. This objection, based on the experimental observation¹³ that prolonged treatment with estrogen produces regressive ovarian changes, is difficult to substantiate in human beings. Very few of the children treated with estrogen for gonococcic vaginitis have to date attained puberty. None have attained the age of childbearing, to permit determination of the effect of the hormone on germ plasm.

In defense of the use of estrogen, the following evidence of its safety is available:

1. Rats and monkeys given considerable quantities of estrogen for a relatively long period ultimately become estrous, mate and reproduce normally.¹⁴
2. The blood of the unborn infant is normally surcharged with estrogen to a degree (at least 1 mouse unit per cubic centimeter) far greater than that of children treated with maximum doses of the substance.
3. The few treated children who have already attained puberty have menstruated at the predicted age.¹⁵

4. Mascall, W. N.: Pathological Diagnosis of Female Gonorrhea, *Lancet* 2: 233 (July 29) 1933.

5. Schauffler, G. C., and Kuhn, Clifford: Information Regarding Gonorrhea in the Immature Female, *Am. J. Obst. & Gynec.* 25: 374 (March) 1933.

6. Cooperman, M. B.: Gonococcus Arthritis in Infancy: A Clinical Study of Forty-Four Cases, *Am. J. Dis. Child.* 32: 932 (June) 1927.

7. Miller, J. R.: Two Years' Experience with Theelin Treatment of Gonorrheal Vaginitis, *Am. J. Obst. & Gynec.* 29: 553 (April) 1935.

8. Ruys, A. Charlotte, and Jens, P. A.: Kulturelle Untersuchung des Rektalschleimes bei Kindern mit Vulvovaginitis gonorrhoeica, *München. med. Wchnschr.* 50: 846 (June 2) 1933.

9. Cruickshank, Robert, and Sharman, Albert: Biology of Vagina in Human Subject; Glycogen in Vaginal Epithelium and Its Relation to Ovarian Activity, *J. Obst. & Gynaec. Brit. Emp.* 41: 190 (April) 1934.

10. Lewis, R. M., and Weinstein, Louis: The Production of Vaginal Acidity by Estrin, *Surg., Gynec. & Obst.* 63: 640 (Nov.) 1936.

11. Davis, M. E.: The Treatment of Senile Vaginitis with Ovarian Follicular Hormone, *Surg., Gynec. & Obst.* 61: 680 (Nov.) 1935.

12. Lewis, R. M.: Study of Effects of Theelin on Gonorrheal Vaginitis in Children, *Am. J. Obst. & Gynec.* 26: 593 (Oct.) 1933.

13. Allen, Edgar: Sex and Internal Secretions, Baltimore, Williams & Wilkins Company, 1932.

14. Allen, Edgar, and Diddle, A. W.: Ovarian Follicular Hormone Effects on Ovaries, *Am. J. Obst. & Gynec.* 29: 83 (Jan.) 1935.

15. Mazer, Charles, and Israel, S. L.: Studies on the Optimal Dose of Estrogens: An Experimental and Clinical Evaluation, *J. A. M. A.* 108: 163 (Jan. 16) 1937.

4. Regularly menstruating women who receive estrogen in doses of 10,000 rat units every fourth day for periods varying from two to four months menstruate normally after withdrawal of treatment and bear normal offspring.¹⁶ The more recent employment of vaginal suppositories, requiring, as it does, relatively small doses of estrogen, has partly solved the problem of possible harmful effects.

Next in importance to the safety of treatment of specific vaginitis with estrogen is its comparative effectiveness. Does it accomplish a cure sooner than other methods of treatment? Is the cure permanent or temporary? Opinions of competent clinicians concerning this phase of the problem differ so widely that, for the present, one must rely solely on personal experience. Dosage, length of treatment, mode of administration, attention to extragenital foci of infection not influenced by the substance and the ability to eliminate extraneous sources of reinfection undoubtedly account for the discordant reports. Dosage and route of administration are indissolubly linked, since even a small fraction of the hypodermic dose of estrogen produces the desired hypertrophy of the vaginal mucosa when introduced directly into the vagina.¹⁷ Employment of the small doses required for vaginal administration of the substance reduces the incidence of the undesirable, though temporary and harmless, effects, such as enlargement of the breasts and premature menstruation, often encountered with effective hypodermic doses. There are, nevertheless, definite objections to prolonged vaginal treatment of the child. In addition to requiring intelligent cooperation of the mother, who, despite her intelligence, may nevertheless inadvertently carry the infection to another member of the family, oft-repeated vaginal treatment of the child frequently creates the habit of masturbation and premature heterosexual inclinations.

The size of the dose is the determining factor in accomplishing a cure. The length of treatment determines the percentage of recurrences. The longer the period of treatment, the less the chance of recurrence. The dose must be sufficient to cornify the vaginal epithelium and to reduce the pH of the vaginal secretions to a point below 6. Our experience has shown that the minimum effective hypodermic dose is 500 rat units given every other day. Smaller doses, such as 100 rat units (approximately 800 international units), even when administered daily, produce only doubtful vaginal reactions and require treatment for as long as twenty-two weeks.¹⁸ The minimum dose by the vagina is 100 rat units nightly, inserted on retiring. With these doses, the necessary vaginal response (cornification, acidity and an absence of pus and gram-negative diplococci) is usually observed on the fourth week of treatment.

In considering the problem of dosage, it is pertinent to clarify the existing confusion which dual standardization of estrogenic products creates. Estrogenic substances vary widely in their ability to cornify the vaginal mucosa of the rat. The international unit (weight unit) of estrogen is 0.1 microgram. The rat unit (biologic unit) is the minimum quantity of estro-

genic substance capable of evoking estrus in the castrated rat. The ratio between the international unit and the rat unit varies with the chemical composition and the purity of the product. In our laboratory, various samples of estrone (theelin) yielded 1 million rat units per gram, estriol (theelol) 150,000 rat units per gram, estradiol (progynon-DH) as much as 10 million rat units per gram, and estradiol benzoate (progynon-B) $5\frac{1}{2}$ million rat units per gram. It is evident, therefore, that the use of the rat unit is preferable when dealing with the several estrogens.

Equal to the importance of dosage in accomplishing clinical and bacteriologic cure is the length of treatment in preventing recurrence of the infection. It will be seen later that the percentage of recurrences is larger when the period of treatment, despite early and repeated negative smears, is much less than eight weeks. We¹⁹ have previously stressed the importance of the length of treatment in preventing recurrences. Lewis¹⁸ is equally emphatic on this point. The truth of the dictum that too short a period of treatment and not reinfection is responsible for the majority of early recurrences is evident from a study of some of the available literature on hypodermic treatment of vulvovaginitis with estrogen. Regardless of dosage, which if inadequate could not have produced even a temporary cure, too short periods of treatment (from twenty-one to forty days) allowed recurrences in nine of twenty-two patients treated hypodermically by Te Linde,¹⁹ in seven of thirteen treated by Phillips,²⁰ in four of eleven treated by Brown²¹ and in eight of twenty-two children treated by Reichert.²² On the other hand, with longer treatment (from fifty to sixty days), Linper²³ observed no recurrences in twenty-four patients discharged as cured, and Lewis¹⁸ encountered none in twenty-two. Recurrences appearing soon after the vagina returns to its former immature state (four weeks after treatment) may be reasonably attributed to insufficient length of treatment and not to reinfection. Those appearing later than three months after withdrawal of treatment may be attributed to reinfection or to a persistent focus not within the influence of the substance.

EVALUATION OF TREATMENT WITH ESTROGEN IN 118 CASES OF GONORRHEAL VULVOVAGINITIS

The present study embraces a group of 118 children, ranging in age from 18 months to 11 years, admitted consecutively to the wards of the Philadelphia General Hospital from January 1935 to May 1937 for the treatment of gonococcic vulvovaginitis. The diagnosis in each case was based on clinical symptoms and on the presence of gram-negative, intracellular diplococci, structurally characteristic of the gonococcus in the vaginal smear. Since the children were hospitalized during the entire period of treatment, there was an excellent opportunity to observe the response to the administration of estrogen. About one third of the children were in the acute stage of the illness at the time of admission. The duration of the disease in the others ranged from two months to two years. There was

16. Mazer, Charles; Meranze, D. R., and Israel, S. L.: Evaluation of the Constitutional Effects of Large Doses of Estrogenic Principle, *J. A. M. A.* 105: 257 (July 27) 1935.

17. Berger, Milan: Besonders hohe Wirksamkeit des Follikelhormons bei vaginaler Instillation, *Klin. Wchnschr.* 14: 1601 (Nov. 9) 1935.

18. Lewis, R. M., and Adler, E. L.: Gonorrheal Vaginitis: Results of Treatment with Different Preparations and Amounts of Estrogenic Substance, *J. A. M. A.* 106: 2054 (June 13) 1936.

19. Te Linde, R. W., and Brawner, J. N., Jr.: Experiences with Amniotin in the Treatment of Gonococcal Vaginitis in Children, *Am. J. Obst. & Gynec.* 30: 512 (Oct.) 1935.

20. Phillips, R. B.: Theelin Therapy in Vulvovaginitis, *New England J. Med.* 213: 1026 (Nov. 21) 1935.

21. Brown, D. K.: Management of Vulvovaginitis in Children, *Brit. J. Ven. Dis.* 11: 207 (July) 1935.

22. Reichert, J. L.; Epstein, I. M.; Jung, Ruth, and Colwell, Charlotte A.: Infection of Lower Part of Genital Tract in Girls, *Am. J. Dis. Child.* 54: 459 (Sept.) 1937.

23. Linper, M. A., and Hieronymus, E. E.: Treatment of Gonorrheal Vaginitis in Childhood with Estrogenic Substances, *J. Pediat.* 9: 240 (Aug.) 1936.

no appreciable difference in the response of the respective groups to treatment with estrogen.

Eighty-one of the 118 children were treated by means of hypodermic injections of estradiol benzoate (progynon-B²⁴); thirty-four received the same product as vaginal suppositories, and the remaining three were given estradiol (progynon-DH) orally.

HYPODERMIC ADMINISTRATION OF ESTROGEN

Sixty-one of the eighty-one children hypodermically treated received from 1,000 to 1,500 rat units and seven were given 500 rat units every other day for eight weeks; the remaining thirteen received 500 rat units every other day for a period of from four to six weeks.

The first of four consecutive vaginal smears was obtained after two weeks of treatment in forty-six cases, in the fourth week of treatment in fourteen and during the fifth week in eighteen. The vaginal discharge was then scanty, thick and snow white, revealing a mass of non-nucleated epithelial cells and gram-negative bacilli on smears. In the remaining three the vaginal smears were persistently positive, possibly because of inadequate vaginal drainage of accumulated debris, which in itself may have been a source of irritation. In order to evaluate treatment with estrogen accurately, no attempt was made to dilate the introitus or to irrigate the vagina for the purpose of removing the plugs of desquamated epithelial cells.

Sixty-one of the seventy-eight children successfully treated with estrogen hypodermically were followed for a period of from three to twenty-three months, with an average of ten months for the entire group. There were only six (10 per cent) recurrences in the sixty-one followed-up patients who had received hypodermic treatment. Analyzing the sixty-one followed-up cases according to the length of treatment, we found four recurrences in the fifty-three who had received treatment for eight weeks and two in the eight who had received treatment for a period of only from four to six weeks. Notwithstanding the fact that the comparison is made on too few patients, it is nevertheless significant that the incidence of recurrences in the group of eight followed-up patients who had received the relatively short treatment was three times greater than in the group treated for the full period of eight weeks. Equally significant is the fact that recurrences with shorter treatment were not only more numerous but appeared much earlier (from four to six weeks after treatment), suggesting that incomplete cure was the cause of the trouble.

Side effects other than growth of pubic hair occur more frequently and are more intense with adequate hypodermic treatment than with vaginal suppositories. Twenty-one of the eighty-one children (26 per cent) showed enlargement of the breasts, which persisted for about a month after withdrawal of the treatment; seven (8.5 per cent) had a scanty growth of pubic hair, which eventually disappeared, and eight (10 per cent) had a single episode of uterine bleeding either during treatment or later.

TREATMENT WITH VAGINAL SUPPOSITORIES OF ESTROGEN

Thirty-four children were treated with vaginal suppositories, each containing 200 rat units of estradiol benzoate (progynon-B), inserted nightly on retiring for a period of eight weeks.

A clinical cure and four consecutive negative vaginal smears were obtained during the fourth week of treatment in thirty-three of the thirty-four children. The remaining patient failed to respond to vaginal as well as to subsequent hypodermic treatment with 1,500 rat units given every other day for a period of eight additional weeks.

The side effects with vaginal suppositories of estrogen were less pronounced than with hypodermic treatment. In eight of the thirty-four patients there was a moderate enlargement of the breasts; in six there was a semblance of pubic hair growth and in one a single episode of menstruation. This child was, moreover, 11 years old and might have menstruated irrespective of the treatment.

Twenty-six of the thirty-three children treated with vaginal suppositories and discharged as cured were followed for a period of from three to thirteen months, averaging seven months. There were no recurrences, essentially substantiating the observation of Te Linde²⁵ that the treatment of gonococcic vulvovaginitis with vaginal suppositories is practically free from recurrences. He²⁵ states that a check-up of his first 100 patients treated by vaginal suppository showed ninety-eight of them clinically well and with negative smears from three months to two and one-half years after the last treatment.

ORAL TREATMENT

In three patients, oral administration of 1,500 rat units daily of estradiol (progynon-DH) for a period of eight weeks failed to accomplish a cure. They were subsequently treated by other methods. These results with oral therapy are in accord with those obtained by Te Linde²⁶ in six patients treated with equally large doses for a period averaging 105 days. It seems that in the human being as well as in the experimental animal²⁶ the minimum effective oral dose of estrogen must be five times greater than the hypodermic dose.

SUMMARY

1. The basis of treatment of vulvovaginitis with estrogen is the ability of the substance to create a temporary maturity environment in the vagina of the child and thus render it resistant to pathogenic bacteria.
2. The dose of estrogen must be sufficient to cornify the vaginal epithelium and to reduce the p_H of the vaginal secretions to a point below 6.
3. Treatment for eight weeks, despite an earlier clinical and bacteriologic cure, is a safeguard against recurrence of the infection.
4. Hypodermic injections produced a clinical and bacteriologic cure in seventy-eight of eighty-one children, with a 10 per cent incidence of recurrence.
5. Treatment with vaginal suppositories of estrogen produced a clinical and bacteriologic cure in thirty-three of thirty-four children without any recurrence in the twenty-six who were observed for a relatively long time.
6. Oral treatment was ineffective in three children who received as much as 1,500 rat units daily for a period of eight weeks.
7. Side effects, such as growth of pubic hair, uterine bleeding and enlargement of the breasts, are temporary and are more frequently encountered with hypodermic than with local treatment with estrogen.

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24. Drs. Gregory Stragnell and Erwin Schwenk supplied the material employed in this work.

25. Te Linde, R. W.: The Treatment of Gonococcal Vaginitis with the Estrogenic Hormone, *J. A. M. A.* 110: 1633 (May 14) 1938.
26. Morrell, J. A.; Powers, H. H.; Varley, J. R., and DeFrates, J.: The Results of Oral Administration of Amniotin to Monkeys, *Endocrinology* 14: 174 (May-June) 1930.

LOCAL AND SYSTEMIC EFFECTS FROM
INHALATION OF STRONG SOLUTIONS OF EPINEPHRINEJ. V. GALGANI, M.D.
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Inhalation of vaporized 1 per cent solution of epinephrine is extensively used in the relief of bronchial asthma.¹ This is a convenient way of obtaining directly the well known bronchodilator action of epinephrine without the necessity of hypodermic injection. The clinical results have been generally good as to relief of asthmatic attacks. At least ten atomizers are advertised as specially designed for this purpose, and, in addition, 1 per cent solution of epinephrine is the active ingredient of a large number of trade-marked anti-asthma products offered to the public. In spite of the widespread use of this strong concentration of epinephrine, no reports have been made as to possible local irritative effects on the respiratory tract. When it is remembered that deep inhalations of this potent drug are practiced almost indefinitely in a chronic disease state, it would appear desirable to understand more fully and definitely, if possible, the mechanism of the antiasthmatic action and the possible side actions locally and systemically. Therefore, studies were initiated toward these ends and are reported in this paper.

SIZE OF DOSE

The vaporizers ordinarily used are specially designed to throw out very fine impalpable droplets, which are so small that they will not wet or fog a mirror. In order to determine how much of the solution was vaporized under conditions of ordinary use, three hand atomizers, or nebulizers, of the type prescribed for epinephrine inhalations were weighed on an analytic balance before and after use on ten different occasions. After squeezing the bulb forty times, which is more than is commonly done by patients, there was delivered an average of 0.034 Gm. of the 1 per cent solution, or 0.34 mg. of epinephrine from the mouth of the nebulizer, or about 0.008 mg. of epinephrine per compression. Only a small portion of this solution reaches the bronchi when the vapor is inhaled through the mouth. Spoto² working with dogs and Rubow³ with rabbits estimated the penetration of such nebulized fluids into the deep respiratory passages by using solutions of chemicals which could be quantitatively determined in the lung tissue. They found that not more than 3 per cent of inhaled vapor reached the lung, and generally the amounts were much less. According to these authors

the greater part of the solution was deposited on the pharynx, larynx and trachea.

Similar localization was confirmed for patients by the following observation:⁴ A surgical patient, with a bronchial fistula in the anterior wall of the chest communicating with the left main bronchus, was prepared for excision of the fistula. A 5 per cent aqueous solution of gentian violet was continuously vaporized into the patient's mouth for several minutes while he inhaled deeply and exhaled through the fistula. A small catheter in the fistula conducted the expired air through a test tube of water, but this remained uncolored. The operation then proceeded, with excision of the fistulous tract. Examination of it immediately after removal failed to reveal the slightest trace of staining of the tissue by the gentian violet, although a blue color was present in

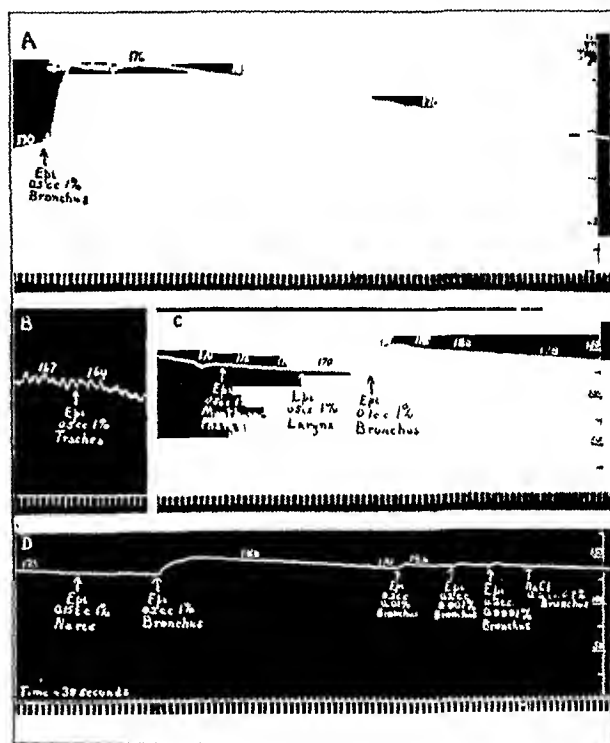


Fig. 1.—Effects on the blood pressure of a cat from different volumes and strengths of solution of epinephrine applied to isolated segments of the respiratory tract (pentobarbital anesthesia).

the mouth and posterior portion of the pharynx. Obviously not enough gentian violet reached the bronchus to impart a color to the water or to stain the walls of the fistula. From the fact that the tinctorial capacity of aqueous solutions of gentian violet is very great, a definite color being present in dilutions as low as 1:10,000,000, the total amount of the dye in the air expired must have been negligible. The mechanisms for removing particulate matter from the inspired air must be extremely efficient, as practically all the droplets were removed from the air before it reached the smaller bronchi. This agrees with Spoto's and Rubow's observations that the greater part of a vaporized solution remains in the upper part of the respiratory passages. In view of this result, it was of interest to determine whether the epinephrine was absorbed from the upper part of the respiratory tract and exerted any systemic effects.

4. Matzger, Edward: Personal communication to the authors.

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From the Departments of Pharmacology and of Pathology, Stanford University School of Medicine, San Francisco, and the Santa Clara County Hospital.

1. Matzger, Edward. *California & West. Med.* 43: 226 (Sept.) 1935. Graesser, J. B., and Rowe, A. H. *J. Allergy* 6: 415 (July) 1935; *J. Lab & Clin Med.* 21: 1134 (Aug.) 1936; Inhalation of Epinephrine Hydrochloride for Relief of Asthma in Children, *Am. J. Dis. Child.* 52: 92 (July) 1936. Larsen, K. H., and Nielsen, N. A.: *Acta med Scandinav.* 51: 197, 1937.

2. Spoto, P. *Arch. internat. de pharmacodyn. et de therapie* 39: 263, 1930, 42: 87, 1932.

3. Rubow, V. *Hospitalstud.* 68: 169 (Feb. 26) 1925.

CIRCULATORY EFFECTS

To this end the pressor and cardiac effects of inhalation of epinephrine in twelve asthmatic patients and four normal persons were determined as a measure of systemic absorption. The patients were all accustomed to the use of the nebulizer and were tested during an acute asthmatic attack. Pulse rates and blood pressures

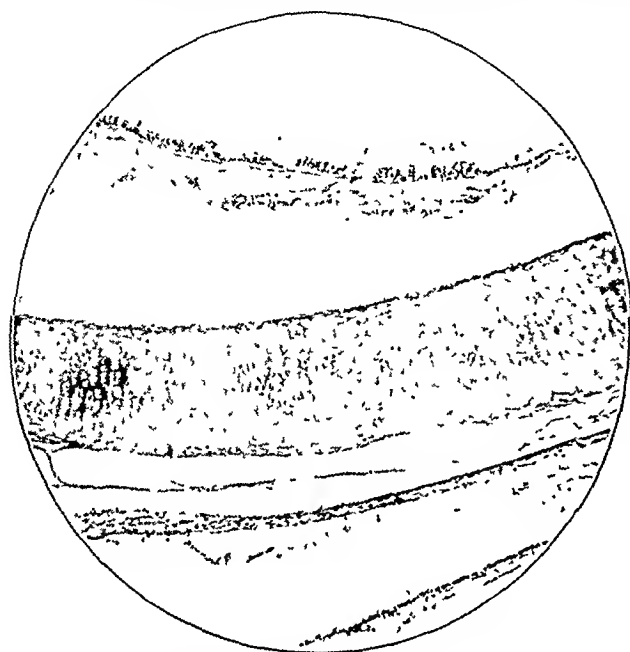


Fig. 2—Microscopic section of trachea of cat after inhalation of 1 per cent solution of epinephrine, showing loss of cilia and desquamation of epithelium, together with beginning leukocytic infiltration of submucosa.

were determined every two minutes during ten minute periods before and during inhalation of the vapor and for ten minutes afterward. The administration consisted of ten deep inspirations with the nebulizer held just within the mouth. No changes in pulse rate or blood pressure were observed in either of the groups tested. Two of the normal persons noted subjective signs of palpitation and vertigo, but they were able to produce the same sensations by deep inhalations alone without epinephrine. These results are in general agreement with the clinical reports¹ and indicate that a systemic action of epinephrine under the conditions is not common.

Animal experiments were next made for more precise determinations of systemic effects under better controlled and more varied conditions. Cats anesthetized with intraperitoneal injection of pentobarbital sodium, 35 mg. per kilogram of body weight, were used. After tracheotomy, a section of the trachea was isolated by ligation from the larynx above and the bifurcation below in order to divide the respiratory tract into three parts, namely mouth and nasopharynx, trachea, and pulmonary or bronchial airways. Arterial blood pressure was measured by means of a cannula inserted into a common carotid artery and connected to a mercury manometer recording on a kymograph. The pulse rate was counted every five minutes or oftener.

The results of instilling different volumes of solution of epinephrine into these three regions are illustrated in figure 1. No change in pulse rate or blood pressure was recorded after instillation of such large doses as 5 mg. of epinephrine into the mouth, nasopharynx or isolated trachea. That is, typical systemic

effects were not demonstrated after application to the mucosa above the bifurcation of the trachea. The bronchial mucosa, however, proved to be a good absorbing surface for epinephrine, since pulse and blood pressure changes were demonstrated after as little as 0.0002 mg. deposited in a bronchus. Considering the differences in body weight and the amounts lost in the upper air passages, a patient would require almost 100 inhalations to get an equivalent amount into his lungs and therefore to get systemic effects. This quantity could be obtained more readily, however, if compressed air were used for the vaporization, as is sometimes practiced in physicians' offices.

The failure to produce any effects from the excessive quantities applied to the tissue in the upper part of the respiratory tract makes it improbable that the solution deposited in this region is effective, acting either by reflex irritation or after absorption. In addition, the previous demonstration that to get systemic action from the solution deposited deep in the lungs would require a much more prolonged period of inhalations than is ordinarily used for therapeutic effects makes it improbable that the effectiveness depends on getting enough absorbed in the lungs for a systemic action. Therefore the anti-asthmatic actions are probably the result of the direct local effects of the epinephrine on the congested bronchial mucosa and spastic musculature, occurring independently of absorption into the general circulation.

EFFECTS OF CHRONIC INHALATION

Repeated inhalations of this strong solution of epinephrine might be expected to cause local irritation and damage to the mucosa of the upper airways, since more

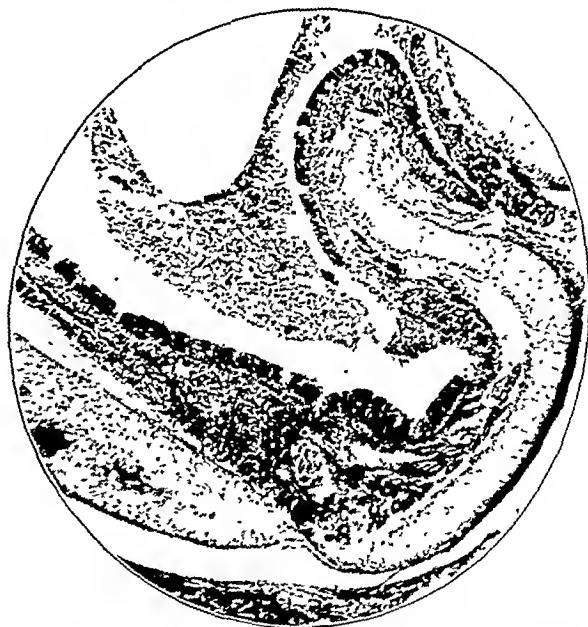


Fig. 3—Microscopic section of trachea of cat after inhalation of 1 per cent solution of epinephrine. Ulceration of mucosa with loss of epithelium, marked leukocytic infiltration of submucosa and lumen filled with mucus.

than 95 per cent of the inhaled solution is deposited in this region. Therefore ten cats and six rabbits were given the vapor for a determination of the local effects on the tissues. They were healthy animals, maintained on the standard diet of the laboratory colony. The animals were treated as follows: 1. Four rabbits and six cats were given inhalations of 1 per cent solution of epinephrine twice a day six days a week for a maxi-

num of 121 days for the rabbits and seventy-one days for the cats. The dose was ten squeezes of the atomizer bulb or 0.0085 cc. of the solution of epinephrine delivered into the mouth as the vapor at each administration. 2. As controls, two cats and two rabbits inhaled at the same time an equal volume of physiologic solution of sodium chloride vaporized with a similar nebulizer. All inhalations were given through a mouth gag with the special nebulizer recommended for patients, and the jets of vapor were synchronized with the animals' inspiration in the same manner as is practiced by patients. 3. Because Graesser and Rowe and others¹ have reported gastrointestinal upsets in patients using epinephrine by inhalation, which they ascribed to swallowing the larger droplets, two cats were made to drink 1 cc. of 1 per cent solution of epinephrine six times each week. This was continued for twenty-two days with one cat; the other cat died on the seventh day. Histologic sections were made from the respiratory tracts of all the animals dying during the course of the experiment or killed at the conclusion of the medication. The accompanying table summarizes the histologic changes observed.

The most frequent abnormality was the presence of mucus in the lumens of the bronchi. This occurred in seven of the ten animals receiving inhalations of epinephrine and in three of the six controls. The significance of this exudation is doubtful. More significant was the change illustrated in figure 2 of loss of tracheal cilia in six of the medicated animals and desquamation of tracheal and bronchial epithelium in four. These changes were not observed in any of the controls. In three of the epinephrine-sprayed animals there was a leukocytic infiltration of the tracheal submucosa which was sufficiently generalized to be termed a tracheitis, as shown in figure 3. Two cats from this group also showed evidence of bronchitis. These inflammatory reactions were not seen in the unmedicated controls. Five of the ten animals taking inhalations of epinephrine died during the course of the experiments after an average of thirty-seven days, the animals that remained being killed after an average of eighty-seven days.

Both of the animals receiving solution of epinephrine by mouth showed evidence of severe diarrhea, marked anorexia and loss of body weight, as did also one of the cats receiving the inhalations of epinephrine. Post-mortem examination of the intestinal serosa and peritoneum of these three cats indicated the presence of inflammation, and the gastrointestinal mucosa showed many small ulcerated and hemorrhagic areas. Accordingly, these applications of epinephrine produced the typical signs of local irritation in both pulmonary and gastrointestinal tissues.

The question might be raised whether similar effects might be produced in patients. It is obvious that the opportunity of examining the trachea and lungs of patients receiving inhalations of epinephrine for asthma would be comparatively rare. However, we had an opportunity of examining one patient with conditions which were confirmatory of the changes in the cats. The pertinent facts of this case may be presented, with the histologic pictures, as follows:

A man aged 60 with advanced pulmonary tuberculosis showed no clinical signs of tracheal or laryngeal involvement. Inhalations of 1 per cent solution of epinephrine were given every two hours for forty-eight hours before death. At autopsy, which was performed immediately, the trachea was reddened down to within a short distance above the bifurcation. Microscopic

examination revealed marked leukocytic infiltration throughout the reddened area (fig. 4) and areas of complete loss of epithelium with leukocytic infiltration of submucosa (fig. 5). Special stains revealed no evidence of tuberculous processes in this region, and the larynx and the bronchi below the bifurcation were free of these acute inflammatory changes, or tuberculosis. The pathologic diagnosis at this part of the autopsy was acute tracheitis produced by the inhalations.

COMMENT

The amount of epinephrine obtained from a 1 per cent solution by proper vaporization for inhalation is considerably less than the usual dose with other methods

Pathologic Changes in Rabbits and Cats Given 1 per Cent Epinephrine or Physiologic Solution of Sodium Chloride Twice a Day by Inhalation or 1 per Cent Epinephrine by Mouth

Animal and Number	Fate	Bronchopneumonia	Bronchitis	Tracheitis	Mucopus in Lumen	Desquamation of Epithelium	Loss of Cilia	Comment
Epinephrine 1 per Cent Solution by Inhalation								
Rabbit 1	Died 34 days	..	..	..	..	..	..	No gross or microscopic pathologic changes
Rabbit 4	Died 117 days	..	..	..	..	..	+	Pleural empyema
Rabbit 5	Killed 121 days	..	..	..	..	..	+	Pathologic changes limited to trachea
Rabbit 2	Killed 121 days	..	..	..	..	..	+	Pathologic changes limited to trachea
Cat 3	Died 6 days	..	..	..	..	..	..	Normal respiratory tract; marked gastro enteritis
Cat 1	Died 8 days	..	..	..	..	..	+	Extensive inflammatory changes
Cat 2	Died 15 days	..	..	..	..	..	+	Lower half of trachea plugged with mucus
Cat 6	Killed 54 days	..	..	..	..	..	..
Cat 4	Killed 71 days	..	..	..	..	..	..	No changes in lungs or small bronchi
Cat 5	Killed 71 days	..	..	..	..	..	..
Physiologic Solution of Sodium Chloride Inhalation								
Rabbit 1c	Died 82 days	..	..	..	..	..	..
Rabbit 2c	Killed 121 days	..	..	..	..	..	..	Normal
Cat 1c	Killed 71 days	..	..	..	..	..	..	Trachea and lungs normal
Cat 2c	Killed 71 days	..	..	..	..	..	..	Trachea and lungs normal
Epinephrine 1 per Cent Solution by Mouth								
Cat 11	Died 7 days	..	..	..	..	..	+	Gastro enteritis and loss of weight
Cat 12	Killed 22 days	..	..	..	..	..	..	Gastro enteritis and loss of weight; respiratory tract normal

of administration. A patient taking ten deep inhalations of the vapor from a hand atomizer receives not more than 0.08 mg. of epinephrine into his mouth. Only about one one-hundredth of this quantity gets down to the bronchioles, where it produces its therapeutic effects. The minimum intravenous dose of epinephrine required to produce just demonstrable systemic effects is of the order of 0.001 mg. per kilogram of body weight, or about 0.07 mg. for an average adult. Assuming that the total amount of vapor sprayed into the mouth reached the lung and was instantly and completely absorbed, the dose of epinephrine would be barely enough to produce a trace of action after systemic distribution. However, since not more than about one one-hundredth of the inhaled epinephrine vaporized

in the mouth gets to the lungs, it is improbable that enough would be absorbed for a circulatory action. Therefore it is not surprising that clinical pulse rate or blood pressure changes are usually not demonstrable after inhalation of epinephrine. Nielsen reached the same conclusion when he found the dose of epinephrine

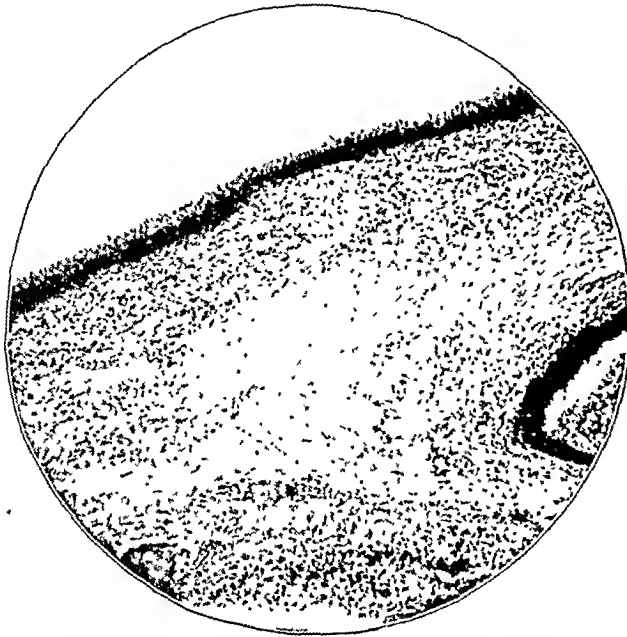


Fig. 4—Microscopic section of tracheal mucosa of a patient who received inhalations of 1 per cent solution of epinephrine every two hours for forty-eight hours preceding death; marked leukocytic infiltration.

by inhalation to be considerably less than the systemic dose for an effect in the same patient. These results taken together indicate that the relief of asthmatic symptoms after inhalations of epinephrine is the result of a local or direct action of the epinephrine on the bronchial muscle or mucosa, the greater effectiveness for this condition being presumably due to the direct contact of the drug with the site of action.

As for the possible objectionable side actions from repeated inhalations of epinephrine, very definite pathologic changes were demonstrated by us in the respiratory tissues of some of the animals used and in the patient who had inhaled 1 per cent solution of epinephrine. In spite of the small total amount of epinephrine that is deposited on the mucosa, each droplet contains a very high concentration of the drug. It may be that the local irritant effect of each droplet is just as great for the point of deposition as that which would result from the application of a greater volume to a proportionately larger area.

The type of lesion observed in the tracheal and bronchial mucosae is in many ways similar to lesions produced by Fox⁵ by spraying the nasal mucosa of rabbits with 1:1,000 solution of epinephrine hydrochloride. After daily applications for three months he found considerable denudation and intra-epithelial abscesses with leukocytic infiltration. The irritant power of even this ten times weaker solution is therefore well known for the nasal mucosa in animals as well as in patients. There can then be little doubt that a stronger solution, i. e. ten times, or the 1 per cent strength, would produce greater local irritation, as was indeed demonstrated by us.

The solution of epinephrine used in our experiments, like many epinephrine products on the market, contains about 0.2 per cent sodium bisulfite to prevent oxidation of the drug. It has not been determined whether the irritation in the respiratory tract is due to the epinephrine itself, to the high acidity or to the preservative. In a recent publication, Tainter, Thronsdon and Lehman⁶ described the irritant actions of sodium bisulfite on other mucous membranes. They showed that concentrations of this salt comparable to those in commercial epinephrine products were sufficient to produce local inflammatory reactions. However, the vasoconstriction probably contributes mainly to the local reaction, since it is well known that concentrations of epinephrine greater than 1:10,000 are apt to produce such prolonged vasoconstriction as to cause tissue damage from anoxemia with secondary inflammatory reactions.

Finally, there may be considered the bearing of these various observations on the clinical use of inhalations of epinephrine. There is no doubt that in many patients asthmatic attacks can be controlled by inhalation of strong solutions of epinephrine. There can also be little doubt that in some if not all patients the solution of epinephrine will produce inflammatory changes in the upper respiratory passages and possibly also in the gastrointestinal tract if droplets are swallowed. The more efficiently the patient breathes and draws the vapors into the deeper airways, the more extensive will be the inflammatory changes. If the concentration of the epinephrine should be increased from the 1 per cent strength now commonly employed to the 10 per cent strength advocated by Nielsen,¹ the possibility of local

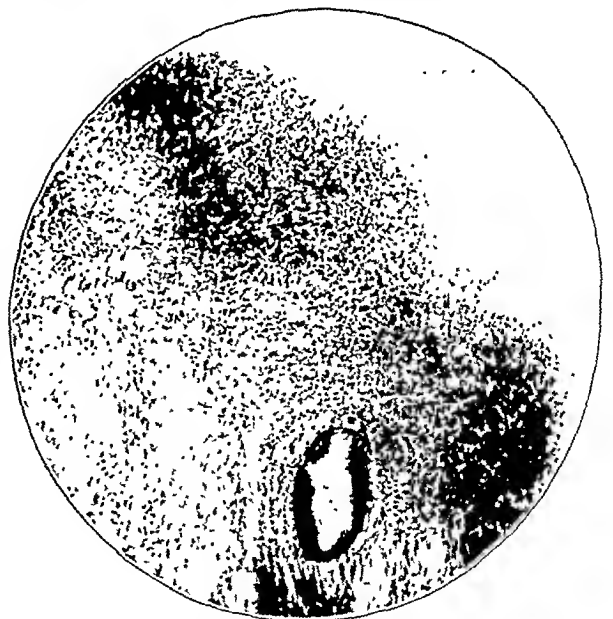


Fig. 5.—Another area from same patient, showing complete loss of epithelium and more marked round cell infiltration.

injurious effects would be still greater. The main reason for using the inhalation procedure is that it saves the patient the inconvenience of hypodermic injections. However, if this advantage is obtained at the expense of setting up inflammatory reactions in the mucosae of the respiratory passages, which are already the seat of a morbid process, the secondary effects of the inhalation

5. Fox, Noah: Chronic Effect of Epinephrine and Ephedrine on Nasal Mucosa, *Arch. Otolaryng.* 15: 73 (Jan.) 1931.

6. Tainter, M. L.; Thronsdon, A. H., and Lehman, A. J.: *Proc. Soc. Exper. Biol. & Med.* 26: 584 (June) 1937.

may prevent or delay restoration of these tissues to normal, even though the spasmodic attack is alleviated. The clinician would therefore seem to be under the necessity of deciding in each individual case whether the gain in convenience of medication by inhalation is great enough to justify the possible production of added pathologic changes.

SUMMARY AND CONCLUSIONS

1. Epinephrine, in strengths of 1 per cent or more, is used extensively by inhalation in the treatment of asthma. This procedure introduces smaller quantities of the drug into the lung than those clinically effective by injection.

2. There is no demonstrable absorption of epinephrine from the respiratory tract in cats, except deep in the lungs. However, from the lungs, blood pressure effects can be produced from minute doses, indicating good absorption from the lower respiratory mucosa, and the possibility of producing direct effects by the drug on the bronchiolar muscle and mucosa.

3. Inhalation of 1 per cent solution of epinephrine at frequent intervals in cats and rabbits produces in some animals an irritation of the tracheal mucosa, with desquamation of the epithelium and inflammatory changes. Similar changes were observed in the trachea of a tuberculous patient similarly medicated for forty-eight hours before death.

4. Careful consideration should be given by the physician to the possible occurrence of undesirable local irritative effects from inhalations of epinephrine such as those demonstrated by us, and whether these are great enough in the individual patient to outweigh the convenience of taking the drug by inhalation rather than by injection.

Sacramento and Webster streets.

Clinical Notes, Suggestions and New Instruments

ADENOCARCINOMA OF THE BREAST COINCIDENTAL WITH STRENUOUS ENDOCRINE THERAPY

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Estrogenic substance induces mammary cancer in mice usually only after several months' application. The carcinogenic agents likewise require considerable periods of application. Injections of estrogenic substance or of carcinogenic chemicals in rather excessive doses may shorten the time of appearance of experimental tumors.

The ordinary therapeutic doses of estrogenic substance and the rather short periods of treatment should not involve a risk of the subsequent development of cancer. A substitution therapy extending over many months does involve such a risk, especially if the woman treated presents a family history of mammary cancer and may thus supposedly be classed as susceptible.

Cramer¹ has presented an excellent review of the etiology of mammary cancer in man and in mice. Olch² expressed the belief that prolonged ovarian activity during the usual menopausal ages is detrimental or of no benefit to the mammary

parenchyma. Crossen and Hobbs³ noted the high incidence of delayed menopause in cases of adenocarcinoma of the body of the uterus. Wassink's⁴ statistical study on Dutch people showed that family history, as regards mammary cancer, was exceedingly important. Waaler's⁵ observations in Norway lead to similar opinions. Lacassagne⁶ suggested that in experimental animals the hereditary factor for cancer of the breast may consist in an unequal response of the breast in the different strains to similar doses of estrogenic substances. Cramer⁷ more

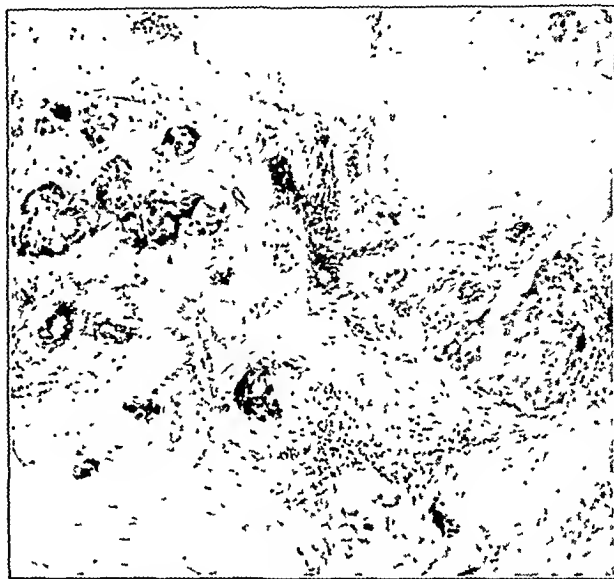


Fig. 1.—Section of the original tumor, showing obliteration of the ducts and fibrosis.

recently demonstrated that mouse strains bearing a high incidence of cancer of the breast are more susceptible to estrogenic substance. It appears also from his work that the pituitary thyrotropic factor antagonizes the susceptibility to estrogen. A clinical investigation to determine if possible methods of identifying women who are unusually responsive to estrogenic agents is urgently needed. There is also much room for consideration of the family histories in the early diagnosis of mammary cancer.

The following case is offered as an instance of what we believe to be an unwise use of estrogenic substance during the menopausal period. The adenocarcinoma of the breast in this instance, coincidental though it may be, tends to incriminate the heavy and prolonged estrogen treatment used:

REPORT OF CASE

History.—A white woman aged 50, a nurse, never married, entered the hospital in February 1938, complaining of a tumor mass in the right mammary gland, slightly painful and tender to pressure. There had been no loss of weight. The onset had occurred three weeks before admission to the hospital. While reaching to clean a wall of her home she had felt a pain in her right breast, and on examination she observed a lump which was tender to palpation. On consulting a physician she was referred to the hospital.

Menstruation began at the age of 11 years and continued regularly to the age of 48. In September 1936 she consulted a physician for symptoms of weakness and fatigue following

3 Crossen, R. J., and Hobbs, J. E. Relationship of Late Menstruation to Carcinoma of the Corpus Uteri, *J. Missouri M. A.* 32: 361 (Sept.) 1935. Crossen, H. S., and Crossen, R. J. Amenorrhea; Menorrhagia, Metrorrhagia, Delayed Menopause, *Am. J. Surg.* 33: 345 (Sept.) 1936.

4 Wassink, W. F. Cancer et hérédité, *Genetica* 17: 103-144, 1935.
5 Waaler, G. H. M. Ueber die Erbllichkeit des Krebses, in the series of Skrifter utgitt av Det Norske Videnskaps Akademi i Oslo. I. Mat. Naturf. Klasse No. 2, 1931, abstr., *Cancer Review* 7: 464 (Nos. 2 and 10) 1932.

6 Lacassagne, A. A Comparative Study of the Carcinogenic Action of Certain Oestrogenic Hormones, *Am. J. Cancer* 28: 735-740 (Dec.) 1936.

7 Cramer, W., and Horning, E. S. The Prevention of Spontaneous Mammary Cancer in Mice by the Thyrotropic Hormone of the Pituitary Gland, *Lancet* 1: 72-76 (Jan. 8) 1938.

From the Tumor Clinic and Cancer Research Unit, Veterans Administration Facility.
Drs. Hugh Scott, W. E. Kendall and L. H. Prince and Mr. R. P. Creer assisted in the preparation of this paper.

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1 Cramer, W. On the Aetiology of Cancer of the Mamma in the Mouse and in Man, *Am. J. Cancer* 30: 318-331 (June) 1937.

2 Olch, I. Y. The Menopausal Age in Women with Cancer of the Breast, *Am. J. Cancer* 30: 563-566 (July) 1937.

physical exertion. She was told that her blood pressure was low and was given estrogenic therapy, receiving 2,000 units intramuscularly twice a week for twenty-six weeks. At this time she consulted another physician, and this type of therapy was continued. She was given one injection of 10,000 units of estrogen and then 2,000 units three times a week for six months. During this time she did not menstruate, but occasional fullness of the breast was noted. In the fall of 1937, when she voluntarily stopped the injections, there was a copious menstrual flow lasting one week. There has been none since.

She had had measles, mumps and chickenpox in childhood and pneumonia at the age of 9 years and again at 20, with complete recovery. Tonsillectomy had been done in 1920. She had been admitted because of a mild depressive psychosis in March 1931 and discharged improved in July 1931. She was readmitted in October 1935, when an atypical mucous cyst of the lower lip was removed and hyperkeratosis of the left cheek was treated by superficial irradiation. She was discharged in November 1935, with maximum benefit. She had always been declared competent as to her psychosis, and at this time, although worried about her breast, she had good insight and judgment was not defective.

Her mother died at the age of 63 of carcinoma of the liver and her father at 72 of nephritis and cardiac disease. Five

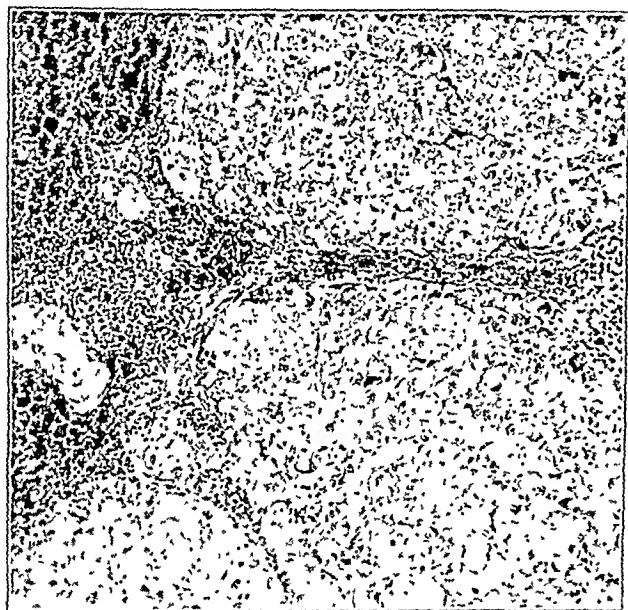


Fig. 2.—Section of metastatic nodule.

brothers reached adulthood but had all died from various causes other than cancer. Four older married sisters had no history of cancer.

Examination.—The patient was well developed and somewhat obese. Her height was 67 inches (170 cm.) and her weight 186 pounds (84.4 Kg.). In the upper outer quadrant of the right breast a tumor mass 5 by 7 cm. in diameter was present. This was not attached to the deeper structures or to overlying skin. There was no retraction and no discharge from the nipple. No adenopathy was noted in the drainage areas. The left breast was apparently normal. General examination showed no further abnormality. The urine showed a trace of albumin and a moderate number of white blood cells. The Wassermann and the Kahn test were negative. A blood count was within normal limits. X-ray examination of the chest showed no abnormality.

Course.—Radical mastectomy was performed, with careful dissection of the axilla and removal of both pectoral muscles. A study of the removed specimen showed several small nodes just adjacent to the primary tumor. Microscopic examination showed adenocarcinoma in both the primary tumor and the metastatic nodes.

The patient received a full course of postoperative irradiation.

COMMENT

The total dose of estrogen (258,000 units injected) used in this case may not seem high. The therapy, however, was practically continuous for over a year. That no menstrual periods occurred in this interval rather substantiates the factor of continuous dosage, as do the prolonged menses when the treatment was discontinued. The patient's history indicates periodic if not rather constant stimulation of the breast during the period of therapy. This feeling of fullness in the breast was not noted after discontinuance of the estrogen therapy. There was but one instance of cancer in the family and that not cancer of the breast.

In our experience papillomas of the mammary duct similar to that noted in Schimmelbusch's disease may be induced in experimental animals in short periods with low doses of estrogen. More prolonged experimental treatment brings forth typical tumors of the breast. It is not our intent to generate cancerphobia or to discourage the correct therapeutic use of estrogenic preparations. We feel, however, that there is some question whether prolonged and continuous therapy, as in the case reported, is compatible with the normal physiologic endocrine balances. At the menopause nature is attempting to close a period and to readjust biologically the tissues concerned. Correct endocrine therapy should, it would seem, be planned to aid the natural physiologic procedures. Continuous estrogen therapy would maintain this agent at a high level in the body. A consistently high estrogen level is certainly unphysiologic as is evident from studies on estrogen excretion. More attention should be given to timing and to tapering off the doses of estrogen when this agent is employed for therapeutic effect during the menopausal period.

ANTERIOR POLIOMYELITIS TREATED WITH SULFAPYRIDINE

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In view of the variation in the severity of the infection causing anterior poliomyelitis, with its differences in clinical picture, its symptomatology and its resulting paralysis, one case report is not of great value. The case here reported is interesting because the patient was seen during the acute stage and rather surprising results were had accompanying the use of sulfapyridine in the treatment.

History.—M. E. M., a well developed girl aged 9 years, weighing 65 pounds (29.5 Kg.), was first seen March 22, 1939, complaining of pain in the right leg and inability to walk without falling; onset had occurred two days before with fever, headache, pains in the back and legs, and general malaise.

Examination.—The temperature was 101, pulse 120, respiratory rate 20.

The skin, eyes, nose, throat, lungs, heart and abdomen were all entirely normal.

Examination of the right leg revealed the knee jerk reflex absent; the patient was unable to flex the thigh on the pelvis or flex the foot on the leg. Kernig's sign was positive. Oppenheim's and Babinski's signs were normal. There was no disturbance of sensation. Examination of the left leg revealed the knee jerk exaggerated. There was muscular tenderness throughout the thigh with normal flexion of the thigh on the pelvis and the foot on the leg. Kernig's sign was positive. Oppenheim's and Babinski's signs were normal or negative.

The patient was unable to stand on the right leg alone but could stand on both legs and walk with help with a slight dragging of the right foot and toe.

The arms, forearms and hands were normal. Function was good.

The posterior neck muscles were rigid and the patient was unable to flex the head on the chest without pain. There was no opisthotonos.

The pupils were of normal size and they reacted well to light and distance.

Ten cc. of clear spinal fluid was withdrawn; the pressure was slightly increased but returned to normal with this volume removed. Cell count in undiluted fluid was 100. Stained

smears showed 50 per cent polymorphonuclears and 50 per cent lymphocytes. No organisms were found with three Gram stains. Sugar was normal, a trace. Globulin was present with a heavy trace. Cultures were made on blood agar plates and reported at intervals of twelve, twenty-four, forty-eight and seventy-two hours.

The urine, March 23, was normal except for a slight trace of albumin. March 26 it was normal except for a slight trace of acetone. March 27 it was entirely normal.

March 23 there were 4,330,000 red blood cells, 85 per cent hemoglobin, 8,900 white blood cells, 64 per cent polymorphonuclears, 31 per cent lymphocytes, 4 per cent large mononuclears and 1 per cent basophils.

March 24 there were 4,210,000 red blood cells, 82 per cent hemoglobin, 9,750 white blood cells, 76 per cent polymorphonuclears, 29 per cent lymphocytes, 2 per cent large mononuclears and 1 per cent basophils.

March 25 there were 4,150,000 red blood cells, 82 per cent hemoglobin, 9,050 white blood cells, 70 per cent polymorphonuclears, 23 per cent lymphocytes, 5 per cent large mononuclears and 2 per cent basophils.

March 26 there were 4,150,000 red blood cells, 80 per cent hemoglobin, 6,450 white blood cells, 71 per cent polymorphonuclears, 22 per cent lymphocytes, 5 per cent large mononuclears and 2 per cent eosinophils.

March 27 there were 4,080,000 red blood cells, 80 per cent hemoglobin, 5,600 white blood cells, 70 per cent polymorphonuclears, 25 per cent lymphocytes, 4 per cent large mononuclears and 1 per cent eosinophils.

Treatment and Medication.—The patient entered the hospital March 22, 1939, at 9 p. m. The usual routine blood, urine and spinal puncture were done. Neoprontosil 15 grains (1 Gm.) every four hours for three doses was started at 11 p. m.

On the morning of March 23 examination was essentially the same as previously detailed, with the additional observation of toe drop with the foot extended and the thigh flexed on the pelvis on the right side, and paresthesias of both forearms and the little fingers of both hands. A molded plaster of paris splint was applied to the leg and foot at this time.

Sulfapyridine was started at 4 p. m., seven $\frac{7}{10}$ grain tablets every two hours for twelve doses, at which time the temperature was 103.4 F., the pulse 130 and respiratory rate 28, with the blood picture 4,330,000 red blood cells, 85 per cent hemoglobin, 8,900 white blood cells, 64 per cent polymorphonuclears, 31 per cent lymphocytes, 4 per cent large mononuclears and 1 per cent basophils. The temperature returned to normal and remained so for twelve hours. The drug was temporarily discontinued, because the patient was slightly cyanotic and increasingly irritable, with anorexia, but was again started when the temperature returned to 100, in the same dosage, every three hours for six more doses. The temperature again returned to normal for a twelve hour period; the drug was discontinued, and the temperature returned to 99 for a two hour period only twice since sulfapyridine was stopped, and has been normal or subnormal for the past five days. The change in the blood picture with regard to giving sulfapyridine was as follows: March 23, 4,330,000 red blood cells, 8,900 white blood cells, 85 per cent hemoglobin. March 27, 4,080,000 red blood cells, 5,600 white blood cells, 80 per cent hemoglobin. The kidney function and urine were essentially normal at the onset and no untoward effects were noticed with the treatment. The slight rigidity of the neck muscles rapidly disappeared. The spinal fluid showed no growth on culture at twelve, twenty-four, forty-eight and seventy-two hours. The patient's general condition has satisfactorily improved. There is no further muscular paralysis than was present at the first visit, which was the third day after onset. The right leg and foot from the hip is in a molded splint, with no deformity, and the neurologic manifestations on this side are still an absent knee jerk and inability to flex the thigh on the pelvis or flex the foot on the leg.

CONCLUSIONS

This case could have terminated as it has in paralysis of the flexor muscles of the foot, leg and thigh of the right side without the use of sulfapyridine and not be unusual in any way; others have done it; but (1) the apparent dramatic response of the white blood cell count, (2) the drop in tem-

perature from 104.5 to normal in twenty-four hours, remaining so for twelve hours and again responding to medication the second time, with continued approach to normal of the white blood cell count, and (3) the relief of the paresthesias, all so closely following the administration of sulfapyridine, leave us to determine whether this drug has a virtue in anterior poliomyelitis.

Take the report for what it is worth, but further use, properly given, is certainly justified in such cases, especially in patients seen early in the disease, as this case shows. I do not make the slightest claim of sulfapyridine being specific, having only a lingering hope for the future.

300 Masonic Building.

HEMORRHAGIC MUCOCELE OF THE APPENDIX

THOMAS F. HEATLEY, M.D., TOLEDO, OHIO

V. R., a high school girl aged 16, was admitted to the hospital Aug. 10, 1935. She had been in good health except for what she termed minor attacks of indigestion intermittently during the past two years. The attacks were never serious enough for her to consult her physician. On the morning of August 9 after arising she was taken with a dull aching pain in the right lower quadrant of the abdomen which did not radiate. The patient suffered profound nausea and vomited seven times during the day. There was no history of constipation and her menstrual periods were regular.

On admission to the hospital the patient's temperature was 100 F., the pulse 110 and the leukocyte count, 30,700. There was a definite palpable tumor mass in the right lower quadrant of the abdomen, exquisite tenderness over McBurney's point and an early peritoneal reflex. There was no abdominal distention; the last menstrual period had been normal and within

ten days. A diagnosis of ovarian tumor with twisted pedicle was made and immediate operation advised.

Under ether anesthesia the abdomen was opened through a right paramesial incision and a tumor was exposed in the right iliac fossa. The tumor was entirely



Mucocoele after removal, showing its tremendous size as compared with the appendix and its position lateral to the appendix.

free of adhesions. The gallbladder and stomach and both kidneys were normal and there was no obstruction of the bowel. This tumor was dark in color and shaped like a cucumber. The appendix appeared to lie at its distal end and was attached approximately an inch from the junction of the appendix to the caput coli. The apparent pedicle was twisted about 120 degrees, and this whole mass was gangrenous. The tumor was removed from the appendix and the appendix was removed in the routine manner without drainage.

Convalescence was without incident and the patient was discharged in good condition on the eleventh postoperative day.

The gross appearance demonstrated a large, soft tumor with a thin, connective tissue wall almost bisected, thus forming two lobes filled with coagulated blood. The tumor was attached to the appendix. Section was made of the thin wall. The appendix, 6.5 cm. by 1 cm. at the proximal end, tapered to 6 mm. at the tip; the tumor was attached to the proximal portion by a small pedicle.

The microscopic section of the cyst wall filled with blood and showed hemorrhagic mucosa supporting only a few mucous glands, which showed hemorrhage into their lumens; the solitary follicles were enlarged, the lymphoid cells being pushed apart by edema and hemorrhage. The submucosa was edematous, its blood vessels were enlarged and congested and there was a large amount of hemorrhage into this coat; the muscular

Dr. Warren Howard permitted me to publish a report of this case. Dr. James B. Rucker gave his cooperation in the interpretation of the pathologic picture and Dr. George W. Bascom reviewed the literature.

coats were normal in thickness but were infiltrated with many lymphoid cells and a slight amount of hemorrhage.

The diagnosis was hemorrhagic mucocele of the appendix.

My interest in mucocele of the appendix was stimulated not only because of the rarity of this abnormality but also because it is a challenge to the diagnostic acumen of the general surgeon.

The frequency of the disease is of interest because, in reviewing the literature, I find that there have been approximately 250 cases reported since Virchow's¹ classic description of mucocele in 1863. Castle,² in a total of 13,158 autopsies, found twenty-eight cases, or a frequency of about 0.2 per cent. Mayo and Fauser³ reviewed the surgical cases of the Mayo Clinic from 1917 to 1930 and found that mucocele of the appendix was encountered only seventy-six times in 31,200 cases in which appendectomy had been performed, a frequency of about 0.24 per cent.

A description of the pathologic changes occurring in the development of mucocele of the appendix is found in the work of Deaver,⁴ and Vorhaus.⁵

The first process, according to Vorhaus, is assumed to be due to recurrent infections of the appendix causing a gradual stenosis of the lumen at one or more points distal to the obliterated lumen; sterile contents are presupposed. Then in the presence of actively secreting mucous glands a distention occurs, and theoretically there is a change in the mucus resulting in the transformation of mucin into pseudomucin.

The facts favoring this theory are as follows: There is a complete or almost complete stenosis of the lumen, or else with the increasing distention the fluid would be forced out. Secondly, there cannot be any pathogenic bacteria or else empyema or gangrene would result. Lastly, an active mucous membrane secreting mucus in excess of its absorption is necessary or distention would not occur. This results in the development of either rupture of the mucocele causing pseudomyxoma peritonaei or a thin walled watery cyst due to cessation of activity of the mucous glands which eventually becomes atrophic as a result of pressure atrophy. In my case the cystic fluid was hemorrhagic, probably owing to a ruptured blood vessel after the proximal portion of the appendix had become twisted.

Thus the rupture of a mucocele into the peritoneal cavity produces a condition of potential malignancy, pseudomyxoma peritonaei, the resulting effect on the patient and future response to treatment depending entirely on whether or not the mucous membrane lining the mucocele has been sufficiently destroyed by pressure atrophy.

The most common cause of pseudomyxoma peritonaei is due to pseudomucinous cystadenoma of the ovary. Therefore it is more frequent in the female, while mucocele of the appendix is the only known cause of pseudomyxoma peritonaei in the male.

The symptoms are vague and not characteristic of any specific clinical entity, especially the uncomplicated cases. Other than a history of (1) abdominal distress, (2) a palpable mass in the right lower quadrant of the abdomen, there are no other constant features. These points were the only constant factors mentioned by both Mayo and Fauser³ and Dannreuther⁶ in their reports. Although my patient had the symptoms of an acute surgical condition within the abdomen, which was due to a 120 degree rotation of the mucocele on the proximal portion of the appendix, these acute symptoms may be those of obstruction of the intestine, which has been reported to occur when the mucocele becomes invaginated into the cecum.

However, as a rule most of these patients tolerate these vague symptoms until they become so distressing and the pain so intensified that they voluntarily seek relief.

The diagnosis of mucocele of the appendix or pseudomyxoma peritonaei of appendical origin is usually made at autopsy, or at the operating table in a case with a preoperative diagnosis of

ovarian tumor with or without a twisted pedicle, uterine fibroids, carcinoma of the cecum, terminal ileitis, intestinal obstruction or intraperitoneal neoplasm. In my case a diagnosis of ovarian tumor with twisted pedicle was made because of the acute onset of symptoms, the exquisite tenderness, the fever and the high leukocyte count. The disease is most common in middle aged and elderly women although my patient was only 16. There are no constant symptoms or signs which are pathognomonic of this disease. While roentgenographic evidence of mucocele of the appendix following a barium enema was used by Vorhaus,⁵ Simon,⁷ LeWald⁸ and Lifvendahl and Ries⁹ in the only preoperative diagnosis of mucocele of the appendix, this procedure does not always give constant results, since usually the lumen is stenosed or at best there may be an occasional mucocele with intermittent patency of the proximal end of the appendix.

However, with a history of vague gastrointestinal complaints and a palpable tumor mass in the right lower quadrant of the abdomen one should at least include mucocele of the appendix in the differential diagnostic considerations.

The treatment of mucocele of the appendix and pseudomyxoma peritonaei is definitely surgical. In the uncomplicated cases surgical removal is done with extreme caution to prevent rupture of the mucocele, while in complicated cases of mucocele of the appendix with pseudomyxoma peritonaei removal of the remaining parts of the ruptured mucocele and removal of as much of the mucoid gelatinous material and implants as possible are followed with roentgen therapy.

CONCLUSIONS

1. Mucocele of the vermiform appendix is a clinical rarity but is important because of its disastrous complications.
2. Its clinical incidence is approximately 0.24 per cent.
3. It is one of two known causes of pseudomyxoma peritonaei.
4. The clinical diagnosis is extremely difficult unless this condition is kept in mind, since there are no constant pathognomonic signs or symptoms especially incident to mucocele of the appendix.
5. The treatment is surgical.

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SULFANILAMIDE IN THE TREATMENT OF SMALLPOX

WALTER O. McCAMMON, M.D., SPRINGFIELD, KY.

I have recently treated seven cases of smallpox, four with sulfanilamide and three with symptomatic treatment:

CASE 1.—Mrs. G., aged 44, a housewife, white, first observed Jan 18, 1939, complained chiefly of severe backache and fever coming on rather suddenly during the preceding night. At first she felt chilly but did not have a definite rigor. This was accompanied with severe aching of the back in the lower lumbar region, across the hips and down the back of the legs. There was considerable headache and some nausea but no vomiting. There was some discomfort in the throat but no cough. There was no constipation, diarrhea or disturbance of the urinary system. There had been very little sweating. The patient was rather obese and appeared to be extremely ill. The skin was dry, the face was flushed and there was some restlessness. The temperature was 103.2 F.; the pulse rate 96 and the blood pressure 140 systolic, 90 diastolic. The eyes and nose were not congested but the throat showed red, cryptic, slightly enlarged tonsils and some redness of the pharynx. The chest was clear and there was no cardiac irregularity. There was no abdominal tenderness and no enlargement of the abdominal organs. The reflexes were normal. There was no rash on the skin. The urine showed a slight trace of albumin, with a high specific gravity but no pus cells, casts or erythrocytes.

The patient was given acetylsalicylic acid 5 grains (0.32 Gm.) every three hours; there was no question of her not staying in bed. The following day there was little change in the patient's condition other than a slight lowering of the temperature (101

7. Simon, Stefan, quoted by Vorhaus.⁵

8. LeWald, quoted by Vorhaus.⁵

9. Lifvendahl, R. A., and Ries, Emil: *Am. J. Surg.* 17: 270 (Aug.) 1932.

1. Virchow, Rudolf: *Die krankhaften Geschwülste*, Berlin, Hirschwald 1: 250, 1863.

2. Castle, O. L.: *Ann. Surg.* 61: 582, 1915.

3. Mayo, Charles, Jr., and Fauser, J. U., Jr.: *Minnesota Med.* 15: 254 (April) 1932.

4. Deaver, J. B.: *Appendicitis: Its Diagnosis and Treatment*, ed. 4, Philadelphia, P. Blakiston's Sons & Co., 1913, pp. 107-109.

5. Vorhaus, M. G.: *Recognition of Some of the Less Common Diseases*, J. A. M. A. 94: 165-169 (Jan. 18) 1930.

6. Dannreuther, W. T.: *Am. J. Obst. & Gynec.* 31: 342-351 (Feb.) 1936.

F.). The acetylsalicylic acid seemed to ease the aching somewhat. On the third day the temperature was normal and the patient was feeling much better and was up about her household duties. On the fifth day the patient came to my office complaining of a "breaking out." She was covered—scalp, face, chest, arms, legs, palms and soles—with about 200 pustules about the size of a small pea, sitting on a red areolar base. On the palms and soles the pustules were very hard and tense. They contained a semipurulent material, which on smears showed short chained streptococci. On the seventh day definite umbilication was seen; on the ninth the pustules were beginning to dry, and on the thirteenth they were desquamating. The eruption was accompanied by a slight elevation of temperature (from 99 to 100.6 F.) and mild prostration.

CASE 2.—H. G., aged 18, the son of patient 1, a farmer, first seen February 5, complained chiefly of severe backache and headache, some nausea but no vomiting. The onset had been rather sudden the night before when a rather severe chill was experienced while he was attending a movie. There was no cough, constipation or symptom referable to the urinary tract. The symptoms followed the identical pattern of those presented by his mother. The patient was well developed and well nourished. The skin was dry and clear. The temperature was 104 F., the pulse rate 110 and the blood pressure 118/80. Otherwise the examination was negative. He was given acetylsalicylic acid 5 grains every three or four hours and sulfanilamide 10 grains (0.65 Gm.) every three hours. The following day the patient's condition was unchanged except for very slight cyanosis of the lips and some duskeness of the skin. There was no rash. On the third day the temperature was 99 F. and the patient felt much better. The aching had abated but there was some nausea. The dosage of sulfanilamide was reduced to 5 grains every four hours. On the fourth day the temperature was 98.2 F. and the patient was much improved. There were three very small dark red macules on the right forearm and three or four in the scalp. These were rather tender and caused some itching. On the sixth day the patient was out of bed and the following day he was attending to his farm work. The macules disappeared on the sixth day and there was no further eruption.

CASE 3.—Mr. F. G., aged 53, the husband of patient 1, a farmer, first seen February 8, complained chiefly of severe headache across the forehead; there was also some backache and generalized aching in the limbs. There were no other complaints. The temperature was 102 F., the pulse rate 96 and the blood pressure 138/96. The examination was otherwise negative. He was given acetylsalicylic acid 5 grains with phenobarbital one-half grain (0.032 Gm.), but this gave no relief and dilaudid $\frac{1}{2}$ grain (0.002 Gm.) was given at intervals of about ten hours to relieve the aching. Marked restlessness and semidelirium also developed. On the third day the temperature, which had varied between 101 and 103 F., fell to 99 F., and the next day there was a widespread eruption of discrete red macules and papules about the size of a pea, the temperature became elevated again to 101 F., and the papules and macules in two days were well marked pustules, which soon became umbilicated. On the eleventh day of the disease they began drying up and on the fifteenth day they were practically all gone. The patient had been vaccinated forty years before. None of the other patients in this series had been vaccinated.

CASE 4.—Mrs. S., aged 30, daughter and neighbor of patient 1, a housewife, had been in and out of her mother's house while her mother was ill and became ill February 6 with symptoms very similar to those described in the foregoing cases, namely backache, headache, fever and some nausea. I first saw her February 7. The temperature ranged from 102 to 104 F. for three days and on the fourth day returned to normal. During this period she received sulfanilamide 10 grains every three hours and acetylsalicylic acid 5 grains as needed. On the fourth day a few small macules were noted on the wrists and forehead. The medication was discontinued on the fifth day, the macules disappeared on the sixth and she was about her household duties on the seventh.

CASE 5.—Mr. C., aged 34, a son-in-law of patient 1, a farmer, when first seen, February 8, had been ill for two days, com-

plaining of intense backache, headache and high fever. The patient was well developed and well nourished and was apparently very ill. The temperature was 104 F. Acetylsalicylic acid 5 grains with phenobarbital one-half grain gave some symptomatic relief. On the fourth day the temperature was normal and no eruption was noted. On the fifth day, however, many macules were noted over the body which rapidly became papular, then vesicular and pustular, followed by umbilication on the ninth day of the disease and drying up and crusting on the fifteenth. The eruption, as in the other cases described, covered the entire body including the palms and soles, and there were some papules in the pharynx and nose.

CASE 6.—Mrs. C., aged 30, a daughter of patient 1, a housewife, was first seen February 18 after being ill about thirty-six hours. She had had a rather sudden onset, had complained of intense backache and headache and had vomited twice. The history and symptoms were identical with those in the preceding cases. Her temperature was 103 F. She was given sulfanilamide 5 grains every three hours and acetylsalicylic acid as needed for the aching. On the fourth day the fever subsided and on the sixth there were three well defined vesicles on the right cheek which went through the typical evolution of pustulation, umbilication and desquamation. During the last phase of the disease there was some slight elevation of temperature (from 99 to 100 F.). On the tenth day of illness she was out of bed and feeling fairly well.

CASE 7.—Mr. W., aged 30, white, a farmer, first seen February 23, had spent the night with patient 3 on February 15. During the night of February 22 he rapidly became very ill; he had a light chill that lasted fifteen minutes and aching of the back and limbs, and he vomited. When he was seen he was very restless. The temperature was 104.2 F. The pulse was 110. There were no significant changes found on examination other than the fever and the restlessness. Morphine one-fourth grain (0.016 Gm.) was required to relieve the backache. He was given sulfanilamide 10 grains every three hours. On the fourth day the temperature was normal and he was feeling very well. A few macules developed on the forearms which lasted about twenty-four hours. He was back at work on the seventh day.

COMMENT

These seven cases are all identical as to onset and the initial period, typical of smallpox. All show a sudden onset of severe and excruciating backache and headache with an abrupt rise in temperature persisting for three days. There seemed to be very little variation in the patients who received sulfanilamide and those who did not. However, in the patients who received sulfanilamide there was no pustular eruption except in case 6, in which three pustules occurred. In the cases in which sulfanilamide was not used there was the typical eruption of smallpox. Sulfanilamide seemed to abort the second phase of smallpox with its pustulation and scarring; there were some macular spots on all those receiving sulfanilamide, but they were evanescent. As far as morbidity goes, the patients who received sulfanilamide recovered immediately after the subsidence of fever and the symptoms of the initial phase. The effect of sulfanilamide in patients with the typical eruption already present is not known, since the patients who received sulfanilamide were started on the treatment before an eruption appeared.

The occurrence of these seven cases in the same community and mostly in the same family during an outbreak of smallpox, and the absence of an eruption in those who received sulfanilamide therapy does not seem to be coincidental.

SUMMARY

1. Three of the seven patients with smallpox were treated symptomatically and in all three the typical eruption of smallpox developed.

2. The remaining four patients were given sulfanilamide, and in three there was only an evanescent macular eruption which rapidly disappeared; in the remaining case there were only three pustules.

3. The patients who were given sulfanilamide were back at work about a week sooner than those who did not receive it.

4. Sulfanilamide seems to have a beneficial effect in the treatment of smallpox when administered early in the disease.

INTERSEXUALITY

ROBERT C. MOEHLIG, M.D., AND NORMAN M. ALLEN, M.D.
DETROIT

Intersexuality is an interesting phenomenon and cases of this type are not frequently encountered. In his book on genital abnormalities Young¹ has given a complete review of the subject and has presented cases of his own.

REPORT OF CASE

The following case is of interest:

E. Z., a student aged 12 years, was seen Sept. 26, 1932, by the late Dr. Max Ballin, having been referred by the Childrens' Center of Detroit because of abnormal sexual development.

At the time of the birth of the patient, the mother was told that there was some abnormality of the sex organs but that the baby's sex was female. The child was christened Ida and was reared as a girl. At the age of 10 a school nurse discovered that there was some abnormality of the sex organs but did not report the condition until the child was ready to enter high school at the age of 12. There had been no menstruation, either normal or vicarious. There was nothing significant in the past history.

The father is Polish and the mother is Lithuanian; both are living and are of average build.

The patient was well built and well nourished, of stocky type, with a height of 61½ inches (156 cm.), weighing 116 pounds (52.6 Kg.), with dark complexion and dark brown hair (fig. 1). The patient had a deep voice like a young man of 16 or 17. There was some hair on the upper lip. The breasts were of the flat male type. There was a female type of distribution of pubic hair. The penis was somewhat smaller than normal, hook shaped with chordee. Hypospadias of the scrotum, urethra and prepuce was present. The scrotal halves were fairly well developed and split in the middle and did not contain testicles (fig. 2).

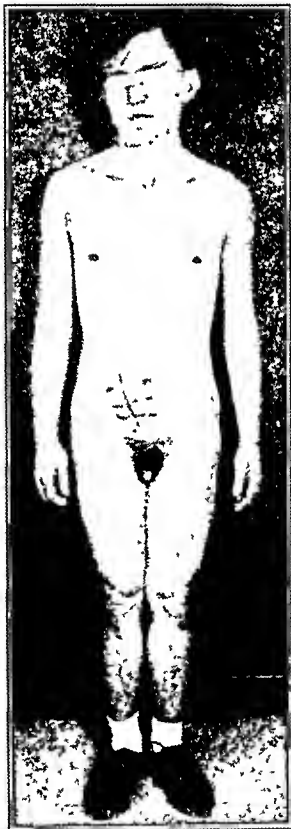


Fig. 1.—Appearance of patient June 15, 1938. Note the short, stocky build with female distribution of pubic hair.

There was a rudimentary vagina 6 cm. in length and about 1 cm. below the penis (fig. 3). A well developed prostate could be felt by rectal examination. Physical examination was otherwise negative.

Laboratory examination revealed that the blood, urine and chemistry of the blood were normal; the Wassermann reaction was negative. The blood pressure was 110 systolic, 72 diastolic. The basal metabolism was plus 10 per cent.

X-ray examination of the skull was essentially negative; that of the chest and urinary tract was also negative. There was no suggestion of an adrenal tumor.

It was decided that the patient was of the male sex and he was therefore rechristened Eugene, he was sent away for two weeks, his hair was cut so that it conformed to the masculine type and he donned long trousers.

Beginning Dec. 22, 1932, Dr. Ballin performed a series of corrective plastic operations. In the first stage the chordee was corrected; a constricting band between the corpora cavernosa

was excised which permitted straightening of the penis. Jan. 17, 1933, a plastic operation on the glandular part of the urethra was performed, and June 24 the fistula which had formed posterior to the glans was operated on. June 5, 1934, an anterior urethra was constructed from the skin flaps of the posterior aspect of the penis. This urethra was constructed over a rubber catheter but was not connected to the original



Fig. 2.—Showing scrotal halves with vaginal opening

orifice of the bladder. Sounds were passed at periodic intervals every two or three weeks up to the present. His condition has been very satisfactory with this series of operations except for the fact that cystitis has persisted.

April 27, 1938, an acute appendicitis developed and on April 28 an acutely inflamed appendix was removed by one of us (Dr. Allen). The remainder of the abdomen was carefully examined and a small uterus was found with bilateral tubes and normally developed ovaries with the fimbriated ends of the tubes found patent. No rudimentary testicles were found. He made an uneventful recovery.

Gonadotropic assay of the urine was attempted several times but, because of bacterial infection present in the urine, all animals used in the tests died.

As he had reached the age of 18, a discussion with the patient concerning his psychosexual aspect was undertaken. He stated that he has always liked girls and for the last two years has had erections. He has had frequent orgasms with emissions, the discharge coming through the perineal urethra. Several specimens of this discharge were collected but no spermatozoa were found, nor were there any spermatozoa in the urine collected immediately after the discharge. He masturbated quite frequently and became sexually excited very easily. He expressed a desire to marry in the future but felt embarrassed because he had to sit down to urinate. This was his only complaint. He shaved once a week, for there was but a sparse growth of hair present on his face, being more like the "down of youth."

He was rather quiet in his speech, the voice being deeply masculine. He was of a retiring nature and it was difficult to have him discuss his case freely; he cooperated well in the examinations.

COMMENT

This patient would fall in the group termed by Klebs² as pseudohermaphroditismus masculinus internus. In this group, in addition to male sex organs, tubes, uterus and vagina have

2. Klebs, cited by Young.¹

From the Department of Medicine, Harper Hospital and Wayne University, and the Department of Surgery, Harper Hospital.
1. Young, Hugh: Genital Abnormalities, Hermaphroditism and Related Adrenal Diseases, Baltimore, Williams & Wilkins Company, 1937.

also developed. According to Creevy,³ one can classify any pseudohermaphrodite by the use of two adjectives: The first (masculine or feminine) indicates the nature of the sex gland. The second (external or internal, complete) indicates whether it is the sex of the internal or of the external or of both groups of genitalia that differs from that of the gonad.

Rubovits and Saphir,⁴ in reporting their case of intersexuality, say: "Our microscopic evidence of testicular tubular atrophy and absence of spermatogenesis is enough to rule out the diagnosis of true hermaphroditism and to confirm again the fact that true hermaphroditism never has been found in man." Young,¹ on the other hand, states that his is the ninth accepted case of hermaphroditismus versus on record.

Psychically the patient considered himself as belonging to the male sex and was fond of the females. He says that he "feels mixed up" because he was reared as a girl and was "changed over." He has desires for intercourse with females, has erections and a discharge no doubt prostatic in origin, since no spermatozoa were ever found in the discharge or in the urine passed immediately after the discharge. No trace of a testicle could be found at operation.

His build is distinctly masculine, as shown in figure 1. His voice is deeply masculine and was present at the age of 12, indicating a well developed cartilaginous larynx. He is only 63 inches (160 cm.) in height, showing that the union and



Fig 3—Forceps in vaginal opening.

ossification of the epiphyses took place prematurely. His appearance is very much like that seen in achondroplastic dwarfs with short muscular arms and legs.

SUMMARY

The case of intersexuality here reported is classified according to the Klebs grouping as pseudohermaphroditismus masculinus internus. In this group the male individual has also tubes, a uterus and a vagina. Our patient had, in addition, well developed ovaries. No testicles were seen or palpated.

The prostate was well developed. The patient had been reared as a girl until the age of 12 years, when he was rechrist-

ened with a masculine name and has since lived as a male. His sexual inclination is toward the female sex. He has erections and orgasms with a prostatic discharge through a perineal urethra. Micturition can be accomplished only in the sitting position.

964 Fisher Building.

DEATH FROM GRANULOCYTOPENIA AFTER SULFANILAMIDE THERAPY

PHILIP CORR, M.D., AND RALPH N. ROOT, M.D., RIVERSIDE, CALIF.

Sulfanilamide is such a valuable drug that it is being used very widely and with perhaps some lack of caution. For this reason it seems wise to report another fatal case to the small series of severe granulocytopenias resulting presumably from its use.

REPORT OF CASE

Mrs. M. S., white, American, aged 22, entered the Riverside County Hospital Sept. 19, 1938, because of a severe throat infection of about two weeks' duration. There had been a high fever with vomiting for two days. At the time of entrance into the hospital there was no other relevant history.

On physical examination at that time the patient was well developed and well nourished and appeared acutely ill. The temperature was 104.6 F., the pulse 136 and the respiratory rate 28. A general physical examination was done, examination of the vagina and rectum being omitted; the following observations were made: There were several superficial ulcerated areas about the lips. A few white patches were noted on the gums. The breath was foul. The tonsils were moderately enlarged and covered with a grayish, necrotic membrane. No bleeding was noted on traumatization of the membrane. The pharynx was injected. There was a mild anterior cervical adenitis bilaterally. On the posterior surface of the left hand between the first and second fingers was a small linear abrasion, surrounded by a small area of inflammation.

A smear from the throat revealed many diphtheria-like organisms. On the basis of this report 65,000 units of diphtheria antitoxin was given promptly. The following day culture of material from the throat was negative for diphtheria and the smear was reported negative for diphtheria. Numerous fusiform bacilli with a few spirilla were noted.

On the day of entrance the laboratory reported the hemoglobin content to be 68 per cent, with 3,120,000 red blood cells, 800 white blood cells with 8 per cent polymorphonuclear neutrophils, 2 per cent eosinophils and 90 per cent lymphocytes. The condition was then recognized as agranulocytic angina. Pent-nucleotide was given intramuscularly in four doses of 10 cc. between meals on September 20 and 21. A transfusion of 550 cc. of whole citrated blood was given September 21.

September 20, the day after admission to the hospital, the white blood cell count improved to 1,100 per cubic centimeter with 48 per cent lymphocytes and 52 per cent polymorphonuclear neutrophils. The following day, the day of the patient's death, the white blood cell count was 2,000 with 56 per cent lymphocytes and 44 per cent neutrophils.

The patient's temperature remained around 103.6 to 105 F. until two days after her entrance into the hospital, when it gradually rose to 107.8 (rectal) before death. She was delirious much of the time the last day. At the time of death the small inflammatory lesion of the left hand amounted to a cellulitis involving most of the left hand posteriorly.

After repeated questioning by both of us the patient finally admitted, on the day of her death, that she had taken some tablets for leukorrhea. After this admission it was found that on Aug. 27, 1938, she had taken 80 grains (5 Gm.) of sulfanilamide, repeating this dose the following day. She then took 40 grains (2.6 Gm.) a day for six days and then 20 grains (1.3 Gm.) a day for seven days, the last tablets being taken September 11, eight days before she entered the hospital. Altogether 540 grains (35 Gm.) was given in a period of fifteen days by an osteopathic physician. No check was made of the blood count until entrance into the hospital, and no mention

³ Creevy, C. D.: Pseudohermaphroditism: Report of Five Cases, Internat. S. Digest 16: 193-212 (Oct.) 1933.

⁴ Rubovits, W. H., and Saphir, William: Intersexuality, J. A. M. A. 110: 1823-1826 (May 28) 1938.

was made by this practitioner of the medicine given when he sent the patient to the county hospital as probably having diphtheria.

The Kahn test was strongly positive, the report being made the day after the patient's death. A blood culture was negative after ten days' incubation. The urinalysis on entrance revealed a heavy trace of albumin, with a negative sugar reaction, from 6 to 8 white blood cells per high power field, and a markedly positive acetone reaction.

Autopsy was done by one of us (R. R.) on the embalmed body sixteen hours after death. There was a soft, nonpitting swelling of the dorsum of the left hand. There was an abrasion between the first and second fingers of the left hand with considerable dark bluish discoloration in that region. There was moderate swelling of the neck with palpable lymph nodes bilaterally. No other lymphadenopathy was noted.

When the pleural cavity was opened no free fluid was encountered, and no adhesions were noted. The pleurae showed evidence of some inflammation. There were several dark purplish hemorrhagic areas seen on the surface of the lungs, most marked in the right upper lobe. These were from 1 to 5 cm. in diameter and on cut section appeared dry, rough and raised. They were not limited to the surface and were not wedge shaped. There was some evidence of necrosis present in the centers. Otherwise the lungs were essentially normal. The pericardium was markedly injected and there were several small hemorrhagic areas. No abnormal amount of fluid was seen in the pericardial sac. The heart was not enlarged. The heart muscle was firm and of good tone, while its chambers, valves and vessels showed no abnormalities.

No free fluid was found in the abdominal cavity. The peritoneum was white and glistening. No adhesions were present. The liver appeared congested and there was a small dark area noted on the anterior surface of the right lobe which was soft and necrotic on cut section, but no free pus was present. The spleen was soft and moderately enlarged and had a smooth capsule. There was no evidence of abscess or of infarction. The stomach was dilated but essentially normal. The small and large intestine showed no abnormalities. The kidneys were moderately enlarged. Thin capsules stripped with ease, revealing congested surfaces. The parenchyma was poorly outlined. There was no dilatation of the ureters. No inflammation of the bladder was noted. The tubes and surrounding tissues were markedly congested and thickened, but no exudate was present. The ovaries were essentially normal. The uterus was small.

Sections of tissue from various organs were removed and examined by Dr. Oran I. Cutler of Loma Linda. His report showed the following:

Microscopic Examination.—The wall of the fallopian tube was congested but there was practically no scarring and no leukocytic infiltration was present. There was edema of the lung, and fairly numerous heart disease cells were present. In one section there were many masses of bacteria but no leukocytic reaction. In the ovaries there were some cysts lined with tiny dark cells. The kidney showed no definite pathologic changes. The pulp of the spleen was loose and relatively acellular. The liver showed some cloudy swelling.

The final diagnosis was agranulocytic angina caused presumably by sulfanilamide.

There was serologic evidence of syphilis.

COMMENT

Nine deaths have previously been recorded in the literature from agranulocytosis apparently caused by sulfanilamide according to a compilation by Kracke¹ in October 1938. A few more cases have been recorded in which recovery has taken place. Many more have probably occurred—some unrecognized, some unreported. With the increasing use of this valuable drug, more cases may be expected.

It is assumed that the drug, added to some unknown factor, produces a maturation arrest of the granulopoietic tissues.

There should be some simple means of avoiding this grave complication. One suggestion is commonly made² to have

repeated frequent blood counts. This is an excellent suggestion and should be given serious consideration. However, if followed rigidly and as a routine by all those giving sulfanilamide it would probably cost many more lives by restriction of the use of sulfanilamide than it would save by prevention of agranulocytic deaths, which are apparently very rare. In the case of agranulocytosis from aminopyrine, it is relatively easy to solve the problem by substituting some other similar drug. As yet we have not found a comparatively effective, relatively harmless substitute for sulfanilamide.

Even with frequent blood counts it has not been proved that this will prevent deaths from agranulocytosis. In Young's³ case examination of the blood five days before death failed to reveal an impending granulocytopenia, although the white blood count was reduced from 12,000 to 7,800. The granulocytopenia developed in this case four days after the sulfanilamide was discontinued.

A second suggestion has been made which should receive serious consideration, i. e. that any patient having toxic symptoms of any nature should (1) be denied further use of the drug or (2) should be watched very closely. This would seem to be an excellent rule to follow. Further use of the drug should be denied if the condition being treated is not of major seriousness, and the policy of strict observation should be enforced with blood counts every other day if sulfanilamide therapy is urgent.

A third point in preventing agranulocytic complications might be made concerning the dosage. In an adult the smallest dose of sulfanilamide given preceding the onset of agranulocytosis was 25 Gm., and in that case it was probable that the patient had taken more. In practically all the other cases reported 35 Gm. or more had been ingested in a period of two weeks or more. With our present information we might say that the general practitioner might safely give up to 20 Gm. of sulfanilamide before being concerned about agranulocytosis. That dosage may well care for many of the simpler infections treated with this drug.

This case further substantiates the causal relationship between sulfanilamide therapy and agranulocytosis.

NICOTINE POISONING WITH A SALT OF NICOTINE

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LOS ANGELES

The reported instances of fatal nicotine poisoning according to Webster¹ and to Beeman and Hunter² are relatively infrequent. The nicotine insecticides are the usual preparations of nicotine used for suicidal purposes. To our knowledge there have been no reports of poisoning with a dry salt of nicotine.

The case reported here was one of suicide which came to the Los Angeles County coroner. The autopsy revealed no evident cause of death. The viscera were therefore sent to the county chemist for analysis.

Following the usual routine for extracting alkaloids there was left, after evaporation of the alkaline ether extract of the stomach contents, a considerable quantity of white crystalline material. This white residue was purified and proved to be nicotine by the mercury bichloride and gold chloride microchemical tests and this was confirmed by biologic tests on frogs. Chemical examination showed that the nicotine salt was not the sulfate or hydrochloride but the tartrate. Later crystals of nicotine tartrate were identified in some cigarettes found among the effects of the deceased. As the patient was a pharmaceutical chemist and had access to the salts of nicotine, one may readily understand how such a little used salt of nicotine was employed in this instance.

3. Young, C. J.: Agranulocytosis and Para-Amino-Benzene-Sulfanilamide, *Brit. M. J.* 2: 105 (July 17) 1937.

Dr. Wagner is autopsy surgeon, Los Angeles County; Dr. Drake is assistant to the county chemist.

1. Webster, R. W.: Legal, Medicine and Toxicology, Philadelphia, W. B. Saunders Company, 1930, p. 618.

2. Beeman, J. A., and Hunter, W. C.: Fatal Nicotine Poisoning, *Arch. Path.* 24: 481 (Oct.) 1937.

1. Kracke, R. R.: Relation of Drug Therapy to Neutropenic States, *J. A. M. A.* 111: 1255-1259 (Oct. 1) 1938.
2. Sulfanilamide and the Blood, editorial, *Ann. Int. Med.* 12: 725 (Nov.) 1938.

Special Article

TYPHOID IN THE LARGE CITIES OF THE UNITED STATES IN 1938

TWENTY-SEVENTH ANNUAL REPORT

The means employed for obtaining data for this report were described last year. A communication was addressed to the health officer of each of the ninety-three cities, requesting the number of deaths from typhoid both among residents and among nonresidents which were recorded for 1938. The difficulty of obtain-

TABLE 1.—*Death Rates of Fourteen Cities in New England States from Typhoid per Hundred Thousand of Population*

	1938	1937	1936	1911 1935	1921- 1930	1921- 1925	1916 1920	1911 1915	1906 1910
Bridgeport	0 0	0 0	0 0	0 3	0 5	2 2	4 8	5 0	10 3
Fall River	0 0	0 0	0 9	0 2*	2 2	2 3	5 5	13 1	13 5
Lynn	0 0	0 0	1 0	0 2	1 5	1 6	3 9	7 2	14 1
New Bedford	0 0	0 0	1 8	1 1*	1 5	1 7	6 0	15 0	16 1
Providence	0 0	0 4	0 8	1 1	1 3	1 8	3 8	8 7	21 5
Cambridge	0 0	0 8	0 0	0 9	2 1	4 3	2 5	4 0	9 6
Lowell	0 0	1 0	1 0	1 0*	2 6	2 4	5 2	10 2	13 9
Worcester	0 5*	0 5*	0 0	0 0	1 0	2 3	3 5	5 0	11 9
Hartford	0 3*	1 1	0 5	1 2	1 3	2 5	6 0	15 0	19 0
Boston	0 6†	0 4*	0 1*	0 0	1 2	2 2	2 5	9 0	16 0
Springfield	0 7*	0 7*	0 0	1 0	0 4	2 0	4 4	17 6	19 9
Waterbury	0 0	0 0	0 0	0 4	1 2	1 0	8 0	18 8	
Somerville	1 0	0 0	0 0	0 4	1 3	1 6	2 8	7 9	12 1
New Haven	1 2†	1 2	1 2	0 7	0 6	4 4	6 8	18 2	20 8

* All typhoid deaths were stated to be in nonresidents.

* Rate computed from population as of April 1, 1930, as no estimate for July 1, 1933, was made by the Census Bureau.

† One third or more of the reported typhoid deaths were stated to be in nonresidents.

ing an adequate estimate of population continues and will harass the public health official until the 1940 census has been completed. In all instances the local estimate when furnished by the health officer has been used. There are some who feel that their cities have grown slightly during the past years and others take credit for a decrease in population. Study indicates that in no instance is a grave statistical error committed by using the local estimate rather than falling back on the 1930 census figures. It is hoped that after the 1940 figures become available these tables can be revised, but even then it is anticipated that the corrections will be of only a minor character.

Paratyphoid has again been excluded. In tables 1 to 8 inclusive (as well as in table 10) a special note has been made of cities in which all deaths occur among nonresidents. Similar notation has been added for the death rates for 1936 and 1937 but in no instance for preceding years. Another symbol has been used to indicate those cities in which more than one third of the reported deaths were stated to have been among nonresidents.

Special attention is called to the cities listed in table 9 which report no typhoid death during the past two years. Bridgeport reports no death in five years, Fort Wayne no death in four years, South Bend and Utica no death in three years. Attention is also directed to the seven cities (Toledo, Hartford, Syracuse, Worcester, Springfield, Evansville and Camden) which are

placed among those of first rank rather than on the honor roll in table 10 merely because they have been charged with deaths among nonresidents. It is quite appropriate to think of these cities as belonging in the honor group. Local circumstances beyond the control of the public health officer frequently require the hospitalization in large cities of cases which belong in the surrounding rural communities. This same comment applies to those cities in which a relatively high share of the typhoid deaths occurred among nonresidents.

Seven of the large New England cities report no death from typhoid in 1938 (table 1). Only four of these cities (Bridgeport, Fall River, Lynn, New Bedford) were in this same honor group in 1937. Bridgeport has extended its good record to five years. Somerville, which last year recorded no death for four years in succession, reports one death among residents in 1938. Springfield, after passing through a period of three successive years with no death among residents, reports one death among nonresidents in 1938. Providence reports no death in 1938 among twelve resident patients. Three of these cases occurred in one family and are attributed to the fact that children were playing near an old privy. Of two deaths reported from New Haven, one occurred in a nonresident. Of five deaths reported from Boston, three were among nonresidents. Hartford, with but one death and that in a nonresident, reports that in 1936, during the Connecticut River flood, 97,334 typhoid inoculations were given and that during the 1938 flood 4,435 such protective treatments were administered to Hartford residents. The New England cities as a whole (population 2,645,438), although reporting a rate as low as that for 1937, have lost first place among the grouped cities (table 13).

TABLE 2.—*Death Rates of Eighteen Cities in Middle Atlantic States from Typhoid per Hundred Thousand of Population*

	1938	1937	1936	1931 1935	1923- 1930	1921- 1925	1916 1920	1911- 1915	1906 1910
Utica	0 0	0 0	0 0	0 6	1 1	3 4*			
Reading	0 0	0 0	1 8	0 4	1 6	6 0	10 0	31 9	42 0
Buffalo	0 0	0 2*	0 3	0 6	2 7	3 9	8 1	15 4	22 8
Seranton	0 0†	0 7*	0 6†	1 4	1 8	2 4	3 8	9 3	31 5
Erie	0 0	0 8*	0 8*	1 0	0 9	2 3	6 9	40 0	46 6
Lizaboth	0 0	0 8	0 8	0 9	1 6	2 4	3 3	8 0	16 6
Rochester	0 3	0 0	0 6†	0 4	1 7	2 1	2 9	9 6	12 8
New York	0 3	0 3	0 4	0 8	1 3	2 6	3 2	8 0	13 5
Newark	0 4	0 0	0 2	0 3	0 9	2 3	3 3	6 5	14 6
Syracuse	0 5*	0 0	0 0	0 8	0 8	2 3	7 7	12 3	15 6
Paterson	0 7	0 0	0 7	0 9	1 0	3 3	4 1	9 1	19 3
Yonkers	0 7	0 0	0 7†	0 7	0 5	1 7	4 8	5 0	10 3
Philadelphia	0 7†	1 4	0 7	0 9	1 1	2 2	4 9	11 2	41 7
Jersey City	0 9	0 3	0 6*	0 2	0 9	2 7	4 5	7 2	12 6
Pittsburgh	0 9†	0 7†	0 7†	0 9	2 4	3 9	7 7	15 9	65 0
Albany	1 4	1 3†	1 5	1 1	3 8	5 6	8 0	18 6	17 4
Camden	1 6*	1 6	0 8	2 8	4 4	5 9	4 9	4 5	4 0
Trenton	2 4†	0 5*	0 8*	1 1	2 1	8 2	8 6	22 3	28 1

* All typhoid deaths were stated to be in nonresidents.

† One third or more of the reported typhoid deaths were stated to be in nonresidents.

* Incomplete data.

* Typhoid deaths furnished by Pennsylvania Department of Health, Harrisburg.

* Rate computed from 1930 census population, as no local estimate was given.

† Corrected rate. In review for 1936, Yonkers reported cases instead of deaths.

The lowest rate, of 0.35, is reported from the East North Central states, while second place goes to the West North Central cities and third place to the Middle Atlantic cities. In the New England cities there were recorded twelve deaths in 1938, a number identical with that of 1937.

The Middle Atlantic states have a group rate (0.44) which is significantly lower than that of 1937 (0.51). The 1938 rate is slightly below that of the New England

The preceding articles in this series were published in THE JOURNAL May 31, 1913, p. 1702; May 9, 1914, p. 1473; April 17, 1915, p. 1322; April 22, 1916, p. 1305; March 17, 1917, p. 845; March 16, 1918, p. 777; April 5, 1919, p. 997; March 6, 1920, p. 672; March 26, 1921, p. 860; March 25, 1922, p. 890; March 10, 1923, p. 691; Feb. 2, 1924, p. 389; March 14, 1925, p. 813; March 27, 1926, p. 948; April 9, 1927, p. 1148; May 19, 1928, p. 1624; May 18, 1929, p. 1674; May 17, 1930, p. 1574; May 9, 1931, p. 1576; April 30, 1932, p. 1550; May 13, 1933, p. 1491; May 19, 1934, p. 1677; June 8, 1935, p. 2093; June 6, 1936, p. 1983; June 19, 1937, p. 2118; and July 30, 1938, p. 414.

cities and is nearly half the rate of the Middle Atlantic cities for the quinquennial period 1931-1935 (0.80). There has been no death recorded in Utica for the past three years. Syracuse continued to hold her place of honor in that there was recorded no death among

TABLE 3—*Death Rates of Nine Cities in South Atlantic States from Typhoid per Hundred Thousand of Population*

	1935	1937	1936	1931 1935	1925 1930	1921- 1925	1916 1920	1911 1915	1906 1910
Norfolk	0.8	0.8	0.0	4.2	2.2	2.8	8.8	21.7	42.1
Atlanta	0.9†	1.9†	3.2†	7.2	11.1	14.5	14.2	31.4	38.4
Washington	1.0†	1.9	1.6	2.6	2.8	5.4	0.5	17.2	36.7
Baltimore	1.5†	1.2	0.9	1.4	3.2	4.0	11.8	23.7	35.1
Tampa	2.0†	0.0	0.0	3.0	3.8	19.1	43.0#		
Wilmington	2.7	1.8	0.0	1.5	3.1	4.7	25.4#	23.2#	3.0
Richmond	2.7†	3.2†	2.7	2.5	1.9	5.7	9.7	15.7	21.0
Miami	3.6†	6.3	3.1†	2.2	3.5				
Jacksonville	5.2	4.0	1.3	1.7	4.4				

Incomplete data
† One third or more of the reported typhoid deaths were stated to be in nonresidents.

residents in 1938, but the record of this city has been somewhat embarrassed by the occurrence of one typhoid death among nonresidents in 1938. Six cities in this group report no typhoid death in 1938. There were seven such cities in 1937. Utica and Reading are the only two cities reporting no death in each of these two years. Buffalo, Scranton, Erie and Syracuse record no death among residents during the past two years. Scranton, as in the case of Springfield, has passed through five consecutive years with no death among residents. Paterson, with no death in 1937, records one death among residents in 1938. Newark, with no death in 1937, reports two among residents in 1938. New York reports twenty-two deaths, of which twenty were among residents. Pittsburgh reports six deaths, three among residents. Philadelphia reports fifteen deaths, all among residents. In the group as a whole (population

TABLE 4—*Death Rates of Eighteen Cities in East North Central States from Typhoid per Hundred Thousand of Population*

	1935	1937	1936	1931 1935	1925 1930	1921- 1925	1916 1920	1911 1915	1906 1910
Fort Wayne	0.0	0.0	0.0	2.2	4.2	12.9	7.3		
South Bend	0.0	0.0	0.0	0.7					
Milwaukee	0.0	0.0	0.3	0.2	0.8	1.6	6.5	13.6	27.0
Canton	0.0	0.0	1.0*	0.9	1.4	3.3	8.9		
Grand Rapids	0.0	1.0*	0.6*	0.2	1.0	1.9	9.1	25.5	29.7
Youngstown	0.0	1.1	1.1†	1.1	1.1	7.2	19.2	29.5	35.1
Peoria	0.0	1.7*	1.7*	0.9	0.2	3.7	5.7	16.4	15.7#
Detroit	0.2†	0.3	0.5	0.6	1.3	4.1	8.1	15.4	22.5
Chicago	0.3	0.3	0.3	0.4	0.6	1.4	2.4	8.2	13.8
Cleveland	0.3†	0.5	1.0	1.1	1.0	2.0	4.0	10.0	17.7
Toledo	0.3*	1.2*	1.0†	1.3	3.0	5.8	10.6	14.4	31.5
Columbus	0.3	1.5	3.7*	2.0	2.1	9.5	7.1	15.8	40.0
Akron	0.4	1.6†	0.8†	0.8	1.5	2.4	10.6	21.0	27.1#
Cincinnati	0.6	1.3†	1.9†	1.4	2.5	3.2	3.4	7.8	30.1
Evansville	0.9*	2.7†	0.0	1.9	6.2	5.0	17.5	32.0	35.0
Flint	1.2	3.0†	1.2	0.7	1.6	4.6	12.7	18.8	46.9
Indianapolis	1.3	1.8	0.8†	1.2	2.7	4.6	10.3	20.5	30.4
Dayton	1.3†	1.4†	1.8†	0.8	1.9	3.3	9.5	14.8	22.5

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
Incomplete data
Rate computed from 1930 census population, as no local estimate was given.

13,469,996) there were fifty-nine deaths in 1938 compared with sixty-eight in the preceding year. There are two geographic areas which have a lower death rate for 1938, the East North Central and the West North Central.

The rate for the South Atlantic cities (1.74) is much improved over that of 1937 (1.96) but is not as low as that of 1936 (1.55). In these cities (population

2,638,626) there occurred forty-six deaths in 1938 and fifty-one in 1937. There was no city without a death in 1938, although six of the nine cities in this group report that one third or more of the deaths occurred among nonresidents. Baltimore reports thirteen deaths, eight among residents. It is reported that, in investigating sources of infection in typhoid cases, there were located sixteen carriers presumably responsible for twenty cases. Many cities in the South continue to be embarrassed by the high percentage of deaths among nonresidents. The large cities serve as hospital centers for the neighboring suburban and rural areas which are without adequate means of caring for the communicable diseases and which frequently suffer from the want of whole-time local public health supervision. Of five deaths recorded for Richmond, four were

TABLE 5—*Death Rates of Six Cities in East South Central States from Typhoid per Hundred Thousand of Population*

	1935	1937	1936	1931 1935	1925 1930	1921- 1925	1916 1920	1911 1915	1906 1910
Louisville	0.8†	0.6*	1.4†	2.3	3.7	4.0	9.7	19.7	53.7
Birmingham	1.7†	1.4	5.0*	8.9	8.0	10.8	31.5	41.3	41.7
Chattanooga	1.7	1.7	0.0	4.7	8.0	18.6	27.2	35.2#	
Memphis	3.1†	4.9†	4.7†	7.9	9.8	18.9	5.7	42.0	35.3
Knoxville	3.9	3.2	4.1	5.7	10.7	20.8	25.3#		
Nashville	4.9†	1.2*	4.4†	5.6	18.2	17.8	20.7	40.2	61.2

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
Incomplete data
Rate computed from 1930 census population, as no local estimate was given.

TABLE 6—*Death Rates of Nine Cities in West North Central States from Typhoid per Hundred Thousand of Population*

	1935	1937	1936	1931 1935	1925 1930	1921- 1925	1916 1920	1911 1915	1906 1910
Wichita	0.0	0.0	1.9	0.7	1.2	6.3			
Minneapolis	0.0	0.2*	0.0	0.8	0.8	1.9	5.0	10.6	32.1
Kansas City, Kan.	0.0	0.8*	2.3	1.1	1.7	5.0	9.4	21.1	74.5#
Omaha	0.0	1.3	0.9*	0.9	1.3	3.3	5.7	14.9	40.7
St. Louis	0.5	1.1†	0.8	1.6	2.1	3.9	6.5	12.1	14.7
St. Paul	0.7	0.0	0.7	0.7	1.4	3.4	3.1	9.2	12.8
Des Moines	0.7	0.7	2.8	2.1	2.4	2.2	6.4	15.9	23.7
Kansas City, Mo.	0.7†	1.4†	0.3	1.5	2.6	5.7	10.6	16.2	35.6
Duluth	1.0	0.0	0.0	1.0	1.1	1.7	4.4	19.8	45.5

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
Incomplete data

among nonresidents; of six in Washington, two were among nonresidents. Three deaths among nonresidents are included among the five deaths reported for Miami. It is stated that for one nonresident death the infection was contracted prior to the arrival of the patient in Florida. Miami originally reported eight deaths for the year 1937. The director of health states that this should now be changed to six deaths for that year. Of eight deaths recorded by Jacksonville, but one occurred in a nonresident. The health department reports that a plan is being developed to require vaccination of all food handlers against typhoid. This city continues to serve as a medical center for seven or eight nearby rural counties with no public health units. Such a unit has, however, recently been established in Duval County, which includes the territory immediately surrounding Jacksonville. After two consecutive years with no typhoid death, Tampa records one death among residents for two reported in 1938.

The East North Central cities (population 9,907,440) can boast of the best record for 1938 (rate 0.35). In 1937 there were sixty-one deaths reported from these

cities. In 1938 the number of deaths had dropped to thirty-five. There are seven cities which report no death and two additional cities (Toledo, Evansville) which record no death among residents. In addition to this there are three cities (Detroit, Cleveland, Dayton) in which one third or more of the reported cases were stated to be in nonresidents. Fort Wayne reports no typhoid death in four years, South Bend no death in three years, Milwaukee and Canton no death in two years. There has been no death among residents in Grand Rapids and Peoria during the past four years. Toledo reports no resident death in two years. Dayton records a significantly high proportion of deaths among nonresidents during each of the past three years. Of three deaths each in Cleveland and Detroit, one in each

residents, with a comment that in both instances the source of infection was outside the city. Special mention of the influence of the surrounding rural area and the Negro population to the death rate for Memphis was made in our report a year ago.

TABLE 9.—Thirteen Cities with No Typhoid Death in 1937 and 1938

Bridgeport* Canton Fall River Fort Wayne**	Lynn Milwaukee New Bedford Reading Seattle	South Bend† Tacoma Utica† Wichita
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* No typhoid death in five years.
** No typhoid death in four years.
† No typhoid death in three years.

TABLE 7.—Death Rates of Eight Cities in West South Central States from Typhoid per Hundred Thousand of Population

	1935	1937	1936	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Tulsa.....	0.6	0.0	0.7†	1.1	8.3	16.3#	...	...	...
Oklahoma City....	1.3	3.1	4.3†	4.3	7.4#	...	...	...	...
San Antonio.....	2.3†	3.8	2.7	4.2	4.6	0.3	23.3	29.5	35.9
Fort Worth.....	2.7†	2.2	3.3	4.6	5.9	6.1	16.3#	11.9	27.8
Houston.....	3.1	2.0	3.8	3.2	4.8	7.6	14.2	35.1	49.5#
Dallas.....	4.3†	3.0*	1.5*	5.4	7.3	11.2	17.2	...	...
New Orleans.....	5.5†	2.3†	6.5†	9.6	9.9	11.6	17.5	20.9	35.6
El Paso.....	5.9	0.0	6.8†	4.9	9.1	10.8	30.7	42.8	...

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
Incomplete data.
† Rate computed from 1930 census population, as no local estimate was given.

TABLE 8.—Death Rates of Eleven Cities in Mountain and Pacific States from Typhoid per Hundred Thousand of Population

	1935	1937	1936	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Seattle.....	0.0	0.0	0.5	0.6	2.2	2.6	2.9	5.7	25.2
Tacoma.....	0.0	0.0	0.9	0.7	1.8	3.7	2.9	10.4	19.0
Portland.....	0.0	0.3	0.6	0.8	2.3	3.5	4.5	10.6	23.2
Salt Lake City....	0.0	0.7	0.0	1.0	1.9	6.0	9.3	13.2	41.1
San Diego.....	0.0	1.6†	1.8†	1.3	1.0	1.6	7.9	17.0	10.5
Long Beach.....	0.6	0.0	0.8*	0.2	1.1	2.1#	...	...	...
Oakland.....	0.6†	0.3	0.3	1.0	1.2	2.0	3.8	8.7	21.5
Los Angeles.....	0.6†	0.7†	1.0†	0.8	1.5	3.0	3.6	10.7	19.0
San Francisco.....	0.7	0.6	0.3†	0.8	2.0	2.8	4.6	13.6	26.3
Denver.....	1.0	2.7	2.0	1.8	2.6	5.1	5.8	12.0	37.5
Spokane.....	2.4†	0.0	0.8	1.4	2.2	4.4	4.9	17.1	50.3

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
Incomplete data.

city was of a nonresident. Chicago reports a total of twelve deaths, two of which were stated to be in nonresidents.

The six cities in the East South Central Group show an increase in the death rate (2.10 in 1937, 2.36 in 1938). This rate, however, is considerably below that of 1936 (3.35) and that of the quinquennial period 1931-1935 (4.81). The actual number of deaths in these six cities increased from twenty-eight in 1937 to thirty-two in 1938. No city in this group is without a death in 1938. The influence of the surrounding rural areas in contributing to the hospital load and thus to the death rate of the urban centers in the South is well illustrated by the fact that in Birmingham, Memphis and Nashville more than one third of the deaths were among nonresidents. Birmingham, with five deaths, reports two in nonresidents; Memphis, with nine deaths, records four in nonresidents; Nashville, with eight deaths, reports three in nonresidents. Chattanooga reports two deaths among

The West North Central group (population 2,785,688) reports a noteworthy reduction in the death rate (0.76 in 1937, 0.40 in 1938). There is but one group of cities (East North Central) which has a lower death rate. Four cities (Wichita, Minneapolis, Kansas City, Kan., Omaha) report no typhoid death in 1938 and the first three of these record no death among residents in 1937. Minneapolis has had no death in a resident during the past three years. Duluth, after two years with no death, now reports a single death in a resident. This death, however, is sufficient to move Duluth from the head to the bottom of the table. This is the only group in which there is no city with a death rate in

TABLE 10.—Death Rates from Typhoid in 1938

Honor Roll: No Typhoid Deaths (Twenty-Nine Cities)			
Bridgeport	Lowell	Reading	
Buffalo	Lynn	Salt Lake City	
Cambridge	Milwaukee	San Diego	
Canton	Minneapolis	Saranton	
Elizabeth	New Bedford	Seattle	
Erie	Omaha	South Bend	
Fall River	Peoria	Tacoma	
Fort Wayne	Portland	Utica	
Grand Rapids	Providence	Wichita	
Kansas City, Kan.		Youngstown	
First Rank: from 0.1 to 1.9 Deaths per Hundred Thousand (Forty-Eight Cities)			
Detroit.....	0.2†	Los Angeles.....	0.6†
Chicago.....	0.3	Oakland.....	0.6†
Cleveland.....	0.3†	Tulsa.....	0.6
Columbus.....	0.3	Des Moines.....	0.6
New York.....	0.3	Kansas City, Mo.....	0.7†
Rochester.....	0.3	Patterson.....	0.7
Toledo.....	0.3*	Philadelphia.....	0.7
Akron.....	0.4	San Francisco.....	0.7
Newark.....	0.4	Springfield.....	0.7*
Hartford.....	0.5*	St. Paul.....	0.7
St. Louis.....	0.5	Yonkers.....	0.7
Syracuse.....	0.5*	Louisville.....	0.8†
Worcester.....	0.5*	Norfolk.....	0.8
Boston.....	0.6†	Atlanta.....	0.9†
Cincinnati.....	0.6	Evansville.....	0.9*
Long Beach.....	0.6	Jersey City.....	0.9
Second Rank: from 2.0 to 4.9 (Thirteen Cities)			
Tampa.....	2.0†	Fort Worth.....	2.7†
San Antonio.....	2.3	Richmond.....	2.7†
Spokane.....	2.4†	Wilmington.....	2.7
Trenton.....	2.5†	Houston.....	3.1
		Memphis.....	3.1†
Third Rank: from 5.0 to 5.9 (Three Cities)			
Jacksonville.....			5.2
New Orleans.....			5.5†
El Paso.....			5.9

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.

excess of 1.0. Not only do these cities as a group have a low death rate but actually the lowest number of deaths. There were eleven deaths in 1938, compared with twenty-one in 1937. The Iowa State Health Department reports that no statistical correction is as yet available regarding deaths among nonresidents and consequently such information is not included in the

report for Des Moines. It is likely, however, that this same error might creep into the statistics of many other cities widely scattered throughout the United States.

The eight cities of the West South Central group did not fare so well. Here the rate increased from

TABLE 11—Number of Cities with Various Typhoid Death Rates

	No of Cities	100 and Over	50 to 99	20 to 49	10 to 19	01 to 09	00
1906-1910	77	75	2	0	0	0	0
1911-1915	79	58	19	2	0	0	0
1916-1920	84	22	32	30	0	0	0
1921-1925	89	12	17	48	12	0	0
1926-1930	92	3	10	30	37	12	0
1931-1935	93	0	6	17	28	42	0
1936	93	2	6	30	23	22	10
1937	93	2	6	23	23	22	12
1938	93	1	7	13	29	29	14
1939	93	0	7	18	19	31	16
1940	93	0	9	11	27	23	23
1941	93	0	7	15	18	29	24
1942	93	0	3	15	21	36	18
1943	93	0	1	13	26	26	27
1944	93	0	3	13	14	31	29

2.34 in 1937 to 3.52 in 1938. The actual number of deaths increased from forty-nine to seventy-four. The death rate increased in six of the eight cities, Oklahoma City and San Antonio being the only two with a lower

TABLE 12—Total Typhoid Rate for Seventy-Eight Cities 1910-1938*

	Population	Typhoid Deaths	Typhoid Death Rate per 100,000
1910	22,573,435	4,637	20.54
1911	23,211,341	3,970	17.02
1912	23,835,399	3,132	13.14
1913	24,437,989	3,285	13.43
1914	25,091,112	2,781	11.08
1915	25,713,346	2,434	9.47
1916	26,237,550	2,191	8.34
1917	26,865,408	2,016	7.50
1918	27,086,693†	1,824‡	6.73
1919	27,735,083†	1,131‡	4.15
1920	28,244,878	1,088	3.85
1921	28,859,062	1,141	3.95
1922	29,473,246	963	3.26
1923	30,087,430	950	3.16
1924	30,701,614	943	3.07
1925	31,315,598	1,079	3.44
1926	31,929,782	907	2.84
1927	32,543,966	648	1.99
1928	33,158,150	628	1.89
1929	33,772,334	537	1.59
1930	34,386,517	554	1.61
1931	35,001,705	563	1.60
1932	35,616,895	442	1.24
1933	36,232,085	423	1.18
1934	36,847,275	413	1.12
1935	37,462,465	348	0.93
1936	38,077,655	336	0.88
1937	38,692,845	280	0.72
1938	39,308,035	248	0.63

* The following fifteen cities are omitted from this table because data for the full period are not available: Canton, Chattanooga, Dallas, Fort Wayne, Jacksonville, Knoxville, Long Beach, Miami, Oklahoma City, South Bend, Tampa, Tulsa, Utica, Wichita, Wilmington.

† Data for Fort Worth lacking.

‡ The rate for ninety-three cities in 1935 was 1.63 (total population 37,437,812, typhoid deaths 755), whereas in 1930 it was 1.64, and in 1933 and 1934 it was 1.24 and 1.25, respectively. The 1931-1935 average for the ninety-three cities is 1.31.

§ Rate for ninety-three cities in 1936 was 0.96 (total population 38,249,694, typhoid deaths 365).

Rate for ninety-three cities in 1937 was 0.82 (total population 38,865,435, typhoid deaths 318).

Rate for ninety-three cities in 1938 was 0.71 (total population 39,317,556, typhoid deaths 280).

Special Note—Deaths for 1936 have been corrected, as Los Angeles originally reported seven deaths and later corrected report to one death.

death rate. El Paso, with no death in 1937, reports a rate of 5.9 (six deaths) in 1938. All but one of these deaths are among residents. Oklahoma City records no data concerning deaths among nonresidents. Of six deaths in San Antonio, four were among residents; of eleven in Houston, nine were among residents; of

twenty-nine in New Orleans, fourteen were among residents. With no death in a resident in 1936 and 1937, Dallas reports thirteen deaths for 1938, of which nine were among nonresidents.

The cities in the Mountain and Pacific states show a continued reduction in the rate (0.52 in 1938, 0.68 in 1937). There were recorded twenty-two deaths in 1938, twenty-eight deaths in 1937. In 1938 there were five cities with no death (Seattle, Tacoma, Portland, Salt Lake City, San Diego). Three additional cities (Oakland, Los Angeles, Spokane) record one third or more deaths which were in nonresidents. There was but one city with a rate in excess of 2.0 (Spokane). There were but three deaths in Spokane, two of which were among nonresidents. Two cities (Seattle, Tacoma) report no typhoid death in 1937 and 1938. Of five deaths in San Francisco, four were among residents. Of eight deaths in Los Angeles, five were among residents. Denver does not keep a record of deaths among nonresidents.

THE HONOR ROLL

The number of cities with no death from typhoid has increased to twenty-nine. In 1936 there were but eighteen such cities, in 1937 twenty-seven. Of particular significance are the data in table 9, which furnishes

TABLE 13.—Total Typhoid Death Rate per Hundred Thousand of Population for Ninety-Three Cities According to Geographic Divisions

	Population	Typhoid Deaths		Typhoid Death Rates		
		1935	1937	1935	1937	1935 1936 1937
New England	2,645,438	12	12	0.45	0.45	0.70 1.31 2.43
Middle Atlantic	13,469,096	59	68	0.44	0.51	0.80 1.40 2.77
South Atlantic	2,638,626	46	51	1.74	1.96	2.70 4.50 7.01
East North Central	9,607,440	35	61	0.35	0.63	0.75 1.24 2.34
West North Central	1,535,080	32	25	2.36	2.10	4.81 8.21 13.00
East South Central	2,755,688	11	21	0.40	0.76	1.24 1.83 3.43
West South Central	2,120,573	74	49	3.52	2.34	5.36 7.14 13.04
Mountain and Pacific	4,220,735	22	28	0.52	0.68	0.88 1.60 2.33

* Lacks data for Jacksonville and Miami.

† Data for South Bend for 1925-1929 are not available.

‡ Lacks data for Oklahoma City in 1936.

§ Lacks data for Oklahoma City.

the names of thirteen cities with no typhoid death in 1937 and 1938. Bridgeport and Fort Wayne have continued their excellent records. While last year there was but one city in the third rank (Miami), and this city would not have been included in this rank had the correct number of deaths been recorded, in 1938 we find three cities in this group, only one of which reports a significant number of deaths among nonresidents. As already stated, several of the cities in the first rank would appear in the honor roll were they not charged with deaths in nonresidents. Table 11 continues to show a swing "to the right," although the number of cities in the group having death rates from 5.0 to 9.9 has increased from one to three.

NEW LOW RECORDS ATTAINED

For the seventy-eight cities (table 12) for which complete data are available since 1910, there occurred 248 deaths from typhoid in 1938, which is the lowest of record (280 in 1937, 336 in 1936). The rate for this group of cities is for the fourth consecutive year less than 1.0. The rate for the ninety-three cities studied in 1938 is also below 1.0 (0.74) and below the corresponding rate for 1937 (0.82). This annual review again showed a downward trend in the death rate from

typhoid in the large cities of the United States. No outbreak of epidemic proportion has been recorded in these cities. Routine vaccination of the population is not practiced except under flood conditions. However, in progressive communities vaccination is urged for contacts to cases and for persons who travel widely in countries where sanitary conditions are not of the best. There seems to be a trend in some places to encourage the inoculation of foodhandlers, especially in the Southern states. The noteworthy gains for 1938 have been made in the East North Central and West North Central cities. The New England and Middle Atlantic groups have, on the whole, maintained their excellent rates of many years' standing.

Council on Physical Therapy

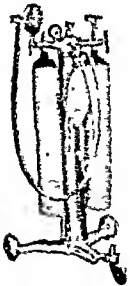
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

HOWARD A. CARTER, Secretary.

E & J RESUSCITATOR AND INHALATOR ACCEPTABLE

Manufacturer: E & J Manufacturing Company, 139 South Verdugo Road, Glendale, Calif.

The E & J Resuscitator and Inhalator may be used for producing artificial respiration by mechanical means or simply as an inhalator for providing a concentration of oxygen or a mixture of oxygen and carbon dioxide around the mouth and nostrils. The apparatus is available in three models, one portable and two for hospital service. The portable unit weighs 100 pounds complete with gas cylinders. The resuscitator side¹ of the appliance produces artificial respiration by setting up in the



E & J Resuscitator and Inhalator.

lungs a sequence of alternating positive and negative pressures. The stroke automatically adjusts itself within limits to the lung capacity of the patient. While both positive and negative pressures are set at the factory, the gas flow may be regulated by a control valve at the will of the operator. Since the gas volume is adjusted to the lung capacity of the adult to produce the proper number of respirations per minute, the same flow would cause a more rapid respiratory rate in a child with smaller lung capacity. A regulator control valve is placed on the apparatus, which enables the operator to reduce gradually the flow of oxygen, thus automatically reducing the number of respirations per minute.

The inhalator side² of the apparatus supplies a constant flow of oxygen or oxygen and carbon dioxide mixture to the mouth and nostrils. The transfer from the resuscitator to the inhalator side of the device is accomplished by means of a lever, so that either one or the other technic is independently available.

The E & J Resuscitator and Inhalator is designed to be used in emergencies in which natural respiration has failed with resulting asphyxia. The portable unit may be employed by fire and police departments, by life guards and mine rescue squads, and by other trained organizations rendering first aid. The hospital unit is provided for such respiratory emergencies as arise in hospital practice.

When used as a resuscitator, gas pressure in the tank operates the pistons contained within the mechanism. A face mask is fitted tightly over the patient's nose and mouth after an "Air-way" (a wire device for holding down the tongue to clear a passage to the trachea) is placed in the patient's mouth. Gas, after passing through and actuating the apparatus, enters

the face mask through a hose and is carried into the trachea and lungs at a pressure of from 12 to 14 mm. of mercury. There is a safety valve on the mask which is set at the factory and releases at approximately 18 mm. of mercury. The gas is withdrawn under a smaller negative pressure of from 7 to 9 mm. of mercury below the atmospheric level. The exhaled gas returns through another hose to a separate cylinder, creating the vacuum in the mechanism, and is finally discharged into the atmosphere. Briefly, therefore, the resuscitator is operated by the energy of the gas stored in the tank under pressure, while the selfsame gas is used in the lungs for resuscitation purposes. If the throat is filled with mucus, an aspirator, a separate accessory, is available which utilizes the negative pressure phase of the resuscitator cycle to clear the air passages.

After natural breathing has resumed, by the turn of a lever the respirator is turned off and the inhalator turned on for such time as is deemed necessary. When the inhalator side is used, the gas passes from the tank through a regulating valve, thence into a rubber breathing bag and finally to the patient's mask. On exhalation, it passes through the auxiliary exhalation valve and out to the atmosphere. The inhalator side of the apparatus is similar in operation to other inhalators accepted by the Council.

In cleaning the apparatus, the firm recommends the use of 20 per cent aqueous solution of green soap, worked into a good lather, and the face cushion, celluloid mask, mask valve and hose leading to the apparatus should be scrubbed with this solution. Then the parts should be rinsed with clear water, and given a second washing with an aqueous solution 50 per cent alcohol and allowed to dry.

The evidence that has been made available indicates quite clearly that the machine has demonstrated its worth in trained hands. The critical data consisted of many reports on the use of the resuscitator in the fields of surgery and obstetrics.

It must be pointed out, however, that the process of blowing oxygen into the lungs and aspirating it has a reverse effect on the circulation from that of normal respiration. Normal respiration tends to facilitate the exchange of gases in the lung capillaries. When the lung is inflated, even at very moderate pressures, circulation through the lung capillaries is retarded for an instant, since the blood pressure in these capillaries is very small. Stoppage here necessarily affects the entire circulation. However, periodic stops last only a moment, since the peak pressure (14 mm. of mercury) is maintained for only a short part of the cycle.

Another point should be borne in mind. While artificial respiration has been maintained by systems of this type in physiologic laboratories where experiments are performed on animals with the chest opened, the pressure required for adequate ventilation in such cases is much less than that required to distend the lung when the diaphragm must be forced down against the pressure of the abdominal contents and the bony thorax distended by pressure exerted by the lung from within.

In accepting the apparatus the Council wishes to stress two points, namely: (a) no artificial resuscitator or inhalator should replace the training of medical men and first aid men in the prone pressure method of resuscitation; (b) it is very important that this machine be used by well trained operators who have received their instruction from competent physicians.

The acceptance of this apparatus, therefore, is not to be regarded as a recommendation to abandon prone pressure methods of artificial respiration. In cases needing resuscitation the prone pressure method should be instituted immediately pending the arrival of any type of resuscitator, inhalator, or respirator, providing the patient's condition permits.

It is manifestly impossible to apply prone pressure artificial respiration in all conditions which arise in medical practice, as instanced in surgical operation on the abdomen when respiration fails. In such cases a mechanical device for maintaining artificial respiration over short periods may be very desirable. Operators who are trained to use the mechanical resuscitator should also be equally well trained in the prone pressure method of artificial respiration.

In view of its findings, the Council on Physical Therapy has voted to accept the E & J Resuscitator and Inhalator for inclu-

1. Resuscitator, an apparatus for revivifying, reviving or restoring from apparent death or from unconsciousness.

2. Inhalator, an apparatus for facilitating the breathing or drawing in of gas or a spray.

sion in its list of accepted apparatus, with an understanding of the limitations and hazards of positive pressure resuscitators, with the expectation that it will be used only by professional or other adequately trained personnel.

RESUSCITATION

A Comment by the Secretary of the Council on Physical Therapy

Historical documents record that man has tried innumerable methods, in one form or another, of reviving victims of asphyxia. Probably the earliest record of an attempt to resuscitate is in the Bible. Here it is said that Elisha brought back to life the son of a Shunamite woman by breathing into the mouth of the child.

We find also that in the early ages men employed burning and cutting of the skin, used boiling water, burning oil, whipping and noise as means of reviving the victim, as well as less drastic procedures, such as the application of heat by warm clay or ashes and warm poultices.¹ Counter shock, contrast baths, electrical stimulation, ducking in water, and blows on the soles of the feet and at the region of the heart are recorded. Two unusual methods were the drawing of a couple of teeth and the administration of wine or brandy. Of these two, if the patient was lucky enough to be revived, undoubtedly he preferred the latter rather than the former method. Fumigation has been used, that is, blowing tobacco smoke or charcoal fumes into the mouth or into the rectum. The rolling methods were tried; for example, rolling the patient over and over like a barrel, rolling him in a barrel or rolling him on a barrel. Manipulation, such as moving the arms in and out or up and down, working the legs, applying pressure alternately to the stomach and then to the chest or turning the victim back and forth from side to back are also recorded. Other methods were laying the patient face down or on his back and lifting his hips up and down, and countless other methods. Such were some of the practices of medical antiquity.

One method, placing the patient in a prone position and, among other operations, applying pressure to the small of the back, has survived. It is known as the Schafer prone pressure method. Careful investigation of the physiology involved has led to its acceptance and recognition.

When oxygen was discovered, it was used for resuscitation. At the present time a mixture of oxygen and carbon dioxide gas is an acceptable method, since investigation has shown that carbon dioxide stimulates the respiratory centers.²

Concurrently with some of the aforementioned methods, mechanical means were introduced in the sixteenth century. So we learn that Paracelsus of Switzerland in 1530 was the first to make use of the common fireside bellows for introducing air into the lungs of the apparently drowned person. In 1776 John Hunter improved the bellows for filling the lungs with fresh air and withdrawing exhaled breath from the patient. This method appeared to be so useful in the opinion of the Royal Humane Society of London that it was adopted by that organization in 1782. In 1911 the pulmotor appeared on the market. This was an automatic pumping device energized by the compressed gas within the tanks, which introduced gas into the air passages and sucked it out.

The report of the Council on Physical Therapy in this issue on the E & J Resuscitator and Inhalator precedes this item. It is energized by compressed gas stored in the two tanks in the carrying case. By a positive and negative pressure created at the mouth and nose within a face mask, gas passes back and forth within the air passages. The device automatically regulates itself to the size of the lungs and is provided with safety appliances. For the past seven years the Council on Physical Therapy has given careful consideration to mechanical resuscitating apparatus and has accepted the Drinker and Emerson respirators, both adult and infant size. The Council has also considered and accepted inhalators of various makes which provide an atmosphere of oxygen and carbon dioxide at the nose

and mouth of the victim. These appliances, such as the H-H Inhalator and the Davis and the B-K Inhalators, are used in conjunction with the Schafer prone pressure method of resuscitation.

There follows a communication from Dr. Yandell Henderson and the Council's reply. Dr. Henderson is a recognized authority in the field of resuscitation and is a champion of the Schafer prone pressure method of resuscitation and one of the originators of the H-H Inhalator. He has opposed mechanical methods of the blow and suck type of resuscitator. One of his reasons is that the promotion of this kind of resuscitation will have a tendency to depreciate the value of the Schafer prone pressure method. In accepting the E & J Resuscitator the Council points out most emphatically that acceptance is not a recommendation to abandon the Schafer prone pressure method but that safety organizations, Boy Scouts, Red Cross and all other first aid groups should be carefully instructed in the use of this valuable measure. It is very important, the Council states, that all resuscitators and inhalators be used by well trained operators who have received their instructions from competent physicians.

As an indication of the care which the Councils of the Association take in consideration of products, the E & J Resuscitator is an excellent example. The Council on Physical Therapy has considered this product for a period of several years. During this time there have been numerous charges and countercharges received from several sources and in most cases the arguments were sincere. In such a situation the Council is not to be deterred from its cardinal principle—that it will not accept an apparatus for inclusion in its list of accepted apparatus until it is satisfied by the evidence and unless the manufacturer limits its claims to what the Council considers true and justified. The Council has spent a great deal of time in going over painstakingly the evidence which has been presented, which involves mechanical construction, principles, physiology and respiration, and other material.

AN OPEN LETTER BY DR. YANDELL HENDERSON

To the Board of Trustees:—For some years past the American Medical Association has maintained a Council on Physical Therapy. Like the Council on Pharmacy and Chemistry, it is intended to afford the medical profession the technical advice that will maintain high standards of therapy and protect the public against harmful materials and methods. Yet in one of the most important fields of physical therapy—that of resuscitation—the influence of the Council, instead of being beneficial, is becoming extremely harmful. It is lowering standards and promoting methods and devices that will severely decrease the saving of life.

Three points require particular attention: 1. The Council on Physical Therapy is antagonizing a policy for general training in manual artificial respiration followed with marked success for many years by the American Red Cross. 2. It is approving apparatus that, if generally adopted, will seriously decrease the efficiency of the treatment of carbon monoxide poisoning and thereby largely increase the mortality. 3. It is tolerating and thereby virtually approving and promoting apparatus of the pulmotor type for application to the asphyxial newborn, which apparatus, if it works at all, administers a form of artificial respiration that tends rather to induce than to overcome atelectasis, and that in addition sometimes causes serious damage to the lungs.

I. Although I have no official authority to speak for the Red Cross, I have a reason for defending its methods of resuscitation, which I believe to be equally valid. Twenty-six years ago, in 1912, at the request of the director of the United States Bureau of Mines, the American Medical Association appointed a committee to investigate the subject of resuscitation from asphyxia by mine gases and, in particular, to recommend the best method of administering artificial respiration. The committee (generally referred to as the First Resuscitation Commission) included W. B. Cannon, chairman, G. W. Crile, Joseph Erlanger, S. J. Meltzer and myself. At the request of the National Electric Light Association this committee was enlarged by the addition of several electrical experts, including Elihu Thompson and A. E. Kennelly, to form the Second Resuscita-

1. Fisher, Hart Ellis: The Evolution of Resuscitation, Transactions of National Safety Council, 1931.
2. Henderson, Yandell: Resuscitation, J. A. M. A. 103:750 (Sept. 8), 834 (Sept. 15) 1934.

tion Commission for the investigation of electric shock. Under both commissions we made very thorough investigations—among which I dealt particularly with manual artificial respiration; and on these investigations we based positive recommendations. These recommendations were at once adopted by the Bureau of Mines (Technical Paper 77, 1914), the United States Navy, the electric light industry and, most important of all, the American Red Cross. The chief recommendations were (1) the elimination of all mechanical appliances for giving artificial respiration under field conditions, and (2) universal training in the Schafer prone pressure method of artificial respiration. For the elimination of mechanical apparatus, of which four types were tested, several reasons were given: 1. At best such apparatus was found to be no more effective than the manual method. 2. A face mask frequently leaks and automatic apparatus often fails to operate as intended. 3. Experience proves that in any community where there is such apparatus the training in manual artificial respiration is neglected, the apparatus is sent for and the early moments of asphyxia, which are critical for the saving of life, are lost. 4. The form of respiration induced by the pulmotor, the appliance to which we devoted most careful consideration, was found to be distinctly unphysiologic and prone to induce atelectasis and to cause serious injury to the lungs.

In 1917 a third commission reviewed and generally confirmed these recommendations (*Science* 48:563, 1918). Among its members were S. J. Meltzer, chairman, E. F. Du Bois, D. L. Edsall, W. H. Howell, Reid Hunt, C. A. Lauffer, J. W. Schereschewsky, G. N. Stewart, E. B. Vedder, C. H. Frazier and Yandell Henderson, and for the electrical industry Elihu Thompson, A. E. Kennelly, Wills MacLachlan and C. B. Scott. And in 1922 a fourth commission (*J. Indust. Hyg.* 6:125, 1923), which included C. K. Drinker, chairman, W. B. Cannon, D. L. Edsall, H. W. Haggard, L. J. Henderson, Yandell Henderson, W. K. Lewis, F. W. Peabody and R. R. Sayers also disapproved mechanical artificial resuscitation devices, particularly those of the pulmotor type, and advocated general training in manual artificial respiration for use in such emergencies as drowning and electric shock. It was under this fourth commission that the treatment of carbon monoxide asphyxia by inhalation of a mixture of carbon dioxide with oxygen was developed and introduced (Drinker, C. K.: Carbon Monoxide Asphyxia, Oxford University Press, 1938. Henderson, Yandell: Adventures in Respiration, Baltimore: Williams & Wilkins Company, 1938).

Largely under the influence of the Red Cross, based on the reports of these commissions, more than 13 million policemen, firemen, boy scouts and others have been trained to administer manual artificial respiration and many lives are now thereby saved. It is deplorable that the influence of the Council on Physical Therapy should now be exerted against the recommendations of these commissions and against such training. Yet this influence is becoming effective, for a letter recently received asks me whether I advocate "resuscitators," by which name devices of the pulmotor type are now called, and notes "a strong tendency toward the use of resuscitators and elimination of the prone pressure method."

II. Having myself formerly served as a member of the Council on Physical Therapy, and having from time to time corresponded with its Chairman and Secretary, I have been led to conclude that the attitude of the Council in regard to the recommendations of these four commissions is not really one of opposition. It is merely one of ignorance. The Council is evidently unacquainted with the work that was done under these commissions. None of the members of the Council are specialists in the subject of resuscitation nor do they seem to realize that resuscitation is a very specialized subject. Each device that is submitted to the Council is merely referred to a referee; and while I was in the Council the reports of these referees, of whose names I was never informed, showed that their anonymous authors in many cases lacked both the general knowledge and the practical experience that the evaluation of any device in the field of resuscitation requires.

I will instance two such devices. One is an inhalator for the treatment of carbon monoxide asphyxia. When I wrote to the Secretary of the Council in regard to this device he replied "The Council has accepted the S. O. S. Inhalator put

out by the Oxygen Equipment and Service Company of Chicago. This device, as you know, looks very much like other inhalators that have been accepted by the Council." Yet, in fact, this device is essentially different from and inferior to the inhalators now used by the rescue crews of city fire departments and other organizations. Those inhalators are particularly designed to administer a mixture of carbon dioxide with oxygen and to promote the rapid elimination of carbon monoxide by the avoidance of all rebreathing. This inhalator, on the contrary, can use only pure oxygen, for if carbon dioxide were added the small supply of oxygen in its little cylinders would be almost immediately exhausted. And it expressly provides for at least partial rebreathing, which will correspondingly prevent the elimination of carbon monoxide and prolong the asphyxia. It is, in fact, simply an oxygen inhalator like those used twenty years ago, before the modern treatment of asphyxia was developed.

The referee on this device was evidently unaware of the developments of recent years in regard to asphyxia and its treatment. And the Council in accepting his report either showed a similar degree of unawareness or else neglected to give the matter any serious consideration. The result of the approval of this device will be the loss of many lives that could and should be saved.

I venture therefore to suggest that, if the Council cannot devote the requisite knowledge, care and time to the examination of devices in the field of resuscitation, it could at least follow the lead and adopt the recommendations of another organization, namely the committee on safety of the American Gas Association. That association includes practically all of the city gas companies and is therefore vitally interested in holding the mortality from carbon monoxide asphyxia to a minimum. Its committee on safety does apply modern knowledge to this field and does devote the requisite time and care to its recommendations to afford the public the protection that it needs.

The other device to which I refer is the E & J Resuscitator. This device has been before the Council for about five years during which time its sales agents have continually claimed that it was about to be approved. And as two advertisements of it have appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (a full page advertisement on June 25, 1938, and previously a smaller one on May 7), and as it has been exhibited at the annual meeting of the Association, a formal approval would scarcely have been more effective in foisting this device on hospitals, bathing beaches and various other agencies concerned with resuscitation.

Yet this so-called "resuscitator" is to all intents and purposes simply a pulmotor under another name. All the objections that applied to the pulmotor apply equally to this device, and it is needless to rehearse them. But one additional objection must be mentioned. It arises from the interest that has developed in recent years in regard to the asphyxia and resuscitation of the newborn. The lungs at birth are in a state of atelectasis, and even in the normal child they are only gradually dilated. It should be obvious then that in the treatment of asphyxia of the newborn nothing should be done to collapse them. Yet in the artificial respiration produced by this "resuscitator" and similar apparatus of the pulmotor type not only inflation but also deflation is applied. Its action, as should be expected, tends therefore not to promote but rather to oppose the dilatation of the lungs and often causes serious injury, demonstrable at autopsy. After application of this apparatus the survival of the baby is in fact rare. How injurious the E & J Resuscitator may be is shown in a recent paper by Dr. F. N. Coryllos. Dr. Coryllos was himself a supporter of the value of this device for use in connection with thoracic surgical operations. Nevertheless he found that, when healthy dogs were submitted to artificial respiration by means of it, the lungs after a few hours were in several cases too far collapsed and damaged for the animals to survive (*Surg., Gynec. & Obst.* 66:698 [April] 1938).

The case against this device could scarcely be clearer or stronger. Yet year after year goes by and the Council still hesitates to approve or disapprove while the device appears to have an increasing sale at bathing beaches and in the maternity wards of hospitals.

III. If these two devices stood by themselves, the case against them would scarcely justify so unusual a motion as this appeal over the heads of the Council on Physical Therapy to the Board of Trustees of the American Medical Association. But in fact there is probably no subject other than that of perpetual motion apparatus that exercises so strong a lure for ignorant inventors as that of restoring the dead to life. There is certain to be in future, as in the past, a long succession of devices invented for this purpose. And it is of literally vital importance that, if there is to be a Council on Physical Therapy and it is to pass on such devices, it should be competent and use competent means and agents. In particular, it should free itself from the popular but fallacious assumption on which the invention of all pulmotors, resuscitators and other artificial respiration devices is based that the restoration of respiration in a nonbreathing patient is like starting the motor of an automobile: in other words, that if the thorax is put through the movements of breathing by vigorous "cranking" it will pick up the rhythm and continue to run. In fact, on the contrary, natural respiration is induced only by chemical not mechanical conditions; and those conditions are the supply of oxygen and carbon dioxide through the blood from the lungs to the respiratory center in the base of the brain. It is for this reason that the inhalators used by the rescue crews as adjuncts to manual artificial respiration on cases of submersion and electric shock are superior to all apparatus of the pulmotor type. The fact that such apparatus is able to inflate and deflate a rubber doll is impressive only to those who are untrained in the physiology of respiration.

YANDELL HENDERSON, PH.D., New Haven, Conn.

THE COUNCIL ON PHYSICAL THERAPY VOTED TO ADOPT THE FOLLOWING
REPLY.

HOWARD A. CARTER, Secretary.

REPLY TO THE OPEN LETTER FROM DR. YANDELL HENDERSON

The Council on Physical Therapy has devoted much time to the entire subject of resuscitation in relation to all types of respirators, resuscitators and inhalators.

Dr. Henderson's first charge is that the Council on Physical Therapy "is lowering standards and promoting methods and devices that will severely decrease the saving of life." The Council has on many occasions emphasized the importance of the Schafer prone pressure method of artificial respiration. In the booklet "Apparatus Accepted" the Council describes and promotes this life-saving measure. The Council will continue to publicize this important method and will vigorously combat any effort on the part of an institution or organization to discard it.

Dr. Henderson's second charge is that the Council "is approving apparatus that, if generally adopted, will seriously decrease the efficiency of the treatment of carbon monoxide poisoning and thereby largely increase the mortality." The Council has accepted the Drinker and Emerson types of respirators, which are of unquestionable value especially in infantile paralysis: the H-H Inhalator, the B-K Inhalator, and the Davis Inhalator, which functions on the same principle as the H-H Inhalator. All of these appliances have been on the Council's accepted list for several years.

Further on in the letter Dr. Henderson refers to the S. O. S. Inhalator. Although the Council has given consideration to this product, it has not released a report of acceptance on this unit and does not expect to until further evidence is submitted by the manufacturer to substantiate certain claims made. At present, therefore, this product stands neither accepted nor rejected. The firm has been asked to submit further evidence of its efficacy as, for example, a report of animal experiments definitely showing the amount of carbon monoxide present in the bag when the inhalator is being used in resuscitation.

The third charge is that the Council "is tolerating and thereby virtually approving and promoting apparatus of the pulmotor type for application to the asphyxial newborn, which apparatus, if it works at all, administers a form of artificial respiration that tends rather to induce than to overcome atelec-

tasis, and that in addition sometimes causes serious damage to the lungs." Following this charge Dr. Henderson gives a detailed study of appointments of commissions by the Red Cross, American Medical Association, National Electric Light Association and engineering societies and a report of the findings of these commissions. He intimates that the Council is not familiar with the work of these commissions or their results and definitely states that the Council has no member or members familiar with the subject of resuscitation—"nor do they seem to realize that resuscitation is a very specialized subject." He further condemns the Council's method of referring these appliances to referees "of whose names I was never informed."

In reply the Council would state that it has made exhaustive studies of the E & J Resuscitator (the product to which Dr. Henderson refers later on in his letter) to satisfy itself that the apparatus was not of the old type pulmotor. The Council is thoroughly familiar with the work of the commissions to which Dr. Henderson refers and also with their reports concerning the Schafer prone pressure method of resuscitation, to the use of the inhalator type of apparatus and to the condemnation of the old type pulmotor.

Investigation indicates that the S. O. S. Inhalator has been used by several fire and police departments in the vicinity of Chicago with success. This product, therefore, is definitely a product in competition with accepted inhalators.

Furthermore, the Oxygen Equipment and Manufacturing Company is refilling tanks with carbon dioxide and oxygen mixture, which is the mixture furnished by the Mine Safety Appliances and marketed under the trade name of "Carbogen." (Carbogen is not accepted by the Council on Pharmacy and Chemistry.) The refilling of tanks has reduced the cost of this mixture, especially in the vicinity of Chicago. Furthermore, one of the charges of Dr. Henderson, that is, that the tanks are too small and that "its little cylinders would be almost immediately exhausted," is denied by the manufacturer, since the tanks are one-half the size of those furnished by the Mine Safety Appliances Company and other firms. The firm points out that a user of this equipment can lay in a supply of tanks and can, in fact, connect the unit to a large sized oxygen tank if the occasion arises.

The E & J Resuscitator and Inhalator was first discussed in *Queries and Minor Notes* in THE JOURNAL Nov. 16, 1929, page 1583. The reply condemned the E & J Resuscitator. In February 1934 the E & J Resuscitator and Inhalator was submitted to the Council for consideration. After investigation, a report of rejection was referred to the firm. The E & J Manufacturing Company pointed out that in its opinion the report was in error and submitted arguments that convinced the majority of the Council members that further investigation was indicated.

A leading chief surgeon of a large corporation, who had considerable experience with the E & J Resuscitator and Inhalator, not only wrote to the Council but made a trip to Chicago to interview the Chairman, the Secretary and one other member of the Council. He presented evidence showing that a number of these resuscitators were in use in various plants of which he was in charge and that they had rendered definite life-saving service in many instances.

The Council has selected specialists of known reputation to serve as referees for all inhalators and resuscitators. Since 1935 at least four referees, specialists in the field, have investigated independently the E & J Resuscitator and Inhalator and made reports to the Council.

During the year 1936 the E & J Manufacturing Company submitted evidence to the Council accumulated by the late Dr. Pol Coryllos. Dr. Coryllos's paper was published in *Surgery, Gynecology and Obstetrics* in April 1938 but the substance of the report, together with motion pictures, was furnished the Council in 1936. The work of Dr. Coryllos, in the opinion of the Council, was well done and convinced the members that the E & J Resuscitator and Inhalator was a safe appliance, that it had real life-saving value and that an injustice would have been done to its manufacturer if the original report of rejection had been published.

Thirty-nine different physicians of recognized professional ability were asked by the Council to submit reports of cases treated with the E & J Resuscitator. The vast majority of these reports were highly favorable to the resuscitator in spite of the fact that many of the patients were practically moribund at the time when resuscitation was initiated.

Finally, the Council had submitted to it a report of Dr. D. Ben Martinez, published in *THE JOURNAL* Aug. 14, 1937, in which he reported 500 cases of resuscitation of the newborn; the E & J Resuscitator was used in these cases.

A large midwestern fire department uses the E & J Resuscitator and Inhalator in preference to inhalators, giving as reasons: 1. Inhalators require at least two, or preferably three, men to operate, while the E & J Resuscitator requires but one man. 2. Inhalators require more space to use than does the resuscitator. 3. The E & J Resuscitator is more practical when used on a pregnant woman or on a person with broken ribs. 4. Better results are obtained with the E & J Resuscitator. The fire department has defended its use of the E & J Resuscitator in the face of opposition. It has convinced its city's health department that the resuscitator is efficient. The department had three E & J Resuscitators in 1931 and in 1934 purchased seven more and now it has twelve. Squads are well trained in the use of this apparatus and are also well trained in the use of inhalators and the Schafer prone pressure method. They demonstrated completely their ability to use this apparatus to the complete satisfaction of a committee of the Council.

Therefore, in reply to Dr. Henderson's charges that the Council on Physical Therapy is not familiar with resuscitation, that it depends simply on the statements of referees of questionable ability, and that it is accepting apparatus that will "lower standards and promote methods and devices that will severely decrease the saving of life," the Council submits the foregoing information to demonstrate the thoroughness of its investigation of the E & J Resuscitator and the effort the Council has put forth to avoid the loss of a single life through any of its published actions.

COUNCIL ON PHYSICAL THERAPY.
HARRY E. MOCK, M.D., Chairman.
HOWARD A. CARTER, Secretary.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
PAUL NICHOLAS LEECH, Secretary.

THE PRESENT STATUS OF TESTOSTERONE PROPIONATE: THREE BRANDS, PERANDREN, ORETON AND NEO-HOMBREOL (ROCHE-ORGANON) NOT ACCEPTABLE FOR N. N. R.

Within the past few months extravagant claims for the action of the male sex hormone testosterone have appeared in professional and lay publications. The naturally popular appeal of this substance has aroused wide interest with the aid of ample newspaper publicity. It may eventually prove that this substance, testosterone, or its esters will be a valuable addition to our armamentarium of glandular therapy; but it is the Council's belief that many claims for it have been grossly exaggerated. The male hormone has only recently been made available for clinical use and there have already been widespread announcements of its remarkable effects, both physical and psychic, which are a long way from actually being established. In view of the uncontrolled advertising and publicity, the Council is issuing this report on the status of the male hormone.

Testosterone, the male or testicular hormone, was first isolated from bulls' testes. It is not to be confused with androsterone, which appears in human urine. After establishment of its formula, Ruzicka was able to prepare the identical substance synthetically. It is generally accepted that testosterone is the

substance secreted by the interstitial cells of the testes and that its function is the induction and maintenance of the secondary sex characteristics of the male. Fatty acid esters of testosterone are more slowly absorbed from the site of injection than the free testosterone. It apparently acts by simulating gonadal activity and in this manner the physiologic response has been observed to improve considerably. The most widely used ester at present is the propionate of testosterone.

In the clinical use of most endocrine preparations it seems to be a fairly consistent rule that the response to any hormone is most efficient and satisfactory when there already exists a clearly defined deficiency of that substance. This rule holds quite well for the male hormone and aids in indicating the use of this substance. Therapy has been attempted in the following conditions and, while the treatment of all of them is still in the experimental stage, it appears that results are promising in only a few.

EUNUCHOIDISM

The most careful studies in the clinical use of testosterone have been made in cases of eunuchoidism.¹ The cases of testicular deficiency reported by these workers were well defined. The testes were either absent or atrophic or else retained in the abdomen. The penis was underdeveloped and the prostate hypoplastic. Erections were infrequent or feeble and libido was negligible. Other signs and symptoms were typical: deficiency of pubic, facial and body hair, fine boyish skin and high pitched voice. Psychic conflicts were frequent, rendering the patient anxious, depressed and apathetic with a feeling of social inferiority. Occasionally the patients suffered from hot flashes, irritability and depression, symptoms typical of the climacteric.

The response to testosterone propionate was reported to be excellent. Within a short time sexual desire was initiated, erections became frequent and satisfactory, and nocturnal emissions occurred. After several months of continuous treatment the hair growth became heavier, the skin reverted to the adult type and the voice changed to a lower pitch. The prostate in a few cases enlarged somewhat and the penis approached normal dimensions. The psychic responses were no less spectacular. Relief from climacteric distress was complete, self assurance returned and emotional stability was manifested. Some of the beneficial results on the psyche may have been merely the reflection of the patient's pleasure in the physical changes and the sensations of sexual activity.

The dosage required to bring about these changes varied considerably. According to Kenyon,² from 7 to 21 mg. of testosterone is metabolized and lost daily in the urine and on these grounds he believes that 25 mg. daily is a reasonable amount for injection. Results have been obtained with smaller doses, but the preponderance of opinion indicates that from 75 to 150 mg. per week is necessary for complete replacement therapy. It cannot be stressed too strongly that the desired effects persist only as long as the therapy is maintained. No cure should be expected and regression of all beneficial changes takes place soon after the last injection. It is obvious, therefore, that androgenic therapy is an expensive procedure. Although the experimental treatment of eunuchoidism has proved successful, social and economic factors are formidable obstacles when this therapy is applied to the private patient. The careful selection of cases and the use of great caution are demanded for the proper treatment of this condition.^{2a}

1. Hamilton, J. B.: Treatment of Sexual Underdevelopment with Synthetic Male Hormone Substance, *Endocrinology* 21: 677 (Sept.) 1937. Vest, S. A., Jr., and Howard, J. E.: *Endocrinology*, with the Use of Male Sex Hormone: Use of Testosterone Propionate in Hypogonadism, *J. Urol.* 40: 154 (July) 1938.

2. Kenyon, A. T.: The Effect of Testosterone Propionate on the Genitalia, Prostate, Secondary Sex Characters and Body Weight in Eunuchoidism, *Endocrinology* 23: 121 (Aug.) 1938.

2a. A well known news weekly has recently given wide publicity to the method adopted by Foss in England of administering to patients testosterone propionate by injection. Following this work, several firms have put on the market ointments containing testosterone propionate. Foss and also Parkes administered to several eunuchs doses of from 20 to 50 mg. of testosterone propionate in about 2 cc. of ointment daily in order to obtain satisfactory results. The products marketed in this country contain only 2 mg. of the androgen per cubic centimeter of ointment. It is apparent, therefore, that to administer the appropriate amount of active material the patient must anoint himself with from 10 to 25 cc. of ointment daily. This would, of course, make quite a mess.

IMPOTENCE

The great majority of young men who complain of impotence suffer from so-called psychic impotence. The few cases reported in the literature which were treated with androgens did not respond very favorably.³ This is in line with the rule just stated that the male hormone works best when there exists a deficiency. The males with a psychic disturbance have normally functioning testes and the additional male hormone provided by injection does not appear to correct this disturbance. Transitory improvement reported in several cases is probably the result of suggestion. There is no evidence that testosterone propionate has an aphrodisiac action in males with normal testicular function.

SENILITY

It appears that many pharmaceutical firms would have one believe that in the ampule of testosterone propionate lies the Fountain of Youth. The few reports in the literature of attempted rejuvenation are not at all promising. Laroche and Bompard⁴ injected several aged men with this material and failed to improve their sexual powers appreciably. Apparently the action of male hormone on the masculinity of an individual is effective only within a certain age limit. Other factors, nervous or circulatory, probably play a role in the mechanism of erection and their absence in elderly males may prevent the response to testosterone. Premature impotence may well fit into this category, but sufficient data are not at hand from which conclusions may be drawn. The involutional melancholia of males, for which testosterone has been suggested, has not been subjected to adequate trials to justify androgenic therapy other than on an experimental basis.

STERILITY

It is known that testosterone propionate will maintain spermatogenesis in the hypophysectomized rat, but once tubular degeneration has set in, it is unable to stimulate sperm formation. There is apparently some species difference in the response of the testes to androgens. Wells and Moore have shown that injections of male hormone stimulate spermatogenesis in the ground squirrel, while Moore and Price and others have demonstrated an atrophy of the testes in similarly treated adult rats. There is little clinical evidence that this substance is of any use in human male sterility. The few cases of therapeutic success reported in the literature certainly do not warrant the use of androgens in this disorder at the present time.

PROSTATISM

There are a number of reports dealing with the use of male hormone in prostatism.⁵ The impression seems general that improvement is evidenced in most cases on this type of treatment. In long standing cases of complete or incomplete retention there was a return of spontaneous urination soon after the first few injections. Frequency and nocturia decreased. The amount of residual urine diminished and the general condition of the patient improved following amelioration of the distress of prostatism. In most cases of prostatic hypertrophy there was no decrease in size of the organ. Laroche and his co-workers⁶ obtained in several cases a diminution in size of the prostate, but they were careful to point out that this was due probably to the disappearance of congestion and inflammation and not due to any regression of the prostatic adenoma. In this regard it seems ill advised to describe, as several authors do, the androgenic therapy as treatment of prostatic hypertrophy, when no evidence is at hand that the excess tissue is appreciably affected. As a matter of fact, it has been recently shown that "the injection of 285 to 1,125 mg. of testosterone propionate in from 12 to 95 days results in no significant restoration of the

involved prostate of presenility and in no observable alteration in the histological appearance of the tissues formed in benign hypertrophy."⁷ The actual mode of action of the androgen is unknown, the improvements being due possibly to an improvement in sphincter action, or relaxation of spasm, an increase in bladder tone or an attenuation of prostatic congestion.

On the other hand, Clarke⁸ believes that conservative treatment is just as effective. He has followed ninety-three cases of prostatism and shown a large number of satisfactory responses on instrumentation alone. He suggested that a period of five years is necessary before results of endocrine therapy can be reliably assessed. The view taken by Riches⁹ is an admirable one and strikes a note of caution in accepting this newer treatment of prostatism:

The natural history of prostatic obstruction is one of frequent remissions and relapses, and many vaunted remedies in the past have owed their ephemeral reputations to their use at a time when acute congestive retention has just been relieved by catheterization. After a period perhaps of years it has been found that the prostatic enlargement has steadily progressed and has ultimately required operation when the patient is older and less fit and his kidneys have begun to fail. Herein lies the greatest danger of treatment by male hormone and it must be emphasized that all such treatment is still in the experimental stage, and is, therefore, only justified in patients who are not so ill as to need active surgical treatment or are too ill to stand much chance of surviving such treatment. The field for experiment is thus greatly reduced and the assessment of results is made difficult by the normal remissions and relapses incident to the disease.

CRYPTORCHIDISM

Hamilton¹⁰ has induced descent of the testes in immature monkeys by means of testosterone propionate injections. He has also obtained these results in cryptorchid boys and has suggested that androgens may be of value in the differential diagnosis of obstructive and nonobstructive cryptorchidism. By administering such therapy, the physician need not wait until puberty to know whether the testes will descend spontaneously. In Hamilton's opinion, male hormone may also aid in the surgical treatment of undescended testes. These recommendations are attractive, but approval must await further clinical trial.

On the other hand, Kunstader¹¹ warns against the induction of precocious puberty in boys by means of androgens. He observed some patients who were relatively sensitive to the androgenic substance, developing definite masculine traits after the administration of a moderate amount of this material. He considered these reactions harmful to the patient, especially from the psychologic standpoint. There have been several cases reported in the literature in which boys on androgenic treatment have resorted to masturbation and other undesirable behavior. It is highly important to remember that normal puberty varies considerably in its time of appearance. The diagnosis of hypogonadism in boys should be made with reserve and the endocrine treatment on the presumption of this condition should be accordingly avoided.

GYNECOLOGIC CONDITIONS

Estrous cycles of rodents have been suppressed by means of testosterone administration on the basis of its similarity to progesterone. In the monkey, Zuckerman¹² inhibited menstruation and obtained involution of the endometrium and ovarian atrophy by injections of androgenic substance. Inhibition of menstruation has also been obtained in the human being by Hartman¹³ and by Papanicolaou and his co-workers.¹⁴ Several

3. Miller, N. E., and others: Mental and Physical Changes Following Male Hormone Treatment of Adult . . . and Psychic Impotence, *Proc. Soc. Exper. Biol.* . . . 1938. Laroche and Bompard.⁴

4. Laroche, G., and Bompard, E.: Essais de traitement de l'impuissance sexuelle masculine par l'hormone male, *Progrès méd.* 66: 530 (April 9) 1938.

5. Day, R. V., and others: Sex Hormone Therapy for Prostatism, *Am. J. Surg.* 39: 100 (Jan.) 1938. Laroche and others.⁶

6. Laroche, G., and others: Prostatic Hypertrophy: Results of Therapy with Testosterone Acetate and Propionate, *Presse méd.* 45: 932 (June 25) 1937.

7. Moore, R. A., and McLellan, A. M.: A Histological Study of the Effect of the Sex Hormones on the Human Prostate, *J. Urol.* 40: 641 (Nov.) 1938.

8. Clarke, Ruscoe: Prostate and Endocrine—Control Series, *Brit. J. Urol.* 9: 254 (Sept.) 1937.

9. Riches, E. W.: The Use of Male Sex Hormones, *Practitioner* 140: 60 (Jan.) 1938.

10. Hamilton, J. B.: Effect of Male Hormones upon the Descent of the Testes, *Anat. Rec.* 70: 533 (April 25) 1938.

11. Kunstader, R. H.: Induction of Premature Puberty with Androgenic Substance, *Endocrinology* 23: 661 (Nov.) 1933.

12. Zuckerman, S.: Inhibition of Menstruation and Ovulation by Means of . . . *Lancet* 2: 676 (Sept. 18) 1937.

13. Hartman, J. L.: Menstruation Inhibiting Action of Testosterone, *Proc. Soc. Exper. Biol. & Med.* 37: 87 (Oct.) 1937.

14. Papanicolaou, G. N., and others: Inhibitory Effects of Male Sex Hormone on Human Menstruation and Their Evaluation by Vaginal Smears, *Proc. Soc. Exper. Biol. & Med.* 37: 689 (Jan.) 1938.

investigators¹⁵ have treated cases of functional menorrhagia with testosterone propionate and have been able to decrease the uterine bleeding. Hundreds of milligrams of the material was usually necessary to produce the desired results. Desmarest and Capitan¹⁶ have reported beneficial results in mastopathy with somewhat smaller doses (100-200 mg.). Other conditions in which male hormone therapy has received trials are the menopause, undesired lactation and dysmenorrhea. Such treatment should be reserved for the present for the specialist in this field, since very little is known as to the proper handling of these cases except that to obtain desired results in most cases it appears necessary to employ tremendous doses of testosterone propionate. Very little is known regarding the permanence of these results. The practicability of this therapy is, therefore, rather doubtful just now. Furthermore, a definite harm is risked when male hormone is administered to females. Greenhill and Freed¹⁷ have induced a significant degree of virilism in women treated with this substance for certain gynecologic disorders including hirsutism and low voice. Other undesirable reactions may eventually be demonstrated.

MISCELLANEOUS

There are other conditions for which androgenic therapy has been suggested, such as atrophic rhinitis, acne and gynecomastia. The available data in such cases are either absent or inadequate to justify any claims of usefulness.

CONCLUSIONS

According to our present knowledge, testosterone propionate shows promise in only a few conditions. Careful studies have shown that it is adequate replacement therapy in true testicular deficiency (eunuchoidism), but the applicability of this therapy in actual practice is still undetermined. Its employment in cases of cryptorchidism, though not well established clinically, is on a sound physiologic basis. The relief so often elicited by testosterone propionate in cases of urinary retention due to prostatism is quite gratifying, but a reliable evaluation of the benefits or dangers of this treatment must await extensive experimentation over a period of years. All other claims are either exaggerated or immature and should be disregarded until substantial evidence becomes available on which to evaluate them.

The Council deferred further consideration of testosterone propionate until it has been properly evaluated by ample clinical experience.

On the basis of the foregoing report and without a detailed investigation of the advertising policies of the firms which market this substance, the Council also declared the marketed brands of testosterone propionate, namely Perandren (Ciba Pharmaceutical Products, Inc.), Oreton (Schering Corp.) and Neo-Hombreol (Roche-Organon) (Hoffmann-LaRoche, Inc.), unacceptable for inclusion in New and Nonofficial Remedies.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary

RACÉPHEDRINE HYDROCHLORIDE (See THE JOURNAL, April 1, 1939, p. 1257).

Racéphedrine Hydrochloride-Gane's Chemical Works, Inc.—A brand of racéphedrine hydrochloride-N. N. R.

Manufactured by Gane's Chemical Works, Inc., New York. No U. S. patent or trade mark.

15. Loeser, A. A.: Action of Testosterone Propionate on Uterus and Breast, *Lancet* 1: 373 (Feb. 12) 1938. Foss, G. L.: Action of Testosterone Propionate on Female: Clinical Application and Dosage, *Lancet* 1: 992 (April 30) 1938. Desmarest and Capitan.¹⁶

16. Desmarest and Mme. Capitan: Testosterone Acetate, Therapy of Mastopathies: Seventeen Cases, *Presse méd.* 45: 777 (May 26) 1937.

17. Personal communication.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED.

FRANKLIN C. BING, Secretary.

CELLU BRAND LOGANBERRY JUICE

Distributor.—Chicago Dietetic Supply House, Inc., Chicago.

Description.—Canned loganberry juice packed without added sugar.

Manufacture.—Good quality loganberries on which no spray material has been used are thoroughly washed, sorted for spoilage and foreign matter, preheated and pressed through ordinary press cloth. The juice is run into cans which are sealed and heat processed.

Analysis (submitted by distributor).—Moisture 90.0%, total solids 10.0%, ash 0.4%, fat (ether extract) 1.0%, protein (N \times 6.25) 0.2%, crude fiber 0.02%, carbohydrates other than crude fiber (by difference) 8.4%, invert sugar 8.3%, sucrose 0.1%.

Calories.—0.4 per gram; 11 per ounce.

RED & WHITE BRAND FLOUR (BLEACHED)

Distributor.—Slocum-Bergren Company, Minneapolis.

Manufacture.—Russell-Miller Milling Company, Minneapolis.

Description.—A long patent, bleached flour milled from hard winter wheat.

Manufacture.—Hard winter wheat is cleaned, washed, dried, scoured, tempered and milled by essentially the same procedures as described in THE JOURNAL, June 18, 1932, page 2210. The flour is bleached with 13 Gm. of a mixture of benzoyl peroxide and calcium phosphate and 2 Gm. of nitrogen trichloride per barrel.

Analysis (submitted by manufacturer).—Moisture 13.5%, total solids 86.5%, ash 0.5%, fat (ether extract) 1.5%, protein (N \times 5.7) 11.2%, sucrose 1.3%, reducing sugar as invert sugar 1.7%, crude fiber 1.0%, carbohydrates other than crude fiber (by difference) 72.3%.

Calories.—3.48 per gram; 99 per ounce.

MILLER'S BRAND SPAGHETTI, MACARONI AND MACARONI PRODUCTS

Manufacturer.—Miller's Food Products, Inc., Los Angeles.

Description.—Spaghetti and macaroni, of various sizes and shapes, prepared from durum wheat semolina and water.

Manufacture.—Durum semolina and water in formula proportions are mechanically mixed and kneaded. The resulting dough is forced through a pressing and cutting machine and the pieces are dried and packed.

Analysis (submitted by manufacturer).—Moisture 11.4%, total solids 88.6%, ash 0.6%, fat (ether extract) 0.3%, protein (N \times 5.7) 12.4%, crude fiber 0.4%, carbohydrates other than crude fiber (by difference) 74.9%.

Calories.—3.52 per gram; 100 per ounce.

CRADLE BABY BRAND STRAINED AND SEEDLESS APRICOT JAM

Manufacturer.—Glaser, Crandell Company, Chicago.

Description.—Canned strained apricot jam sweetened with sucrose. The jam may contain small amounts of added acid or pectin or both.

Manufacture.—Canned California apricots which conform to the specifications of the manufacturer are softened and subsequently treated as described for Cradle Baby Brand Strained and Seedless Fig Jam (THE JOURNAL, March 18, 1939, p. 1071).

Analysis (submitted by manufacturer).—Moisture 30.4%, total solids 69.6%, water insoluble solids 0.9%, water soluble solids 68.7%, ash 0.4%, protein (N \times 6.25) 0.4%, crude fiber 0.3%, carbohydrates other than crude fiber (by difference) 67.7%, acidity 0.8%.

Calories.—2.72 per gram; 77 per ounce.

THE CASE OF BRINKLEY VS. FISHBEIN

PROCEEDINGS OF A LIBEL SUIT BASED ON AN ARTICLE PUBLISHED IN *HYGEIA*

On March 22 in the District Court of the United States for the Western District of Texas began the trial of the case of *John R. Brinkley v. Morris Fishbein*, based on an article published in *Hygeia*, entitled "Modern Medical Charlatans." The judge was the Honorable Robert J. McMillan; the attorneys for the plaintiff, Messrs. Morriss & Morriss of San Antonio and Phil Foster of Del Rio; the defendant was represented by Messrs. Loesch, Scofield, Loesch & Burke of Chicago, Brooks, Napier, Brown & Matthews of San Antonio, and Boggess, LaCrosse & Lowrey of Del Rio, Texas.

The case attracted much attention, particularly in Del Rio, the home of Brinkley. The following statement by Millard Cope in the San Angelo (Texas) *Standard-Times* gives the setting of the stage:

"Inwardly, however, Del Rioans are hoping for a victory for Dr. Brinkley because they have not forgotten what he and his hospital meant to Del Rio when he performed his operations in Roswell Hotel here.

"He maintained a monthly pay roll estimated at between \$17,000 and \$20,000 before moving the hospital to Little Rock, Ark. That meant plenty to business in Del Rio.

"The manager of one of Del Rio's largest department stores said that firm lost a thousand dollars a month in accounts when the Brinkley hospital was moved. Postal receipts, so often used as a business barometer, reflected a decline when Dr. Brinkley's hospital was moved. In 1937, for instance, postal receipts aggregated \$54,167.54. (That was the year he testified as having grossed \$1,100,000.) Last year, however, with the Brinkley hospital in Little Rock, receipts dropped nearly a fifth to \$44,399.22.

"SAYS DEL RIO SUFFERED

"Del Rio suffered its greatest loss when Dr. Brinkley moved to Little Rock," declares H. Lippe, whose picture and curio business, he says, has shown a heavy loss.

"Over at the Del Rio National Bank, J. A. Walker reminds that any city the size of Del Rio will suffer when it loses such a pay roll as Dr. Brinkley maintained. 'Of course, Del Rio was getting along before we ever heard of Dr. Brinkley, and we'll still go along, but it's obvious that the hospital is missed.'

"The Chamber of Commerce, through James C. Netts, secretary, admits there are some vacant houses and waiting hotel and tourist camp rooms, which were filled when Dr. Brinkley attracted thousands of persons to his hospital annually. Some of the tourist camps were built to accommodate the influx of oldsters.

"Obviously, the Roswell Hotel, used by Dr. Brinkley as his hospital, is missing the patients and guests, drawn magnet-like to its registration desk. F. H. Childs, the manager, isn't experiencing so many full houses as before.

"Wherever one goes in Del Rio, virtually the same story is given. What city of 10,000 wouldn't miss a \$20,000 pay roll every month, plus spendings of thousands who came seeking a more potent sex life?"

In his article Mr. Cope gives the following description of Dr. Brinkley:

"Del Rioans have a kindly feeling for Dr. Brinkley for a lot of reasons other than the pay roll he maintained when he operated the hospital here. He maintains his home in Del Rio, a palace sort of Spanish-type architecture centered in a 12 acre tract. It's prettier at night, because the two lighted fountains are turned on, a dozen colors changing all the time as lights are thrown on water squirting 30 feet into the air. One has no difficulty in knowing its owner. The name "Dr. Brinkley" is in large letters on the gates to the blue-painted concrete drives, and the name flashes in neon on the fountains at night.

"Some say he has as much as \$200,000 invested in the place. Inside, visitors see furniture brought over from France, imported tapestries, carpets, and works of art. There is an \$11,000 pipe organ. In one of the rooms is a collection of perfumes which he has collected as a hobby and which now is valued at more than \$5,000. He collects a variety of things. He's just as likely to return from a world cruise with a collection of cameras as flamingoes, freak dogs or shotguns.

"The unusual Dr. Brinkley has a flair for the unusual.

"MAKES NUMEROUS DONATIONS

"He thought the high school should have a business course and donated the typewriters, desks and other equipment. He provides candy and fruit for every child in Del Rio at a Christmas party each season. When the Rotary Club sought to increase its student loan fund, he offered to match it, reaching into his pocket to display three \$500 bills. He offered \$25,000 cash if the city would cause a similar amount for a public library to be raised.

"Though he built radio station XERA at Villa Acuna, Mexico, across the Rio Grande, he now denies any ownership, explaining he sold his interest and buys time as any other advertiser who broadcasts.

"He is driven to the court trial each morning by Mrs. Brinkley in a long, specially built body Cadillac, its color as bright a red as any fire truck, on which the name "Dr. Brinkley" is inscribed in 13 places, from the hub caps to the trunk. She stops the car at the curb, they kiss, and he's met by a group of admirers as he walks toward the federal building.

"A FORTUNE IN DIAMONDS

"Nattily attired, his close-cropped Van Dyke neatly trimmed for his appearance in court, and with diamonds flashing on his fingers, a tie-clasp and in a lodge emblem across his vest, Dr. Brinkley reflects some of the wealth he has acquired. The diamond in the ring on one finger is 14 carats, he says. On the other hand is a smaller one. There's a line of big ones in the tie clasp worn above the top button of his vest. Some estimate he may have spent as high as \$100,000 for them. He has bought diamonds for Mrs. Brinkley, too.

"Transportation is not much of a problem for Dr. Brinkley. He goes by land, air or water. He literally has a fleet of high-powered automobiles. There is a Lockheed Electra monoplane, with pilot and co-pilot, a 12-passenger ship for which he paid \$58,000 and then added more than \$20,000 worth of extras.

"ADMIRAL OF THREE YACHTS

"He's an admiral in his own right, owning three yachts. A picture of Dr. Brinkley in his private admiral's uniform hangs in Editor Travelstead's office. It is autographed: 'To Warrior Travelstead from Fighting Admiral Brinkley.' He would have bought another yacht, but the \$1,000,000 price, he thought, was a little steep. It was the vessel on which abdicated King Edward VIII and the former Wally Simpson honeymooned in the Mediterranean. He had an associate contact a London broker as to the price.

"Hearing of the plight of orchard owners in the Rio Grande Valley in not being able to dispose of their fruit, he decided to buy an orchard. He passed up dividends for a few years by setting out new, choice trees. Now, his output is contracted. The grapefruit Dr. Fishbein ate Saturday morning in the Roswell Hotel came from the Brinkley orchard.

"Judge R. J. McMillan's oblong little court room in the federal building is filled an hour before each day's trial begins, but that doesn't mean there is much of a crowd on hand. Its seating capacity is less than 100, and some twenty-five or thirty form a waiting line outside.

"A CLASS TO THE TRIAL

"The Del Rio school civics class was taken to one of the court sessions by its teacher, Miss Mary Louise Nelson. It prompted the remark that it should have been the physiology class. Another suggested taking the vocational agriculture class, referring to the goat glands.

"Judge McMillan keeps the strictest of order and there hardly has been a witness or attorney whom the judge has not called down in some manner.

"Members of the jury represent varied professions, with ranching, as might be expected, predominating. They are: J. D. Harwood, Bracketville ranchman; Daniel Pedrotti, Del Rio merchant; H. D. Dick, Knippa farmer; Wilson Bonner, Dryden ranchman; William Paysinger, Batesville ranchman; L. G. Nunn, Uvalde bookkeeper; H. B. Cummings, Reagan Wells farmer; I. Hayes Cavender, Con Can stock farmer; B. H. Dessler, Juno ranchman; Herman Schafer, Bracketville, laundry employee; Harold Davis, Crystal City laborer; and Chester N. Neely, Sabinal mechanic."

The jury was chosen from some thirty residents of the Western District, most of them ranchers and farmers of this area, some representing various businesses. After preliminary addresses to the jury by the attorneys, the lawyer for the plaintiff presented as exhibits the articles published in *Hygiein* for January and February 1938.

TESTIMONY OF EFFIE KELLEY

The first witness, Miss Effie Kelley, stated that she was a newsdealer in the city of Del Rio and that the periodical had been circulated in the town.

TESTIMONY OF A. C. PETERMEYER

The second witness was A. C. Petermeyer, who stated that since April 15, 1938, he had resided in Little Rock, Ark., and before that time, from October 1933 to April 1938, in Del Rio, Texas. He stated that he was a physician and surgeon, licensed in May 1917 in Missouri; by reciprocity in 1918 in Kansas, where he became associated with the Brinkley Hospital in Milford in October 1933. He moved with the Brinkley group to Del Rio, where he remained until removal to Little Rock in 1938. He obtained his license in Texas in 1929. After stating that he had observed the work of Dr. Brinkley during his association, the evidence proceeded as follows:

Q.—Now, tell us, Dr. Petermeyer, please sir, what specialty, if any, Dr. Brinkley engaged in while here in Del Rio? A.—His specialty was dealing more with the infections and hypertrophy of the prostate gland, in conjunction, of course, with the treatment and surgery of other urological conditions. By that I mean urological—I mean the urinary organs, the kidneys, the bladder and urethra.

Q.—And was Dr. Brinkley or not during all of that time engaged in the active practice as a physician and surgeon? A.—He was.

Q.—Was he or not during that time himself performing operations on patients? A.—The majority of them.

Q.—For prostatic trouble? A.—Yes.

Q.—And cases of that nature? A.—Dr. Brinkley was performing practically all of the operations.

Q.—Now, tell us, please, Doctor, what hospitals he has in Little Rock, Arkansas, please, sir? A.—Dr. Brinkley has a hospital at Twentieth and Schiller Avenue in the city of Little Rock, and a second hospital on the Arch Street Pike, about sixteen miles from the city of Little Rock.

Q.—Tell us what the nature of the practice in those hospitals is and what they are operated for, particularly for what purpose? A.—In the two hospitals there are these departments, the urological department, which treats, examines and treats and operates conditions of the urethra, urinary tract, kidneys, bladder, prostate gland, testicles; and the rectal department, where all pathological or disease conditions of the rectum and colon are treated. We have a hernia department where we specialize in the injection treatment of hernia. Those are the three departments that we have.

Q.—Now, how many hospitals? I mean is that all in one hospital? A.—The majority of that work is done at the hospital at Nineteenth and or Twentieth and Schiller. The hospital in the country is used more for our patients who have had work to come back for free examinations and check-ups and to receive additional treatment should any of them be in need of it, but the hospital on Schiller sometimes is filled to capacity so that new patients arriving at that hospital are sometimes taken care of at the hospital in the country.

Q.—Tell us what personnel there is at the hospital there, Doctor, with reference to doctors and help in the way of nurses. A.—At the city hospital Dr. Brinkley and Dr. Osburn are in charge of all the urological treatments and surgery. Dr. H. J. Hilburn specializes in diseases of the rectum; also the treatment for varicose veins and hernia. Dr. Davis is in charge of the physical examinations, Dr. J. H. Davis makes all of the physical examinations of the new patients coming to the town hospital. Dr. Chandler is in charge of the x-ray department and chemical laboratory. Mr. Kirschberg is the laboratory technician. There are two or three more whose names I am not familiar with who are working in the laboratory under Mr. Kirschberg. Mr. Kirschberg is a licensed laboratory technician. At the country hospital Dr. Parnell is in charge of the patients who arrive there for their checkups and treatment. Dr. Hilburn reports there every afternoon to treat rectal and hernia cases. When the city hospital is filled to capacity and new patients are then taken to the country hospital where they are operated by Dr. Osburn. Miss Vira Wederbrook is superintendent of the town hospital. She is the surgical nurse and assistant to Dr. Brinkley and Dr. Osburn. We have a staff of graduate nurses, the names of whom I am not able to give you.

Q.—Yes, sir. A.—But there are twelve or more graduate nurses.

Q.—Now, Dr. Petermeyer, can you tell us who of those doctors were with Dr. Brinkley here in the hospital here? A.—Dr. J. H. Davis, who is examining physician at the town hospital in Little Rock, was also examining physician at the hospital in Del Rio. Dr. Chandler, who is in charge of the x-ray department in Little Rock was also in charge of the x-ray department while the hospital was located in Del Rio; Mr. Kirschberg, a licensed technician, was also in Del Rio.

Q.—Now, Doctor, can you tell us, please, sir, what the extent or volume of the practice of Dr. Brinkley was here in Del Rio? A.—You mean the number of patients?

Q.—Yes, sir. Just give us an idea of the volume of his—and extent of his practice and where they came from while he had his hospital here? A.—While the hospital was located in Del Rio, Texas, patients came to the Brinkley Hospital from every state, practically every state, practically every province in Canada, Alaska, Nova Scotia and Central America.

Q.—Well, were there— A.—The number of patients during that time from October 15, 1933, to January 1, 1938, would be somewhere in the neighborhood of fifteen thousand.

Q.—Now, for what length of time was that fifteen thousand, over what period? A.—From 1933, about October, to January 1, 1938.

Q.—Now, do you know whether or not you had many patients from this general locality in and around Del Rio? A.—Yes, we had more patients from the state of Texas than any other locality.

Q.—A great many more from Texas than other places? A.—Many more.

Q.—And a great—did you or not have a great many patients from the general region around Del Rio, in and around Del Rio? A.—Yes, we had a large number of patients from Del Rio and Val Verde County and surrounding counties.

Q.—Now, Dr. Brinkley has a license to practice in Texas. A.—Yes.

Mr. Brown.—I don't think this gentleman would know about that.

THE COURT.—The license would be the best evidence.

Mr. Morris Jr.—You admitted that in your answer. Do you make any question about his having his license to practice?

Mr. Brown.—We just have the formal objection, if the court please, that this gentleman wouldn't be able to testify to that.

THE COURT.—If there is no issue about it why waste time on it? Is it admitted he is licensed to practice in Texas? We have plenty of issues in the case without wasting time. Is there any admission on that?

Mr. Brown.—No. I just didn't want this gentleman to get out of the general field.

THE COURT.—I think we have lost time by the objection. Go ahead.

Q.—And do you or not know that during all that time he was engaged in the active practice of his profession? A.—He was.

Q.—And is he yet engaged in the practice as a physician and surgeon? A.—He is.

Q.—Did you know anything about the article which was published in *Hygiein*, the article herein sued on, at the time it came out, about that time? A.—Yes, I read it.

Q.—And did you or not have any occasion to discuss the matter or observed Dr. Brinkley with reference to the article? A.—Yes.

Q.—And what affect it had on him? A.—Yes, sir.

Q.—Just tell the jury, please, sir. A.—Well, the—

Mr. Brown.—Your honor, I don't remember if there is any issue as to what effect it might have had on him personally.

THE COURT.—I think he claims he suffered mental anguish.

Mr. Brown.—All right.

Q.—Go ahead, tell what you observed in that connection, just tell the jury. A.—There was a great deal of conversation on the street by the people of Del Rio. A large number of copies were requested from our news stands so that people could read it. The article humiliated Dr. Brinkley in the presence of his friends and acquaintances in Del Rio, as well as with the members of his profession.

Q.—Did it or not appear then to bother and distress him a great deal? A.—It did; Dr. Brinkley was rather reluctant to appear in public after that article was published about him. Naturally it would make any one feel reluctant to appear in public after that.

CROSS EXAMINATION

Questions by Mr. Brown:

Q.—Dr. Petermeyer, what college is it, please, that you graduated from? A.—The American School of Osteopathy and Surgery, at Kirksville, Mo.

Q.—Did they specialize there principally in bone work? A.—No; the curriculum at Kirksville is practically the same as any class A school; the subjects taught and textbooks used are standard ones.

Q.—But it is known as a college of osteopathy, is it not? A.—It is.

Q.—Did you perform the surgery after you came to Del Rio, in Dr. Brinkley's hospital? A.—I was doing the surgery, part of it, when I came, but the majority of it was done during 1936 and 1937.

Q.—That is after you had been here some time? A.—Yes.

Q.—Did you ever do that operation where they take a part of a goat and put it in a man? A.—No.

Q.—Do you operate in the hospital up in Arkansas? A.—No.

Q.—What is the principal type of operation that they do when a man has a complaint, as far as his prostate glands are concerned? How do you operate for that ordinarily? A.—Do you want a complete description of the operation, how it is performed?

Q.—Yes, if you please. A.—After the patient has been accepted for treatment and is in need of treatment to the prostate gland, and all of the preoperative treatment has been performed, and the patient has been prepared properly to receive an operation—I will just give you the technic of the surgeon in the operating room. That is what you want?

Q.—In words we can understand, if you please. A.—The scrotum is anesthetized with apothesine.

Q.—With what? A.—Apothesine, a local anesthetic. The testicle is picked up in the left hand with the index finger of the right hand; the head of the epididymis is an appendage of the testicle; and an incision is made through the skin, through the dartos, through the fascia, through the cremasteric muscle—

Mr. Morris.—Tell us what those are.

Q.—That is just cutting down to get to the testicle? A.—Yes. An incision is made through the scrotum down to the testicle. The testicle is lifted up into the incision so that the epididymis is available.

Q.—Tell us just in language that we may understand better. What is the epididymis? A.—It is a collection, you might say, of tubules attached to the side of the testicle. It has two parts.

Q.—Kind of like an appendage? A.—You might consider it something like that. It consists of a large area known as the globus major and a tail of it known as the globus minor. From the globus minor we have an extension of a tube known as the vas deferens.

Q.—That runs still on up? A.—That runs on up to the seminal vesicles. After the testicle is brought up into the incision so that the—this appendage, the epididymis, can be thoroughly examined, the ducts which lead from the testicle to make up the epididymis are inspected and examined with the examining finger.

Q.—Now, excuse me. I am not very familiar with it, of course. Is there a little space, a little distance between the main bulk of the testicle and where the addition or appendage is? Is there a little space there? A.—Yes, sir, slightly.

Q.—About how much is that, ordinarily, just in a general way, those little tubes, about how long would they be ordinarily? A.—Which tubes are you speaking of?

Q.—The ones reaching from the testicle, that you mentioned, up to the epididymis? A.—They are very short, perhaps 1 centimeter in length after they leave the testicle to where they converge in the epididymis. In fact, the epididymis is so closely attached to the testicle, it is closely attached to the testicle with tissue, but you can feel with your finger the space between the epididymis and the testicle.

Q.—Now, what do you do then in respect—I interrupted you there. What do you do with respect to examining those little tubes? A.—We examine them with the fingers to feel for the presence of small nodular areas, which usually mean infection.

Q.—What do you call those little tubes, technically? A.—The vasa efferentia.

Q—Now, is there another word they use for it, some kind of efferent tubes? A—It is the same thing

Q—Efferent tubes? A—Yes

Q—Now, how many of those, ordinarily, in each testicle? A—Fifteen to twenty

Q—Well, after you have then examined and found which one is diseased, if any, and the condition, what do you do then in continuation of the operation? A—They are ligated

Q—What does that mean, please? A—Tied off

Q—Well, is the number in each testicle in every person always the same? A—They may vary

Q—Do they vary in different people in number, I mean? A—Yes

Q—Well, how many do you tie off ordinarily? A—Sometimes all of them and sometimes half of them and sometimes none

Q—I say ordinarily, an ordinary operation? A—The ordinary operation, seven or eight of them are ligated or tied off

Q—Substantially half of them? A—Yes

Q—Does that tied off mean—does that mean that no fluid or anything can go through that one any more? A—Yes sir

Q—It stops it? A—Yes, sir

Q—Well, if you stop all of them in each testicle, what result would that have? A—Well, on what?

Q—I mean on the man's sexual powers. For instance, what would be the effect of it? A—Sometimes it increases it

Q—To tie them all off? A—Yes sir, all of them

Q—All of the tubes? A—Yes, sir

Q—I mean, now, as to sterility? A—It would produce sterility, but at the same time increase his sexual vitality

Q—What is the difference between sterility and impotency? A—Sterility means that the individual is not able to produce a heavy male sperm, which when it comes in contact with the female ovum will cause a direct cell formation

Q—In other words, he can't have any more children? A—That is right

Q—But that condition can exist and at the same time he would have the ordinary sexual power except for the production of children? A—He could have

Q—But if you cut them all off on both testicles that would produce sterility? A—It would

Q—And in the ordinary operation you cut off about half of them? A—Yes

Q—Of course, that varies in the different patients, I imagine? A—Yes

Q—Now, what else do you do now in addition to cutting off some or all of these little tubes that run between the main part of the testicle and the appendage there? A—The artery running along the vas deferens is also ligated, tied off

Q—That is the blood vessel that runs along the tube that goes on up from the testicle, that goes on up? A—Yes, sir. The vas deferens is picked up and injected with about 5, 3 to 5 cubic centimeters of a 2 per cent mercurochrome solution. This solution is injected through the vas deferens and if the tube is open and functioning the solution will pass on into the seminal vesicles

Q—What is that last you mentioned? A—Seminal vesicles

Q—Yes. A—Small vesicles are located between the rectum and bladder, just above the prostate, and is a sort of reservoir or storehouse for seminal fluid. As it passes upward from the testicles this solution reaches the seminal vesicles, if they are distended with it considerably, and out through the ejaculatory ducts. These two little tubes leading from the seminal vesicles lead to the prostate. In fact, they go through the posterior aspect of the prostate gland, emerging on the floor of the prostate. The solution usually appears the next time the patient voids. At least a part of it does. It does away with the catheterization of the ejaculatory ducts, which are often blocked with infection. If the solution will not pass into the seminal vesicles or if we find the vas deferens is blocked and it presents plenty of evidence of infection we may remove a portion of it

Q—Of what is that? A—Of the vas deferens

Q—Why? A—Because it is like any other focal infection, like the appendix or tonsils or any other organ, if it can no longer function it becomes a menace to the future health of the individual

Q—And you cut out a portion of them? A—Yes, sir

Q—About how long in length is that, ordinarily? A—It may be from an inch to 4 or 5 inches in length

Q—Does that also produce sterility? A—A patient is already sterile, if the mercurochrome will not pass through the patient is sterile

Q—Is that all of the ordinary and usual operation that you do for the condition? Now, what effect—excuse me—what effect does that operation have on an enlarged or diseased prostate gland? A—Research workers and scientists who have been working along the lines of the glandular system have fairly well agreed on the fact that there are two secretions from the testicles. The one secretion, or excretion—

Q—Excuse me please. I meant to say that as far as the enlarged prostate is concerned, the operation you mentioned there whether that will eventually cause the prostate to become smaller, be relieved as far as the passing of urine is concerned? A—That is what I was coming to. I was only explaining it a little more in detail

Q—Yes, sir. Now, then, in reference to—

Mr. Morris Jr.—Let him answer the question

Mr. Brown—You can ask him

Q—If the prostate is enlarged so that it blocks the passage of the urethra do you ever cut a portion of it out? A—If the prostate is enlarged enough to produce over 4 ounces of residual urine—by that I mean the gland is enlarged so much that it will not permit the bladder to empty

Q—Then what do you do? A—A transurethral resection is necessary

Q—What is that? A—That is the removing of the obstructing portion of the prostate

Q—Do you have to make an incision? A—No, the instrument is passed through the urethra and the operation is performed through the sheath of the instrument you use

Q—Now, does Dr. Brinkley's hospital ordinarily charge for—what does it ordinarily charge for that operation? A—Transurethral resection? We usually charge \$250

Q—And for this operation you described first, about the testicle? A—From \$275 up

Q—Does he sometimes give a guaranty after one of these operations? A—We give future service, yes sir, and we guarantee to the patient that if the operations that he has received does not reduce the growth of the prostate gland so he can empty his bladder properly he is privileged to return and have a transurethral resection at no additional expense

Q—Does that cost \$750? A—Yes sir. That also includes his hospitalization and his medications and dressings, anesthetic and operating room fee

Q—You mentioned a while ago a class A medical school. What do you mean by that, please? A—The medical schools are classified, I think A and B, and an A school having a higher rating than a B school

Q—Do you know who it is that classifies the different medical schools throughout the country? A—No

Q—Don't you know, Doctor, that is—that it is a fact that they are classified in that classification as accepted by the American Medical Association? A—I presume so

Q—That is your understanding of it, is it not? A—Yes

Q—Now, up there at the hospital there, as I understand it you are no longer serving as a doctor, but you are the business manager, are you? A—Yes

Q—Do you know of any other recognized doctors in the United States that use the technic of operation that you have here described? A—Yes sir

Q—Who are they, please? A—I do not have the consent to divulge their names, but I can give you one whose article has appeared in literature published by the institution

Q—By which institution do you mean? A—From the Crile Clinic in Cleveland, Ohio

Q—That is the institution that published what, what was it? A—The institution published this article, the article was written by Dr. Lower, who is in charge of the George Crile Clinic

Q—At what place? A—Cleveland, Ohio

Q—You don't want to name any others that do this same operation that you all do? A—Not having their permission to divulge their names I wouldn't care to

Q—All right, sir. Now, as I understood it, you said you operated on about 15,000 people here at Del Rio? A—No, that number of patients came to our hospital

Q—Oh, I see. Well, of that number, how many were operated on, do you remember? A—No, I do not

Q—Do you know what the average charge for the operations was while they were here in Del Rio? A—The average charge would be including their hospitalization and operating room fee and anesthetic and examination. Their entire expense would probably average around \$400

Q—Did Dr. Brinkley or any one in his hospital after they got here to Del Rio, did they ever use the goat gland? A—No

Q—Transplanting the goat gland in a human? A—No

Q—By the time they got here they had quit that, had they? A—There was none of that done here

Q—Are you doing any of that up in Arkansas? A—No

Q—Did you ever do any of that yourself in Kansas when you were there at Milford with the doctor? A—No

Q—Did you ever see any of it done while you were there? A—No

Q—The man that wrote that article up there for the Crile Clinic saying he had done this same operation, did you mean cutting out a portion of the prostate gland or the operation you first described, that is where you tied away the little tubes? A—A ligature operation, yes, sir

Q—That is the one he described in that article, is it? A—Yes, sir

Q—Do you know whether or not that doctor also put the mercurochrome in the tube also, like you do? A—I don't recall

Q—Do you get more patients with this trouble of the prostate from the cold states or warm states, or is there any difference? A—There is a difference, because cold weather affects urinary troubles more than warm weather, and we have a great many patients, of course, from both regions

Q—Also do you get more people from the north of you or south of you, from Little Rock? A—I don't believe there is very much difference

Q—Do you know about how many patients they operate on there now in Little Rock since you have been there, how many they operate per week for this ordinary operation? A—During the past two months I expect the average would be about fifty, between forty and fifty a week

REDIRECT EXAMINATION

Questions by Mr. Morris Jr.

Q—You spoke of the operation when all of the ducts are ligated producing sterility. Do you or not ever perform any operation which might produce or continue a sterile condition in a man without first fully explaining that situation to him and obtaining his consent? A—No we do not

Q—Is that the universal practice in that respect? A—It is

Q—Well, now, is that usual in the case of very old men? A—

Altogether

Q—Now, Doctor, you also told us that a charge of \$750 was made which covers the operation and hospitalization. Does it or not also include the examination which is made? A—Yes it does

The witness then outlined what was said to be the regular physical examination of patients coming to the Brinkley Hospital, beginning with the top of the head and through the body, as is usual in complete physical examinations, describing also the basal metabolic test, the use of the cystoscope, electrocardiograph, and the x-rays. He also described in detail the equipment of the institution, proceeding then as follows

Q—Now, then, Dr. Petermeyer, I want to ask you this question, please sir. Counsel asked you whether any other type of operation was performed and you spoke of the transurethral resection. A—Yes, sir

Q—Will you explain to the jury what that consists of and how that operation is done?

THE COURT—I think he explained that on cross examination

Mr. Morris Jr.—I didn't understand it so

THE COURT—Counsel asked him what it was and he told him what the operation was. Now, you have had this witness on the stand for a long time. If you are going to back track and repeat we will never get through

Mr. Morris Jr.—I wasn't back tracking—

THE COURT—I am not arguing with you, Counsel. That is the ruling of the Court.

Mr. Morris Jr.—Yes, sir. Note the exception

Q—How many different types of operations would you say are done with reference to the prostate, then? A—Aside from our routine prostate operation we do that and also the suprapubic operations. That is operation into the bladder above the pubic bone, openings there are made to remove large stones and growths. We also remove stones by a crushing method.

ment which is introduced through the urethra, through the urinary canal, providing the stone is not too large. The instrument will remove a stone about 3/4 centimeters; that would be about, well, say about an inch or an inch and a half in diameter. The instrument will pick up a stone that size and crush it, and by crushing each fragment separately it can be washed out through a tube or sheath.

Q.—Are there any other operations that are performed, Doctor?

A.—Operations on the testicle, scrotum, penis, kidney, bladder.

Q.—Now, in my questions of you I have intended these questions to apply to the time that this article was published, and let me ask you whether or not your answers to these questions, whether the same answer is applicable to the time which the article was published, as to the various operations and examinations given and treatment? A.—It is.

Q.—And the technic pursued? A.—The same.

Q.—Now, how long, Dr. Petermeyer, have you been observing Dr. Brinkley in the performance of prostate operations? A.—Since 1933.

Q.—And have you or not assisted him during that time with operations? A.—Prior to the time he located his hospital in Little Rock?

Q.—Yes, sir, that is what I say, while he was here in Del Rio?

A.—Yes, sir.

Q.—You assisted him with the operations, did you, Doctor? A.—Yes, sir.

Q.—And did you or not in many other instances in which you did not assist, observe the operations? A.—Yes, sir.

Q.—And can you tell us how many operations you have seen Dr. Brinkley perform for prostate trouble? Just give us your best estimate.

A.—Oh, several thousand.

Q.—Now, Doctor, have any of these patients who have come to Dr. Brinkley originally and received any of these operations, have they returned during the time you have been with the hospital? A.—They have.

Q.—And have you or not had an occasion to examine and observe them prior to their first operation by Dr. Brinkley? A.—Yes, sir.

Q.—And have you or not had occasion to observe and examine them subsequent to the operation? A.—Yes, sir.

Q.—Well, now, just tell the jury as best you can what the practice with reference to the patients is with reference to returning, and approximately how many you would say that you have had the occasion to observe, and how long after they had been to Dr. Brinkley was it that they would come back? A.—From 1933, until January of 1938, I had occasion to examine a large number of patients who came to the hospital, to give them the preoperative treatment and either see them operated by Dr. Brinkley or operate them myself, give them the postoperative treatment and check them out or dismiss them from the hospital at the end of their hospitalization time.

THE COURT.—That wasn't the question he asked you, Doctor. He asked you about those that came back.

A.—Oh, yes. Our patients are privileged to return for checkups, for examination. We want them to, and if they don't return in a certain length of time we frequently write them and ask them why they haven't come back for their examination or check-up. I would say that 5 per cent, about 5 per cent of the patients return for additional work.

Q.—Now, then, after what length of time have they been out, ordinarily, just tell us what varying lengths of time. A.—The time varies from six months to several years.

Q.—Now, then, Doctor, tell us with reference to those patients which you have had an opportunity to examine and observe prior to the time of their operation and subsequent to the time of their operation, what you have found with reference to beneficial effects of the operation given? A.—I would say that 80 to 95 per cent of the patients respond favorably to the treatment.

Q.—Well, now, tell us what you mean by responding favorably, what effect it has, what physical effect? A.—Those who have received our routine operation and treatment for infection or enlargement of the prostate gland?

Q.—Well, I am talking about the gland, what effect you have observed in the way of improvement or benefits received? A.—The benefit has been general. They have been not only able to empty their bladders better and be relieved of their urinary symptoms, but they have felt better and in general way have gained weight and their rest is improved and they sleep better. Many of those who were not able to work at all are able to go home and within a reasonable length of time go back to their job.

Q.—Do you mean by that, then, Doctor, that the operation was successful in those percentages of cases that you have told us? A.—Very.

The witness then described the method by which records are kept in the hospital, after which the evidence proceeded.

Q.—Now, Doctor, please explain to us—counsel asked you about it, about the guaranty. Just what that consists of, what it entitled the patient to, explain that to us? A.—The guaranty, or lifetime future service, entitles the patient to return at any time regardless of time for free examination and check-up. Should we find that he is in need of further treatment we offer it to him at no additional expense. If he needs a transurethral resection, that is performed without any additional expense other than his board and room in the hospital, but he never pays any more for treatment or surgery pertaining to the type of work that he came for.

Q.—Then in these cases, Doctor, is it not true that when they first come you make the complete examination and then the operation or treatment is given and then is the patient also requested to return within six months or a year for an additional check-up and to return regularly? A.—No, he is not. It is not compulsory, he does not have to return, but we ask him to and request that he does.

Q.—Yes, sir, that is what I say, that he is requested to return for additional examination and check-up to see how his general physical condition is getting along, is that correct? A.—Yes, sir.

Q.—And that additional examination and check-up and any further treatment which may develop to be necessary of the prostate is all administered without additional charge, is that right? A.—That is right.

Q.—Doctor, about how long do the patients remain in the hospital after the operation? A.—In uncomplicated cases they usually remain about seven days.

Q.—And how long are they there before the operation? A.—That depends somewhat on the time necessary to make the examination and depends on the condition of the patient, whether or not he is an operative risk at that time. Occasionally we have to keep a patient several weeks, or into the second week or several weeks, before he is operated, and occasionally at that length of time we send him home without any service because we feel he would be a poor operative risk.

Q.—You mean his physical condition is determined by you as such that you feel you could not help him or benefit him with an operation? A.—We feel we could not help him and he might die as a result of the operation from shock or from being in a debilitated condition.

Q.—Because of his debilitated condition? A.—That is right.

Q.—In those cases do you make a charge to the patient? A.—We make a charge of \$50 for the examination plus \$35 a week in the hospital.

Q.—Is that all of the charge that is made to them? A.—We charge sometimes for medications and sometimes we charge just for the examination and their hospitalization.

Q.—Now, with reference to the injections of the mercurochrome solution, Doctor, in the vessels, as you have described it, just tell the jury where that is injected and what is its course?

THE COURT.—No, he has described that, counsel, once.

Mr. Morris Jr.—I want to know the purpose of it.

THE COURT.—If you are going to go over the testimony of every witness like you have on this doctor we would be here too long. I want you to bring this examination to a close. You have brought him way beyond the realm of redirect examination.

Mr. Morris Jr.—Well, it is—

THE COURT.—You will have to comply with the Court's rule.

Mr. Morris Jr.—I wasn't going to ask that question, I was going to ask in connection with what was the purpose.

THE COURT.—He has told why he did it.

Mr. Morris Jr.—Has he explained that?

THE COURT.—Yes, sir.

Mr. Morris Jr.—Note the exception.

THE COURT.—Exactly why they did it, what they did and why they did it. It is going over the same thing twice.

Q.—Is the system of examination and treatment of the patient after you have—as you have given it to us, Doctor, is that the system which was inaugurated and required by Dr. Brinkley in the treatment of prostatic troubles? A.—Yes, sir.

RE-CROSS EXAMINATION

Questions by Mr. Brown:

Q.—Doctor, at any hospital they give a patient a complete examination before they operate on him, don't they, and they take his history?

A.—I think they do.

Q.—And they make a chart of all the patient tells them and of the conditions they have found, don't they? A.—They do.

Q.—Do you know what this formula 1020 has in it? That is Dr. Brinkley's formula, isn't it? A.—Yes, sir.

Q.—Do you know what he has in it? A.—Yes, sir.

Q.—What is that? A.—I haven't his permission to answer that.

Mr. Brown.—We would like to know.

THE COURT.—You will have to answer the questions, Mr. Witness.

Q.—How much do you charge for that No. 1020?

THE COURT.—Wait a minute, they have some objection.

Q.—How much charge is made for that prescription 1020? A.—Of course, a treatment with that intravenous medication we charge \$100.

Q.—Is that the one you have given the patient to take home and have it put in him by his home doctor when he gets home? A.—No.

Q.—Postoperative treatment? A.—No, we give that to him at the hospital.

Q.—The doctor at home doesn't use 1020? A.—Only if he is a recheck patient and does not have time to remain longer.

Q.—But anyway you charge \$100 for prescription 1020? A.—Not for that if he takes it home, if he takes it home there is no charge.

Q.—If it is given in the hospital there is a charge of \$100? A.—Yes, sir.

Q.—What has it got in it?

Mr. Morris Sr.—Of course, this witness says he is an employee of that hospital and this is a proprietary—

THE COURT.—I know, but if he knows it. He is here testifying on the stand. He will have to answer the question.

Mr. Morris Sr.—It is privileged.

THE COURT.—There is nothing privileged about it.

Mr. Morris Sr.—Would it not be privileged in a sense in that it is a matter that belongs to his employer and—

THE COURT.—No, I don't think so.

Mr. Morris Sr.—In other words, a trade secret.

THE COURT.—I don't see any secret. He said he gives it to the patient to take home, and chemists could analyze it.

Mr. Morris Sr.—Note the exception.

THE COURT.—Answer the question if you know.

A.—The chief element in it is hydrochloric acid.

Q.—What per cent of it is hydrochloric acid? A.—I don't know.

Q.—Very small, is it not? A.—No, sir.

Q.—Do you have any idea of the percentage? A.—Perhaps one to one thousand.

Q.—One to one thousand. In other words, one thousand of what, water? A.—Yes.

Q.—One thousand of water and one of hydrochloric acid? A.—Yes.

Q.—Is that all it has in it? A.—No.

Q.—What else has it got in it? A.—Mercury.

Q.—How much mercury? A.—I don't know the percentage.

Q.—What else has it in it? A.—It has methylene.

THE COURT.—Are you talking about now or at the time?

Mr. Brown.—At the time, if you please.

A.—Methylene.

Mr. Brown.—At the time or before?

THE COURT.—You had better make that clear because the evidence shows Dr. Brinkley is running a place up in Arkansas, and we are only interested in what happened down here.

Mr. Brown.—This article was in February of last year, and I am talking about either at that time or a reasonable time before that.

THE COURT.—All right.

Q.—What else has it in it, please? What else had it in it, please?

A.—I believe that is about all.

Q.—How much did you have to pay, wholesale, for that stuff you put in 1020? A.—I don't know.

Q.—Now, do you know what was in these other prescriptions that he prescribed over the radio, prescriptions No. 50 and 60 and those other prescriptions he would talk about over the radio and the person would go to the drug store and get the prescriptions by number so and so? Do you know what was in those prescriptions? A.—No, sir.

Mr. Morris Jr.—We want to object to that question as assuming something not proved. It is a duplicitous question also.

THE COURT.—Yes, it is not in line with anything he asked on redirect examination, I don't think it is proper re-cross examination of any matter.

Mr. Brown:—Yes, sir.

Q.—Do you know what gives that 1020 the blue color to it? A.—The methylene, I believe.

Q.—Now, what pathologist is it there at your hospital, or was it at the time of this article and before, what pathologist was it that made this investigation of the tissues and so forth? A.—Mr. Kirshberger.

Q.—Mr. Kirshberger? A.—Yes.

Q.—He is a doctor? A.—A licensed technician.

Q.—Who licensed him, do you know? A.—Oh, no.

Q.—Do you know of anybody—is there such a thing as a licensed laboratory technician? A.—Well, these technicians who graduate from some of these standard laboratories.

Q.—You don't know who licenses them? Do they get licenses from the state, or whom? A.—I don't know.

Q.—Now, is this Dr. Brinkley's hospital, or was it at the time here and before, was his hospital approved by the American Hospital Association?

Mr. Morris Jr.:—We object to that as being irrelevant and immaterial and having no bearing upon the question.

THE COURT:—Overrule the objection.

Mr. Morris Jr.:—And as being hearsay in its nature, and without any probative force and prejudicial to the rights of the plaintiff.

THE COURT:—If the witness knows I think it is legitimate examination. A.—I don't know.

Q.—Was it approved by the American College of Surgeons?

Mr. Morris Jr.:—The same objection.

THE COURT:—What is the witness's answer?

A.—I don't know.

THE COURT:—He says he doesn't know.

Q.—As I understand it, Doctor, you operated while the hospital was here in Texas, did you? A.—Yes, sir.

Q.—And was Dr. Osburn here at the hospital at that time? A.—No, sir.

Q.—Did he ever work here at the hospital, Dr. Osburn? A.—In the business office.

Q.—But he didn't operate, did he? A.—No.

Q.—But he was the business manager in Texas and you operated, is that right? A.—Yes, sir.

Q.—Then when you moved to Arkansas you changed it there, he operates there in Arkansas and you are the business manager, is that right? A.—Dr. Brinkley and Dr. Osburn.

Mr. Morris Jr.:—We object to that as being immaterial and irrelevant, anything that may be done after the article in question was published.

THE COURT:—I don't know, it goes to the qualifications of these parties.

A.—Dr. Brinkley—

THE COURT:—Just a moment. It goes to the qualifications of these parties, to develop their qualifications. Overrule the objection.

Mr. Morris Jr.:—Note the exception.

A.—Dr. Brinkley and Dr. Osburn.

Q.—Now operate in Arkansas? A.—In Little Rock.

Q.—And you are the business manager? A.—Yes, sir.

Q.—Do you make the arrangements to get the money out of the folks before you do the work on them? A.—No, sir.

Q.—You do it for nothing, without getting any money? A.—The patient pays the business manager of the hospital. I am at the business office and have nothing to do with the collection of fees.

EXHIBITS

The attorney for the plaintiff then presented in evidence as exhibit the issue of *Hygia* for January 1938 containing the first portion of the article entitled "Modern Medical Charlatans," and particularly the portion which read: "In a few spots over the United States, around 1925 to 1930, local stations continued to pour forth filth and falsehood. In the obscure Kansas village of Milford, a blatant quack, one John R. Brinkley, whose professional record reeks with charlatanism of the crudest type, had for some years been demonstrating the commercial possibilities of goat-gland grafting for alleged sexual rejuvenation."

TESTIMONY OF LOWELL BROWN

The next testimony was that of Lowell Brown. He testified that he was tutor for Dr. Brinkley's son and that he made a trip with them to Europe in 1937. He described the conduct of Dr. and Mrs. Brinkley on the boat, stating that they associated freely with the other passengers. He stated also that Dr. Fishbein was a passenger on the same boat. The evidence then proceeded:

Q.—Well, did any of your party associate with the people on the boat, with his people or any of them? A.—Yes, I think Dr. Brinkley's son and Dr. Fishbein's boy played together for two or three days until they knew whose sons they were. In fact, I visited with Dr. Fishbein's daughter and played ping-pong with her a few times, and we drove a golf ball into a blanket hanging on the ship there, and along about the second or third day I visited with her I casually remarked to her if she knew who my boss was and she said no, and I told her and she was interested in asking what kind of man Dr. Brinkley was.

THE COURT:—Counsel, is this competent.

Mr. Morris Sr.:—I don't know where he is leading, your honor. I don't know whether it is or not, but it may be.

THE COURT:—I know, but it seems to be some narration of an episode between him and a girl.

THE WITNESS:—Well, it is—

THE COURT:—Just a moment, Mr. Witness, you be quiet until the Court has colloquy with counsel and confine yourself to answering questions. What do you say about it, counsel?

Mr. Morris Sr.:—I am sure that it would be of no moment unless something came of it. I will ask him this:

Q.—Did that association continue on the trip throughout, or was it terminated, or what? A.—She terminated the conversation rather abruptly. I think we spoke a time or two after that but never associated any more after that.

Q.—Was it or not terminated by you, on your account, or was it terminated because of her?

THE COURT:—Counsel, I don't think that is binding on Dr. Fishbein and I don't think it is relevant unless you can show something with regard to the article itself.

Mr. Morris Sr.:—This was before the article, your honor, this is some time before.

THE COURT:—I know that, but the charge in the article was on the ship they didn't associate with other people. Now you are trying to prove what this tutor here did.

Q.—Now, then, what about Doctor's—was the party composed of the doctor and his wife and son and you? A.—Yes, that is correct.

Q.—You speak of yourself, were you with his son? A.—Yes, sir.

Q.—His little boy? A.—Yes.

Q.—How old is the doctor's boy? A.—Eleven years.

Q.—Well, now, what about Dr. and Mrs. Brinkley on that trip back, did they or not refuse to associate with anybody, or anything of that kind? A.—Just the usual thing, just as I tell you. I could have told you with the other questioning. There was a picture taken, a group picture at the dinner table one evening on the *Queen Mary* going over. I don't believe any picture was taken coming back. I don't know of anything extraordinary about any of our behaviors in any way.

Q.—What do you mean, group picture? A.—Dr. and Mrs. Brinkley and Johnny Boy and myself, and I have the picture at home, and I am sure they do.

Q.—Were they in company with others? A.—Yes, sir, people all around them. Of course, the picture was taken by flashlight of us of the family, and I think the picture will show in the background other tables besides ours. It was in the dining room.

He then stated that Dr. Brinkley was a delegate to the Rotary convention on this trip.

The cross examination follows:

CROSS EXAMINATION

Questions by Mr. Brown:

Q.—Have you ever been with him on any of his yachts? A.—Yes, sir.

Q.—What was the name of the yacht that you were with him on? A.—Well, it was called Dr. Brinkley No. 2.

Q.—Dr. Brinkley No. 2? A.—Yes, sir.

Q.—And where did you go on that occasion? A.—Well, my first yacht trip was up and down the New England coast. I got on the yacht at Port Washington, Long Island.

Q.—Did you ever see yacht No. 1, Dr. Brinkley's yacht No. 1? A.—Yes, sir.

Q.—Have you seen Brinkley No. 3? Is there a No. 3? A.—I think it is also called No. 2, but I have been aboard of it.

Q.—In other words, he has been the possessor of three fine yachts, hasn't he?

Mr. Morris Jr.:—We object to that, it is irrelevant and immaterial and a conclusion and opinion of the witness.

THE COURT:—If you strike the word fine out the question will not be subject to objection.

Mr. Brown:—Yes, sir. What they declared on here is that he has been the possessor of three fine yachts, hasn't he, Mr. Witness?

THE COURT:—They objected to that as calling for a conclusion, whether or not he knows what a fine yacht is. Why don't you confine it to "three"?

Q.—He has owned three yachts, hasn't he? A.—Yes, sir.

Mr. Morris Jr.:—We would make the further objection, your honor; for instance, they may have made some statements in the article which were true. That in no manner, or the proof of the truth of those in no manner relieves or tends to relieve the other.

THE COURT: I know, but they can prove all of their case at one time. Of course, it may be that this line of examination is objectionable, inasmuch as you didn't ask him anything about it on direct examination. However, under the new rules there is the right to recall the witness, and we can save that time here.

Mr. Morris Sr.:—I thought it was a part not charged.

Mr. Brown:—That was charged particularly in the petition, about the yacht.

Q.—The boats that he went back and forth on to Europe were the best boats going and coming, as far as you know, weren't they fine, big ships? A.—He wouldn't be very apt to go in a tub, I wouldn't think.

THE COURT:—Now, Mr. Witness, I want to admonish you. You are supposed to answer questions here, not make an argument. That will be done by the attorneys.

THE WITNESS:—I am sorry.

THE COURT:—Observe the court's ruling.

Q.—That ship, the *Normandie*, that is a big, fine ship, isn't it, Mr. Witness? A.—I think so.

Mr. Morris Jr.:—We object to that as being a conclusion.

Mr. Morris Sr.:—And it is immaterial and irrelevant.

THE COURT:—I think everybody can pretty nearly take notice of the fact that the *Normandie* is a big boat, probably a fine one.

Q.—What was the name of the other one, the one you went over in?

A.—The *Queen Mary*.

Q.—Well, that is a big one and a fine one, too, isn't it, sir?

Mr. Morris Jr.:—The same objection.

Q.—Is that right?

THE WITNESS:—Do I answer?

THE COURT:—Yes, go ahead and answer.

A.—I should think so.

Q.—And on the *Normandie* he had the most expensive and biggest suite of cabins, their biggest ones on the boat, didn't he?

Mr. Morris Jr.:—Just a minute. This witness is not shown to be competent to testify to that.

THE COURT:—What is the materiality?

THE WITNESS:—I wouldn't be—

THE COURT:—Counsel, what is the materiality in that?

Mr. Brown:—They allege that—that is part of the article upon which they allege and are suing us for damages for saying that. We just want to show that it was so.

THE COURT—I believe the article said he travels abroad and returns to this country in the finest suites and finest bonts. Overrule the objection.

Mr Brown—And that is the portion.

Mr Morris Jr—Our objection is the witness is not shown to be competent to testify, and it would be a conclusion and opinion on his part.

THE COURT—About what?

Mr Morris Jr—Whether the most expensive and finest.

THE COURT—If he doesn't know he can say so, but counsel can have him describe the suites.

Q—How many rooms did you have in the suite for instance on the *Normandie*? A—We had two rooms, a room for the boy and I and a room for Dr and Mrs Brinkley.

Q—Were they little butty staterooms where you had to crawl up one over the other to get in bed, or what kind? A—Nice sized rooms. You didn't climb up.

Q—Two beds in them? A—Yes sir.

Q—Or little beds? A—They had small single beds.

Q—Did you have a living room and dining room in that same suite? A—On one of the ships I believe we did.

Q—Which one, the *Normandie*? A—Yes.

Q—And what kind of rooms did you have on the *Queen Mary*? A—Well we had double rooms, a room for the boy and I which had single beds and a room for Dr and Mrs Brinkley which had single beds.

Q—Did you have a living room or dining room, anything like that? A—No.

Q—Those suites on those ships Mr Witesses were handsomely furnished, fine stuff in them. A—I don't know whether I am competent to judge on that.

Q—You know the difference between broken down furnishings and nice ones? A—Things were comfortable enough both ways.

Q—Weren't they handsomely furnished? You know enough about things that you can say whether they were furnished in fine style or not? A—Well, naturally, any first class cabin on a ship of that kind is nicely furnished. In my opinion you couldn't get anything else.

Q—Now, about how long did you work for Dr Brinkley altogether? A—Five years and two months. I believe to be just about exact.

Q—That is, you have been a tutor for his son for that long? A—Yes, sir.

Q—Did you start working for him after he came to Del Rio? A—No sir, I went to work for him in Milford, Kansas, just a few weeks before he came here.

Q—Are you still working for him? A—No sir.

Q—When did you quit? A—December 1st.

Q—Last December 1st?

The witness then stated that he is now in the life insurance business in Council Grove, Kansas.

RADIO BROADCASTS

At this time the court and the lawyers considered the question of the order of the court to Brinkley to produce either transcripts or victrola records of his broadcasts from the station in Mexico. Dr Brinkley stated "I don't know anything about it. I imagine the records prepared in 1938 have all been destroyed. I don't think the station keeps them over two or three months after they are filed over there."

After much discussion about getting the records or transcripts of the broadcasts, the court said:

THE COURT—It seems to me as a practical matter that this should be handled very simply. Everybody knows Dr Brinkley for years has been broadcasting over the radio. I hear it all the time running around in my car. I have always understood and I presume it is true, that he doesn't personally go over and do it that frequently he sends records over there. If that is true why not say so and if he can get the records all right. If we can't we will have to handle it some other way. Why make trouble about it?

Mr Morris Jr—We hadn't intended to make trouble about it. I wanted to explain that to the Court. We hadn't intended to make any trouble about it at all. We just didn't construe—

THE COURT—If they are over there will you try in good faith to get them?

Mr Morris Jr—Yes, sir, we will.

Next came the discussion of the number of depositions which would be introduced by the attorneys for both sides and as to what the court would permit in the introduction of depositions.

Second Day, March 23, 1939

On the beginning of the second day, the plaintiff rested his case, at which time Mr Matthews, attorney for the defendant, introduced a motion for a directed verdict in accordance with the new federal rules that permit the making of such motions at the close of plaintiff's evidence.

Mr Matthews said:

However preliminary to that we would like to call your honor's attention to what we consider to be a contempt of this court and conduct on the part of the plaintiff here requiring that this case be discontinued. On last night the plaintiff in this case Dr Brinkley, over the radio that he regularly broadcasts over made derogatory statements with respect to the defendant in the case mentioning him by name. He made derogatory statements with respect to the American Medical Association and made statements generally referring to and having a bearing upon the case now on trial. In substantiation of that we would like to call Dr Brinkley.

THE COURT—What is before the court about it? Is it your idea that the trial is prejudiced by what he has done?

Mr Matthews—Your honor, it seems to me to broadcast over a powerful radio station one of the parties get on a powerful radio station during the trial of the case, and broadcast over it during the trial is obviously contempt of court.

THE COURT—You make a motion and have him cited and I will hear that separately and apart from the case. If any of the jurors heard the broadcast and were swayed by it that might be grounds for a motion for a new trial.

Mr Matthews—What we want to do is to make a motion in contempt and call this to the attention of the court and ask that a mistrial be declared at this time.

THE COURT—I am not going to declare a mistrial on it unless I am advised that some of the jurors heard or were influenced by it. I don't think it is wise during the course of the trial to stop and go to interrogating the jury about that.

Mr Matthews—I think that is correct, your honor.

THE COURT—And the question as to whether they heard the broadcast and whether they were influenced by it is one that could come up on a motion for new trial, but if I stop now and start trying the jury out on what they heard if anything, and whether it had any influence on them would militate against the trial. The jury ought not to be poked around during the trial of the case.

Now, with regard to the matter of whether the taking of the air and making a broadcast of that kind constitutes a contempt of court and whether civil or criminal I will hear you on that if you make a motion and require them to answer, when this case is over.

Mr Matthews—Now, your honor—

THE COURT—I am not going to attempt to pass on the matter in advance, but I will certainly say to counsel for the plaintiff, who of course should have advised his client, inasmuch as you heard the court admonish the jury to refrain from talking or listening to any one about it and even not to read the newspapers, it is certainly poor judgment to go upon the air with the case during the trial of the case. I don't suppose counsel is responsible for that.

Mr Morris Sr—First I ever heard of it is right now. Of course, we never in any manner anticipated it. We will inquire of Doctor about it.

TESTIMONY OF JOHN R BRINKLEY

Mr Brown, attorney for the defendant, then called to the stand John R Brinkley, the plaintiff. The evidence proceeded as follows:

Examination by Mr Brown

Q—What is your name, please? A—John R Brinkley.

Q—Where do you live now, please, Doctor? A—Del Rio, Texas.

Q—And do you operate a hospital here in Del Rio now? A—Not now.

Q—You operate one, as I understand in Arkansas, Little Rock, Arkansas? A—Two hospitals, yes sir.

Q—Doctor, without stating the exact date, about how long have you been practicing medicine? A—Since 1915, since 1915.

Q—Yes sir. Now when did you first commence to advertise yourself as a doctor? A—I think I began radio talks about our hospital in 1929.

Q—Well had you issued any pamphlets—first, when did you first do the goat gland operation, taking a piece of goat testicle and putting it in— A—I got—

Mr Morris Jr—Just a moment. We object to that as being irrelevant and immaterial to any issue in the case, as being remote, too remote for consideration here, and as not bearing on any issue in the case.

THE COURT—No counsel, I think that if the plaintiff doesn't offer himself as a witness the defense under the rules has a right to call him, cross examine him just as fully as if he had taken the stand on his own account.

Mr Morris Sr—We think so, too.

THE COURT—And that is what they have done. Now, he put the matter in issue here as to his reputation. What he has done his qualifications, all that sort of thing and they are entitled to search it thoroughly. So I overrule your objection.

Mr Morris Jr—I would like to be heard.

THE COURT—I have just heard you.

Mr Morris Sr—May it please the court, there is a matter that I wish we might state to the court, remind the court of. That is, there is no evidence whatever from the plaintiff concerning this matter, except on cross examination they asked plaintiff's witness if during all the time since 1933 that he had been with the doctor any such practice had prevailed, or any such operation, and he said no. The undisputed testimony therefore is that now to go back to some remote time for them to prove the matter of the experiments with the goat glands would be too remote here. It is a question of his practice now.

THE COURT—I don't think so. They have charged Dr Fishbein charged in this article that this man was a quack, engaged in quackery, and I think they are entitled to show anything with regard to his practice that will throw light on the matter. Overrule the objection.

Mr Morris Sr—If it is not too remote. Note the exception.

THE COURT—A man that comes into a libel suit practically puts his entire life in issue.

Mr Morris Sr—We don't think that is correct, your honor.

THE COURT—It is a question of his reputation. If it is damaged, how much it is damaged. Overrule the objection.

Mr Morris Sr—If it is a question of reputation we make the added objection that that is too remote and must be proved also by general reputation and not by specific acts.

THE COURT—All right.

Mr Morris Sr—Note the exception.

Q—When did you first do the operation of taking a testicle out of a young goat and putting in the testicle of a man? A—1917.

Q—And how long did you continue to do that operation? A—Up until the end of 1932, beginning of 1933.

Q—When did you first open, when did you move to Milford, Kansas, and start practicing there? A—1917. Yes, 1917.

Q—1917? A—Yes.

Q—Did you advertise by pamphlets, newspaper advertisements, or any other way before you started broadcasting? A—Yes.

Mr Morris Sr—Will your honor note our exception goes to all this?

THE COURT—If you want to make an objection you had better make it.

Mr Morris Sr—I hate to interrupt.

THE COURT—It is your province to interrupt.

Mr Morris Sr—Anything back of—I mean back of 1930, we would object to as being too remote. That is the objection we make, the objection to this, it is too remote.

THE COURT—Overrule the objection.

Q—You say you started broadcasting, first, in answer to my question, when did you start advertising yourself as a doctor? You said you started broadcasting in 1929. Now, I want to ask you if that is when you started broadcasting, have you advertised yourself as a goat gland specialist before 1929? A—Yes, sir, I advertised myself as a specialist on gland transplantation before 1929.

Q—When did you start advertising? A—I can't be sure. Some where around maybe 1921 or 1922, somewhere around there.

Q—And when did you build a hospital in Milford, Kansas? A—1917.

Q—1917? A—Yes, sir.

Q—Now, in those advertisements did you hold out to the world that the goat gland operation would make a man young sexually again?

Mr. Morris Sr.—Just a moment. May it please the court, that would be the same objection, it is too remote, and for the further reason that it doesn't call for the best evidence or wouldn't be the best evidence.

THE COURT—Overrule the objection.

Mr. Morris Sr.—Exception.

Q—Now, just a minute. In those advertisements that you issued about the goat gland operation from 1917 to 1929 when you started on the radio, did you hold out to the world that that goat gland operation would make a man sexually young again?

Mr. Morris Sr.—Just a minute.

Q—Or words to that effect?

Mr. Morris Sr.—Just a moment.

THE COURT—I have overruled your objection once.

THE WITNESS—I don't remember.

Mr. Morris Sr.—The record wouldn't show any objection to this question. I don't want to interrupt. I wish we might have it under stood that the court would allow us to have an objection to all this same line.

THE COURT—Well, the court has to have an opportunity to rule on whatever is presented. Under the new rules you don't need to take an exception.

Mr. Morris Sr.—If it is a different objection we will make it but otherwise we would not have to.

THE COURT—It is your duty to except if you think anything is improper. It is no reflection on you to except, I mean to object.

Mr. Morris Sr.—I am not speaking about the exception, I am speaking about the objection. I hate to be interrupting.

THE COURT—I don't know any way you can avoid it. It is the court's idea that these parties are entitled to go into this man's professional record, his reputation, both on the issue of any compensatory damages and on the issue of actual damages, also on the question as to the truth of the allegations contained in the article declared on. I don't think they are limited as to time by the last few years.

Mr. Morris Sr.—Well, we think there is a reasonable limit.

THE COURT—For instance, suppose a man has been practicing twenty-five years without a license at all. You could show that if you charge he is a quack, an unethical practitioner.

Mr. Morris Sr.—That is the point we want to be heard on because we think the court is in error on that and that is the very point I want to be heard on.

THE COURT—State it now. What is it?

Mr. Morris Sr.—I will ask co-counsel—

THE COURT—No, counsel, we have to proceed here in accordance with the rules of the court. I will hear you if you want to be heard but don't call your co-counsel.

Mr. Morris Sr.—He has the authorities on it, but I may say this just as a matter of principle. For instance, we know that there is always a limit in time upon which you may inquire. It is a matter, as the court said a while ago, which relates to a question of character or reputation. For instance, we know that if you had a witness on the stand in any criminal case you may in criminal cases in Texas inquire about indictments and such as that within a certain period, but that is limited. If it is more than seven years ago it is too remote, it is too much against the presumption of the law that a person has changed in that respect, and here this charge against him is that he is doing, he is now guilty of this, that and the other, and of course to go back to the days of experimentation would not be proper if they are remote. For instance, I might have tried and lost a case or done most any matter in the way of error, or I might have been incompetent, we will say, and then I might have gained competency in the practice of law, and it is the same way with a doctor, the same way with any and every professional man, and so it isn't proper to go back to a remote time to ask about this here, and moreover, here are the specific things that are charged in this libel, certain statements they made in this article are charged upon, many others are not. They have to be confined to a reasonable period of time and to—and of course—I started to say this, that the proof of the truth of any other allegation doesn't help, I mean any other accusation in the article doesn't help upon this. I do not have in mind right now the style of the United States Supreme case where there is a comment on the fact that it is an old custom to try and certainly a wholly unwarranted one, to try to prove the truth of certain things in the article in justification when the matter to be proved the truth or falsity is the particular portions of the article that are charged. It doesn't matter that he may have told the truth in other parts of the publication go out, and those that are charged upon and nothing else are the ones, so we say that the lapse of time is such that that is too remote and therefore—and that moreover that isn't a part of the charge in this case, and to prove that doesn't disprove the libel which is sued on here, or to adduce testimony with regard to it, and therefore we say that is calculated to simply prejudice the rights of the plaintiff and all that testimony we will say it is calculated to prejudice the rights of the plaintiff, and it is irrelevant, immaterial and incompetent to establish or disprove the allegations in this case, and entirely too remote.

THE COURT—Overrule the objection.

Mr. Morris Sr.—Note the exception.

Q—Doctor I will ask you that question again, if you please? A—I don't remember that I ever sent out any literature specifying I would make an old man young or anything like that.

Q—Did you say in any literature that the goat gland operation would be an aid in impotency? A—Very likely I did.

Mr. Morris Sr.—Now he is asking again what he said in literature, and the literature is the best evidence.

Mr. Brown.—This is the man that had it put out.

Mr. Morris Sr.—That doesn't relieve it.

THE COURT—Overrule the objection.

Mr. Morris Sr.—Note the exception.

A—I can't remember the contents of the literature I mailed out years ago, it would be utterly impossible for me to testify to its contents.

Q—But you do remember, don't you, if you please, in advertising the goat gland operation to the world for ten years, up until 1929, say, when you started on the radio, isn't it a fact you told the people of the United States that if they would let you operate on them with a goat gland it would aid impotency?

Mr. Morris Sr.—The same objection, your honor.

THE COURT—Overrule the objection.

A—Yes, I think I recommended the implantation of goat, sheep monkey glands, as an aid to sexual weakness.

Q—You did that in numerous pieces of literature you put out up to the time you started broadcasting in 1929, did you, Doctor? A—Very likely thousands of them.

Q—It is the fact you did, didn't you, please? A—I mailed out a lot of literature advertising this gland work I was doing, running into thousands of pieces of literature.

Q—And you got back thousands of letters through the mail didn't you, asking about it, before you started on the radio? A—I received a lot of mail, yes, sir.

Q—Now, you quit the goat gland people, as I understand it—when did you quit fooling with the goat gland proposition?

Mr. Morris Sr.—We object to that—when did you quit fooling?

Mr. Brown.—I beg your pardon.

THE COURT—I think the form of your question has an air of levity.

Mr. Brown.—I beg your pardon.

Q—When you discontinued the use of the goat gland operation, when was that? A—1933.

Q—1933. Now, from the time you started in in 1917, up to 1933 how many of those operations, about, did you perform? A—Several thousands of them.

Q—Did you make people pay up money for it, charge them for it? A—No, the—

Q—I don't mean— A—The gland tissue was an adjunct to something else.

Q—When you used the goat gland operation did the patients pay you for that work? A—I didn't sell them an operation for a gland operation alone. The gland was used in conjunction with other work I was doing as an adjunct to other surgery.

Q—Did you charge them for that? A—They paid for the glands and other work at the hospital, it was all together paid for.

Q—Did your literature say that the four phase operation, at the time you had the goat gland operation, that the whole operation, and for the guaranty, you charged them \$750? A—That is right.

Mr. Morris Sr.—Just a minute. We are going to make an objection and move that that be excluded, for all of the reasons we did before.

THE COURT—Overrule the objection.

Q—Well, you say several thousand you operated on. What is your best recollection as to whether that means two or three thousand or five thousand? I don't know what your best recollection as to how many people you operated on when you used the goat gland operation is.

Mr. Morris Sr.—Now, of course, we just have to object to questions that pertain to the goat gland operations.

THE COURT—Well, if you think it improves your situation any do it.

Mr. Morris Sr.—Well, we object to it, if the court please.

THE COURT—It seems to me that you have a good many objections to this kind of evidence. If there is any merit in one, one is just as good as forty, so far as the record is concerned.

Mr. Morris Sr.—We don't want to be put in the attitude of waiving by the failure to object.

THE COURT—I have tried to indicate to you the court's view about the matter. This article, you yourself read all of it and if you haven't read it all the court would have let the defendant read it. He is charged there with a good many more things than you declare on. They go way back into his history in that article and charge him with matters, and the matters are pertinent and relevant to matters now being inquired about and when he alleges he is an ethical practicing doctor and his reputation is being damaged and he has been injured, he puts that in issue, and they are entitled to inquire into it. Now, that is my idea, and that is why I rule the way I do, and I tried to make it clear to counsel. Now, if you want to persist in making these objections it is your duty to do so. If you think it will help, but it isn't helping the trial along any.

Mr. Morris Sr.—We just want it understood we are not waiving our objection to all of this line of testimony.

THE COURT—You can state that in the record, but the court isn't making any agreement with you.

Mr. Morris Sr.—We want it understood, then—

Mr. Brown.—No, we don't like to appear to be permitted by the word understood.

THE COURT—I am not making any agreement at all.

Mr. Morris Sr.—Then we will have to object, and we object to this being too remote.

THE COURT—Overrule the objection.

Q—You said you had operated on several thousand people using the goat gland operation?

Mr. Morris Sr.—The same objection.

Q—Will you please give us a better idea as to what you mean by several thousand? A—Well, I have in mind five or six thousand people.

Q—Five or six thousand people? A—Yes, sir.

Q—And during those years when you were sending out that literature, you sent out thousands of pieces of literature, didn't you, telling people that that goat gland operation, in connection with the operation was a great success?

Mr. Morris Jr.—Now, we object to that because any literature would be the best evidence, and that it is immaterial and irrelevant to any issue in the case, and too remote.

THE COURT—Overrule the objection.

A—Yes, I told them that the operation was a great success, see.

Q—And after using it from 1917, up to 1933, why, you don't tell the goat gland technique any more, do you? A—It isn't necessary to tell the goat gland technique any more, because we have commercial glandular preparations that we can buy on the market and inject to take the place of the glandular transplantation.

Q—The question was you don't use the goat gland operation, haven't you used it since 1933, have you? A—That is right.

Q—Now, when you started broadcasting in 1929—by the way, before you started advertising as a doctor were you a member of the American Medical Association? A—Yes, sir.

Q—And then isn't it a fact that the ethics of that association are opposed to a doctor advertising himself and saying he is the best doctor and that he can cure you? In other words, the ethics of the American Medical Association are opposed to a doctor advertising himself, isn't that correct?

Mr. Morris Jr.—Just a moment. We object to that as calling for a conclusion and opinion of the witness, and not being the proper standard or criterion of what would be proper in the case.

THE COURT—Overrule the objection.

A—My understanding is that the ethics of the American Medical Association are opposed to any form of advertising by any physician.

Q—Yes, sir. Now, after you started broadcasting in 1929 and that was when you operated, then, in 1929, 1930, 1931, 1932, and quit in 1933, the goat gland operation, did you tell the people on those broadcasts during those years, did you tell them about the goat gland operation?

A—No, sir, I didn't.

Q—Not over the radio? A—No, sir, I never said anything about the goat gland operation over the radio on none of my broadcasts.

Q—During the years 1929 to 1933, when you were still using it, did you still put out literature? A—Yes, sir.

Q—Telling about the goat gland operation? A—Yes, sir.

Mr. Morris Jr.—The same objection.

THE COURT—Overrule the objection.

Q—In other words, you advertised yourself and the goat gland operation in printed advertisements, is that right, up to 1933?

Mr. Morris Jr.—Same objection, if the court please.

A—Yes and no. There is some period in there, I don't remember just when it was, when the earlier literature, as I remember it, I am just trying to give you an idea—

Q—That is the literature you put out? A—I know what you are driving at, and I am trying to help you out.

Q—Well, I thank you very much. A—I am not trying to hedge at all.

Q—All right. A—The earlier literature was built around a gland operation and the gland operation was, we will say, the star of the literature, and then the gland operation was minimized and the prostate work for enlarged prostates began to become the star in the literature to where the gland operation in the literature began to take a back seat, if you will pardon me for such a homely illustration.

Q—It had the front seat for ten years or more, didn't it? A—No, not ten years, it didn't have the front seat that long.

Q—What did you say in the literature from 1929 to 1933, when you stopped using the goat gland operation, what did you say in the literature about the goat gland part of it? A—I don't think I said very much about the gland operation at all in the literature. If I had one of the little blue books I used to mail out we could look at it and see.

Q—Is this the one about your health—is this the one you mean? A—Let's see if this is the one I am trying to think about. There is something that I have in mind here that I was trying to point out to you. I think this is what I am getting to.

Q—Is this the one? A—Here is what I am getting to. You see here is the book I am thinking about where all I say about the glands, I discuss it here on page 25 to 26. Gland transplantation, the compound operation is the outgrowth of experiments.

At this point Dr. Brinkley identified the various pamphlets which he has been using from time to time, including those sent from Kansas, pamphlets entitled "Rejuvenation," "The Compound Operation or the Modern Passport to Successful Rejuvenation," the pamphlet entitled "Recharge Your Batteries," the advertisement headed "Every Man Past Forty Should Know the Truth," the pamphlet entitled "The Brinkley Hospitals," the book entitled "The Life of a Man," postal cards used in circularizing patients, also advertisements which had been published in various newspapers.

The testimony then proceeded as follows:

Q—Doctor, are you the most learned physician in the United States?

A—No, sir, I don't think so.

Q—Have you claimed to be the most learned physician in the United States? A—No.

Q—Have you claimed to be the greatest surgeon in the world? A—Maybe some people writing for me have, but I haven't myself.

Q—Well, this chapter in your book here, isn't it a fact chapter nine is entitled "The most learned doctor in America"? A—It may be. It may be what Mr. Wood put in it, that biography.

Q—With the copyright held by your wife's sister? A—That is Wood's conception of it.

Q—Isn't it a fact that on page ten here, or page 110, it says speaking of you, "Dumly he had begun to realize that he was gifted beyond the run of doctors"? Isn't that in your book? A—Maybe, I don't remember.

Q—And here at page 200, doesn't it say "I'm going to show the American Medical Association, and the doctors and people of this country, that John R. Brinkley has more medical knowledge than any of them have shown"? A—I never said it. Probably Wood did.

Q—You are going to disclaim everything that appears in your biography? Are you or not? A—I am.

Mr. Morris Jr.—We object to that as being argumentative.

Mr. Brown—I withdraw that question, if the court please.

Mr. Morris Jr.—His biography.

THE COURT—The question is withdrawn, counsel.

Q—Isn't it a fact on page 203 you said you are going to show "to the jealous organized doctorhood in America that he was more qualified than any of them"? A—No, I never said that. It may be in the book. Wood may have said it, but I never said it.

Q—Page 214, doesn't the book say here, "in his presentation of facts no matter on what subject, he is a student of human nature, a psychologist a mystery showman, as well as one of the world's most learned doctors and surgeons"? Isn't that in your book?

Mr. Morris Jr.—We object to counsel continuously putting into the question "your book."

THE COURT—Let's find out something more about the book, its conception.

Mr. Morris Jr.—It is composed and written by another person.

Mr. Brown—No, I asked—

THE COURT—Let's find out whether it was published under his authority or not, whether he knew about it, whether he ever repudiated it or anything. You haven't gone far enough with it.

Q—Is there a new edition of this book, a later one than this? A—Yes, sir.

Q—When was the latest one published? A—I declare I don't know. About two years ago, I think something like that.

Q—Has it got a blue back on it, has it a stiff back? A—It has a cover on it something similar to this.

Q—Well, hasn't it got a stiff back like an ordinary book? A—No. The one with the blue back is the first edition.

Q—Oh, A—That is the first one.

Q—That is the one which is stiff like an ordinary book? A—Yes, bound in cloth.

Q—Where did the man get the facts from that wrote this book? A—Well, he collected them up from different places. I employed him to write a biography of myself.

Q—I see. A—And I don't know he asked me and he asked my wife, he asked people that were acquainted with us. He went back to North Carolina where I was born and you might say made a research of me, and then he wrote this book.

Q—Have you ever repudiated this book? A—No, I haven't repudiated it.

Q—Did you pay him for his work? A—Yes, sir, I paid him to write it.

Q—Did you read any of it? A—Yes, sir.

Q—Did you read all of it? A—No, I don't know as I have read all of it, but I have read a lot of the book.

Q—And you hired, you employed him to write it for you? A—That is right.

Q—And you paid him for writing it? A—I did.

Q—And you have had how many editions issued, altogether? A—Three or four, I think about four editions.

Q—And you are selling the latest edition of it right here in Del Rio now, aren't you? A—No, sir.

Q—Who is selling the latest edition? A—Nobody.

Q—It is out of print, is it? A—No.

Q—Where could we get the latest edition? A—You would have to get them from the printer, I guess, in Kansas City, Missouri. We don't have any of them on hand here.

Q—Sir? A—I say we don't have any of them on hand here in Del Rio, because we don't do any mailing from Del Rio, you see.

Mr. Brown—Your honor, I think that connects it sufficiently.

THE COURT—How has the book been distributed?

Q—Who has sold the book? A—I gave it away, what was distributed. I never sold the book. The first edition—

THE COURT—You sent it out as an advertisement?

THE WITNESS—No, I just sent it out to people to let them read it. A lot of people write to me and ask me a lot of questions.

THE COURT—All right, go ahead and ask him your questions. I believe the last matter before the court was counsel's objection to your asking him about what was in the book. I overrule that objection.

Q—Doesn't it say in the book on page 310, quoting the "splendid words of Sidney Lanier 'What possible claim can contemporary criticism set up to respect—that criticism which crucified Jesus Christ, stoned Stephen, hooted Paul for a madman, tried Luther for a criminal, tortured Galileo, bound Columbus in chains, drove Dante into the hell of exile and committed so many other impious follies and stupidities that a thousand letters like this could not suffice even to catalogue them'? Of their company is John R. Brinkley." Isn't that in your book on page 310? A—Probably is, yes, sir.

Q—Yes, sir. Doctor, I want to ask you now about some things the book says about the goat gland proposition, about what you claim about the goat gland proposition, or rather operation, as to whether it includes sexual powers, that is what I want to ask you about. Now, on page 95, isn't it a fact that the book says, "in speaking of the goat gland operation, when you first considered, 'it was such an easy field, he knew, for any practitioner to hold out false hopes to a troubled patient, and charge him almost anything. Other doctors had told him how the suckers bite, at any bait, when they are troubled in this vital aspect of their own manhood.' Is that in your book at page 95? A—It very likely is, yes, sir.

Q—Were you the first man that ever did this operation of taking the goat testicle and putting it in the man's testicle? Were you the first man that ever did that? A—So far as I know I was, yes, sir.

Q—Does your book state here at page 101—you remember you operated on two old farmers first, didn't you, two old farmers?

Mr. Morris Jr.—We make the same objection.

Q—At Milford, Kansas—

THE COURT—Overrule the objection.

Mr. Morris Jr.—It is too remote, irrelevant, immaterial and a specific instance rather than a general matter.

A—The first man I operated on was 45 years of age, and I think the second man I operated on was about 38 years of age.

Q—Were they troubled with loss of sexual power. A—Yes, sir.

Q—What effect did the goat gland operation have on them? A—They claimed complete restoration of their sexual powers.

Q—Then did you operate on two people kind of having trouble with their minds? A—Yes, sir.

Q—And the fifth operation, was that on a boy when you passed a barber shop and heard them making fun of the operation? Did you take a young man out and operate on him, or rather did you operate on one of the boys that was there in the restaurant or barber shop? A—I think the third operation was a cashier in a bank that went insane.

Q—I say you had two farmers and then two that were troubled in the mind, and was the fifth one a man around Milford, when they were kind of hugging about the operation? A—Oh, I know who you mean, old Charley Tasine. The boys in the barber shop were kidding Charley, whether he would have an operation or not, and he said he would if he had the money, he would have an operation, and I was coming along, and I said, "You don't have to have any money, come up to the hospital and I will give it to you for nothing."

Q—And you gave it to him? A—Yes, sir.

Q—You took him up and the operation was entirely successful, wasn't it? A—Yes, sir. He was a bachelor and he got married right afterwards, anyway.

Q—Didn't the book say on page 101 that "the man to whom Doc had done this had become a regular billy goat, twice as good as any other man around Milford"? A—That is what he claimed. He was one of these boasting fellows liked to blow off as to his ability.

Q.—About that time you owed some money on your hospital, didn't you? A.—Yes, sir.

Q.—And you hired a publicity agent to come down there and help you advertise, did you? A.—I hired a man that had had experience in advertising to come down there and advise me if there was anything I could do to increase my business.

Q.—Yes, sir, and didn't he ask you, "Well, you are just a country doctor here away out in the country. What has happened here unusual, what has been done here that we can advertise?" Didn't he ask you about that? A.—Yes, he did.

Q.—And finally after your studying around about it didn't you tell him about this seven, I think it was, operations you had performed with the goat gland operation, or whatever number it was? A.—I don't remember whether I had seven at that time—

Q.—I don't mean the number, if you will excuse me, but didn't you tell this advertising man finally, "As far as doing anything different, I will tell you, I have done this goat gland operation"? A.—That is right.

Q.—And didn't he reach over and grab you by the hand and say "Well, we have them, it is worth a million dollars"? A.—He said, "Dr. Brinkley, you have something that is worth a million dollars to you."

Q.—Well, it has been worth a whole lot more than that, hasn't it, Doctor?

Mr. Morris Sr.—That is irrelevant and immaterial.

Mr. Brown.—You say he has been getting the shekels out of the people.

THE COURT.—I think it is a matter of argument. You were asking about the goat gland operation. Sustain the objection.

Mr. Brown.—You sustain the objection?

THE COURT.—To that question, yes.

Q.—The book here on page 155 quotes from you; it says "I began removing several inches of the vas deferens, lymph chain and vas deferential artery, together with a crown suture through the pampiniform plexus located in the epididymis; and in addition to this surgical technique the transplantation of the testicles from the three-week-old Teggenberg goat. Needless to say, the results were astonishing, miraculous." That is in your own words, isn't it, Doctor? A.—Yes, sir, I have seen astonishing and miraculous results, yes, sir.

Q.—Now, I don't mean to go into technical details of it. Let me ask you this. I may have it wrong in my mind. A.—All right.

Q.—Is it a fact that in operating on the goat gland operation, as I understand it, and please correct me if I haven't got it right, you didn't remove any of the testicles out of the man, did you? A.—The ordinary goat gland operation is what you are thinking about, isn't it?

Q.—Yes, A.—Certain ones I took and cut a hole out of the map's testicle and took a chunk out and filled the hole up in the testicle with goat gland.

Q.—Ordinarily you would cut a little flap or slip? A.—Just a pocket to put the gland in.

Q.—Would you put a piece of the goat gland in that little hole? A.—No. A 3 week old goat, I would use a 3 weeks old gland, just take the capsule off of the gland and transplant the whole gland.

Q.—You would put a goat testicle in one man's testicle and another in the other side? A.—Yes, and sometimes put them in the abdominal muscles. There were different locations for them.

Q.—Now, Doctor, we say in this piece that you are suing us about here, one of the things that you are suing us for, it says that the effect of it is that since you started advertising the goat gland operation that you have made lots of money. That is a fact, isn't it? A.—I think that is something we all have to argue about, whether a fellow makes lots of money or not.

Q.—I don't mean whether you have spent it or spent it on expenses or used bad judgment as to what you did with your money, but this says this, it says "he continues to demonstrate his astuteness in shaking shekels from the pockets of the credulous Americans." In other words, that is one of the things you are suing us about, is whether you have gotten lots of money out of the American people, isn't that a fact? A.—Well, it is the way you state it; shaking shekels is entirely different, to my way of thinking, a different expression than "you have made a lot of money by operating on people."

Q.—All right, over here "here is another place that they allege on where it says it has been reported that at some times you have made as much as \$55,000 a week." The evidence assembled indicates that at various times Brinkley has made as much as \$55,000 a week as a result of his various quackeries." A.—I never made anything like \$55,000 a week. I wish I had.

Q.—You stated that you operated on five or six thousand for the goat gland operation, and the main operation was \$750. A.—Yes, but only a small per cent pay \$750.

Mr. Morris Jr.—We object to going into that. It is irrelevant and immaterial to any issue in the case, as to what was made out of it or what profit was made out of that, and we make that additional objection.

THE COURT.—I think the authorities all hold that the entire article is admissible. If you can cull certain parts out and say they are false and libelous, they have the right to put in the whole article for the purpose of seeing the drift and purpose of the entire writing.

Mr. Morris Jr.—Yes.

THE COURT.—And while the fact part may be true wouldn't relieve them from responsibility for that part which is false, still in an effort to show the article is substantially or wholly true, I think they are entitled to take it up entirely. Overrule the objection.

Mr. Morris Jr.—If the court please, we think these matters, other matters, unless they reflect light upon the particular part charged on, are improper to be gone into.

THE COURT.—I know, but the question is the damage this man suffered, that is in the case, and you can't compress it into any narrow confines and get a just trial, and I think that they have put him on the stand and that allows them to do it. They are entitled to go into the matter very fully and ventilate it if they want to, so I am going to overrule the objection.

Q.—Doctor, I am not asking you now about your net income report or your report to the government or anything of that kind, but I want to ask you what was the gross income, the total income of yourself and your wife for the year 1938?

Mr. Morris Jr.—We object to that as being immaterial and irrelevant and improper and incompetent.

THE COURT.—Counsel, I ruled on your matter. You and I have an entirely different conception of the ruling with regard to preserving your record. I think if you make it clearly known to the court that you object to a certain line of procedure and the court overrules you and announces that that line of procedure is to go on, you have done enough. You seem to think you have to get up and make an objection every time a question is asked. I think you had better look at that new rule.

Mr. Morris Jr.—I think this was a different question.

THE COURT.—The point about it is, it is militating against the trial in two ways. In the first place, it is taking a lot of time and, in the second place, it is so breaking up the thread of what is sought to be brought out that the jury and court and everybody else loses the natural continuity of the story, and I am going to ask you to consider that rule and see if you think it is necessary for you constantly to do this. I know the nature of your objection. I told you what the court's ruling is. I have gone to the trouble several times to outline to you my idea as to what I think the course of the trial ought to be. If it is contrary to your idea, why, after having stated your reasons, don't you let it go at that? The record is going to show what has transpired. I don't think it is necessary for you to interrupt every time anybody does anything.

Mr. Morris Jr.—If the court please, we thought this was a different line of questioning, and we think it is because, in the first place, as I understood counsel, it related to 1938. Is that correct?

Mr. Brown.—Yes, sir.

Mr. Morris Jr.—Which was subsequent to the time of the article.

THE COURT.—I don't see the difference. I ruled they could inquire into the money he made out of these operations that were a part of his advertising campaign. The mere fact they confine it to one year doesn't change the ruling. I am going to have to ask you to help the court a little bit. I don't want to appear to be querulous or arguing with you. Still you will have to assist in the trial of this case. Otherwise we will be here too long.

Mr. Morris Jr.—We were under the wrong impression a while ago.

THE COURT.—I know, but there doesn't seem to be any way to get rid of you. Every time I say something it provokes a new argument out of you.

Mr. Morris Jr.—Well, I didn't want to be put in the attitude of waiving any matters, and secondly, with reference to this, we thought it was an entirely different matter and inquires as to his general income.

THE COURT.—That is the fifth time you told me it was a new matter. If you think that is helping us to go forward, I don't see it.

Mr. Morris Jr.—We except to the court's remark.

THE COURT.—All right.

Q.—What was the gross income of yourself and your wife for the year 1938? A.—Our gross income for the year 1938, from all sources—I can't give you the exact figures because my auditors make this out—is around \$810,000 gross.

Q.—Yes, sir. Now, what was your gross income for the year 1937? A.—If I remember correctly, the gross income for 1937 was pretty close to eleven hundred thousand, right at \$1,000,000 gross. Either it was a little over ten hundred thousand or a little under. I just can't remember those exactly, but I have it, of course, at my office in Little Rock. I have copies of my income tax return. That would give the dollars and cents.

Q.—You took a trip one time on a boat to China, didn't you, you and your wife? A.—That is right, yes, sir, in 1923.

Q.—And you had had a great deal of unfavorable publicity in the papers before you took that trip, hadn't you?

Mr. Morris Sr.—Just a moment. We think—

THE COURT.—I think the question is argumentative.

Mr. Morris Sr.—Besides, it refers back to a time in 1920 or '21. I believe he said. It is very, very remote.

Q.—It is a fact that before, just before you took that trip and while on that trip you had a great deal of very unfavorable comments in the newspapers, but—

Mr. Morris Sr.—Just a moment. If so, that would be hearsay and not binding on this plaintiff.

THE COURT.—You can ask him if he had been commented on in the newspapers just before he took the trip. I don't know what you are leading up to.

Mr. Morris Sr.—Let it be understood that we object to it primarily because it is too remote and not an issue in this case and collateral, immaterial and irrelevant.

THE COURT.—Overrule the objection.

Mr. Morris Sr.—And hearsay, of course.

THE COURT.—Overrule the objection.

Q.—It is a fact, is it not, that before you took that trip and when you were on that trip the newspapers commented very widely on you in an unfavorable way? A.—No, sir, I don't think that happened until after I was in China. I think it broke loose after I left.

Q.—Doesn't the book say it was before and the passengers even shunned you on the boat? A.—Oh, Lord, no. Oh, no, the comment about the passengers on the boat was we were guests of the captain of the steamer and there was a certain amount of jealousy due to that.

Q.—You tell about full dress dining with the captain, don't you? A.—Yes, sir.

Q.—Doesn't it say on page 166, "All aboard!" And then it says that "at the very time when he was completing his plans to go to Shanghai, at Dr. Thompson's invitation, to operate on wealthy Chinese sufferers." And then it says "These flaming headlines in every paper against him made it practically impossible for him to secure patients in America." Don't you remember that those newspaper attacks were on you before you left for China? A.—No, I don't think they really got started until after I got over there. I don't think they had.

Q.—All right. Excuse me, A.—I ought to have—I am not trying to dodge the issue, but that is my impression. You will probably have copies of those newspapers, and it will give the dates.

Q.—I just read this part out of the book. Doesn't it say on page 157 "Unfortunately, the provincial-minded Americans on board were jealous at these attentions, and left the Brinkley party pretty much to itself"? A.—That was on account of the captain being so show, and Mrs. Brinkley and setting aside reservations in the picture show, and he ignored the rest of the passengers, and I think they resented so much attention being paid to us by the captain of the ship.

Q.—Now, as to this article in the *Hypocia*, published by the American Medical Association, it is a fact, is it not, Doctor, that the newspapers and magazines of this country on several occasions have commented most unfavorably about you and your work?

Mr. Morris Jr.—We object to that as a conclusion, calling for a conclusion and opinion of the witness, and would not be the best evidence and is irrelevant and immaterial and incompetent to establish any issue in the case, and hearsay.

THE COURT.—This is cross examination here, in effect, under the rule. Overrule the objection.

Mr. Morris Jr.—Note the exception.

A.—I think that what adverse criticism that I have read in the magazines and newspapers concerning me has probably had its basis in statements from the American Medical Association, which they used as an authority in denouncing me.

THE COURT:—Doctor, he didn't ask you that question.

Q.—I asked you isn't it a fact that at different times up to the time that this article was published the newspapers and press of the country have attacked you very severely, you and your work? A.—I don't think the press of the country knows it. The Kansas City Star put on—

Q.—I am just asking you, if you please, about the press of the country. You can say no if you like. A.—I would say no to that, that is the way I would answer that.

Q.—Do you remember what they call the diploma mill scandal? A.—Yes, sir, I do.

Q.—Isn't it a fact that the newspapers of the country in this diploma—what do you mean by diploma mill scandal? What is that, please? A.—It refers to a situation that was existing pretty much all over the United States, and I believe its headquarters were in the state of Missouri. There was some understanding between certain people operating medical schools in the state of Missouri and secretaries of state boards of the various states where that somebody that didn't have the proper qualifications or something like that would buy or get a degree from one of these schools and then by some aid from somebody get by the board.

Q.—In other words, they would get their diploma without studying like they are supposed to do, but by paying in some way, they would get a diploma when they were not entitled to it? A.—Some hocus-pocus, yes, sir.

Q.—That is what you called the diploma mill scandal, wasn't it? A.—Yes, sir.

Q.—And that was pretty widely discussed throughout the country in the newspapers, wasn't it? A.—Yes, sir.

Q.—And in connection with that didn't the newspapers charge you, that you had gotten your license and your diploma in this diploma mill route, that they turned out the diplomas like a mill ground them out?

Mr. Morris Sr.:—We object to that. It is not the best evidence and is hearsay, calls for a conclusion and opinion and not competent to establish any issue in the case and as being too remote and is an improper attempt to show reputation by specific, any specific instance, and show truth by hearsay.

THE COURT:—What do you say about that, counsel?

Mr. Brown:—Well, your honor, just in mitigation I want to show that at former times during his professional career—he is complaining of damages by reason of this article, and certainly we have a right to go into whether the other papers have commented on his standing, in mitigation of the damages.

THE COURT:—All right, overrule the objection.

Mr. Morris Jr.:—Note the exception.

Q.—Isn't it a fact that you became branded from end to end of the land as a diploma mill graduate?

Mr. Morris Sr.:—Just a moment. If the court please, we make the same objection for each and all of the reasons just now given, and the inquiry is not directed as to any particular time and it is in no way shown that it is or could in any way be proved in mitigation, as counsel said was the purpose, of damages in this case because of the remote time and that some other paper may have done, and of course that further calls for a conclusion and is argumentative.

THE COURT:—If these facts be true wouldn't they be entitled to be considered with regard to the motive and intent of the defendant Fishbein in making these charges, as to whether or not he had grounds upon which he honestly believed them?

Mr. Morris Sr.:—I shouldn't think for a moment—

THE COURT:—The authorities have held that.

Mr. Morris Sr.:—I shouldn't think for a moment a publication back in 1920, we will say, whether it was right or wrong, whether slanderous or not, by somebody else could be put in evidence to mitigate damages for a libel published in 1938. I wouldn't think so, your honor.

THE COURT:—Overrule the objection.

Mr. Morris Sr.:—We accept.

At this time a short recess was had, at the conclusion of which the following proceedings were had, in the presence of the jury:

THE COURT:—All right, read the last question.

The reporter thereupon read the last question, as follows:

Q.—Isn't it a fact that you became branded from end to end of the land as a diploma mill graduate? A.—I couldn't say that I was branded from one end of the land to the other as a diploma mill graduate. I know the newspapers carried a lot of articles about me being connected with a graduate of that school.

Q.—That they called a diploma mill? A.—Yes, sir.

Q.—And those pieces appeared all over the country in papers, didn't they, Doctor? A.—I am quite sure many, many papers carried it, yes, sir.

Q.—Isn't it a fact that Henry Ford's Dearborn Independent carried a lengthy attack on you and he called you the dean of quacks?

Mr. Morris Sr.:—The same objection, may it please the court, the same objection.

THE COURT:—Overrule the objection.

Mr. Morris Jr.:—At the same time we make—

THE COURT:—Please observe the rule as to only one counsel.

A.—In 1923—

Mr. Morris Sr.:—Of course, we make the motion as to this and all matters that have preceded it on this question wherein the attempt to get that in under the guise of mitigation, we make the motion first that it be excluded and the jury instructed not to regard it for any purpose, for all of the reasons that we have stated an objection to it, and secondly, that as to each and all of it that it be limited and the jury be instructed so that they may understand that it is limited to the purpose of mere consideration and cannot be had for any other purpose on this than the subject of mitigation.

THE COURT:—Well, I think it is admissible not only from the standpoint of mitigation but it is admissible as going to the good faith of the defendant in the matter, as to whether he actually believed what he was writing.

Mr. Morris Sr.:—Then limited to those purposes—

THE COURT:—If you want it limited that way the court will limit it that way.

Mr. Morris Sr.:—We want it limited only in the event the court overrules our objection, which we consider good, and admits it.

THE COURT:—I will overrule the objection and limit it to those purposes.

Q.—Dr. Brinkley, the Kansas City Star, what town is that published in, Kansas City, Kansas or Missouri? A.—Kansas City, Missouri.

Q.—And what has the daily circulation of the Kansas City Star—what is that circulation, do you know? A.—I think it was 245,000 at that time.

Q.—When you were practicing there in Kansas the Kansas City Star was attacking you in various ways, was it not? A.—Daily, yes, sir.

Mr. Morris Sr.:—Just a moment. The same objection, it is too remote for any purpose here.

THE COURT:—Overrule the objection.

Mr. Morris Sr.:—That is among all of the others.

Q.—Do you know whether the Kansas City Star was read in every state in the union? A.—I don't know what their circulation—I don't know where they went to.

Q.—Yes, sir. They would write up these things, put them on the front page, wouldn't they, the Kansas City Star? A.—Many of their articles were on the front page.

Q.—Now, were the papers at the time of those attacks by the Kansas City Star on you, did the papers of the country have headlines about your alleged fakery, quackery and fraudulent activities?

Mr. Morris Sr.:—Same objection, your honor.

THE COURT:—Overrule the objection.

Mr. Morris Sr.:—Also it is a conclusion and hearsay.

A.—For some strange reason the papers over the country didn't seem to copy these articles out of the Kansas City Star and reprint them. Very few were printed by other papers. I had a clipping bureau to see what distribution there was over the country of those articles at that time, and it seemed it was confined mostly to the Kansas City Star itself.

Q.—Isn't it a fact that the papers all over the country carried pieces about your alleged fakery, quackery and fraudulent activities? A.—I suppose many papers did.

Q.—Isn't it a fact, Doctor? A.—I wouldn't say a fact.

Q.—I don't mean every paper. A.—I don't know the extent. When I say papers all over the country carried it I would be saying every paper over the United States.

Q.—No, I don't mean that, but papers generally? A.—No doubt many papers.

Q.—Carried articles accusing you of being a fake and quack and things of that kind? A.—I think many papers did.

Q.—Yes, sir. In the American Medical Association—what is that, please, what is the American Medical Association? A.—Well, the American Medical Association, I believe, is a corporation incorporated under the laws of the state of Illinois with principal offices at 535 North Dearborn Street, Chicago, and it publishes a weekly medical journal and other publications, including Hygieia Magazine.

Q.—How long have they been— A.—And they publish a medical directory.

Q.—How long has the American Medical Association been in existence, do you know about how long? A.—I don't know whether they were organized in 1856 or 1876.

Q.—Isn't it a fact, Doctor, that most of the regular physicians throughout the United States are members of that association?

Mr. Morris Sr.:—We object to that as being immaterial and irrelevant to any issue here.

THE COURT:—Overrule the objection.

Mr. Morris Sr.:—Note the exception.

A.—My impression is about 80,000 physicians belong to the American Medical Association, and I think the total number of physicians in the United States is somewhere around 140,000 to 150,000. That is what is in my mind. It may be more than that, because I am not in a position to be an expert on how many doctors there would be. That would be for Dr. Fishbein to say.

Q.—You haven't much opinion for the activities of the American Medical Association, have you? A.—In some respects I don't like their activities.

Q.—Do you think most of the men in the association instead of being Christian gentlemen as of old, they are politicians and abortionists, do you think that is what the members of the American Medical Association do?

Mr. Morris Sr.:—We object to that as being immaterial and irrelevant to any issue in the case, as to what he would think.

THE COURT:—Sustain the objection.

Mr. Brown:—We except to the ruling of the court.

Q.—What was your income in the fiscal year 1936? A.—I couldn't tell you that.

Q.—You don't have an approximate idea about it? A.—No, I don't remember what it was.

Q.—Whether it was a half million or a million? A.—I would have to get the information from my bookkeeper.

Q.—You can't remember whether it was a half a million or a million? A.—No, I can't.

Q.—All right. Dr. Brinkley, so that you will understand it, if you please, the first paragraph of the article says this, "He continues—" that you are suing on the part of the article—I will say this so you will understand what I am asking you about in these questions. It says, "He continues to demonstrate his astuteness in shaking shakels from the pockets of the credulous Americans, notwithstanding the efforts of the various governmental departments and agencies." Now, throughout your practice the governmental departments and agencies have tried to stop you from these advertisements, and as far as your license and broadcast is concerned they have been opposed to you, haven't they, the governmental agencies? A.—No, sir, not that I can think of.

Q.—That is the way you want to answer it? A.—Yes sir.

Q.—All right, sir. Well, you had, at one time you had a license to practice medicine in the state of Connecticut, didn't you? A.—Yes, sir.

Q.—The state examining board of Eclectic, the Eclectic board after an investigation and hearing, they revoked your license to practice in Connecticut, did they?

Mr. Morris Jr.:—Just a moment. We object to that as being immaterial and irrelevant and incompetent to establish any issue in the case, and that any order which was made by the board would be the best evidence and that it is incompetent to establish any issue in the case and would be hearsay and incompetent and prejudicial to the rights of the plaintiff.

THE COURT:—Overrule the objection.

Mr. Morris Jr.:—Except.

Q.—It is a fact that your license to practice medicine in the state of Connecticut, after investigation that your license was revoked, was it not? A.—No investigation was made.

Q.—Well, it was revoked? A.—They were revoked, yes, sir, when I was in China. I never was even called before the board or an investigation made. They put out a blanket order and revoked the licenses of every Eclectic doctor in the state of Connecticut, some having been licensed there for fifty years.

Q.—Your license in Connecticut was revoked? A.—Yes, sir.

Q.—You had this radio station in the state of Kansas? A.—Yes, sir.

Q.—Were you operating that station under permit of the United States government? A.—Yes, sir.

Q.—That permit was issued under what they call the Federal Radio Commission? A.—At that time, yes, sir; Federal Communications Commission now.

Q.—Now, how long, altogether, did you operate your Kansas station? A.—It was built in 1923 and I sold it in 1931.

Q.—When did the federal government revoke your radio license or refuse to renew the license of your radio station in Kansas? A.—They refused to renew the license in June 1930.

Q.—June 1930? A.—Yes, sir.

Q.—Now, is it a fact that a reporter for the *Star*, the Kansas City *Star*, that this reporter was a great booster of President Hoover in the Republican convention when Hoover was first elected President?

Mr. Morris Jr.:—I don't see any pertinency, your honor.

Mr. Brown:—I will show it, your honor, in just a moment.

THE COURT:—Unless you can indicate some pertinency to it it seems to be going too far afield.

Mr. Brown:—I want to ask him if he didn't accuse President Hoover himself, after he was President of the United States, of influencing the Radio Commission to revoke his license, showing under our allegation here you have done these things even though the governmental agencies and governmental departments have tried to stop you.

THE COURT:—All right, overrule the objection.

Mr. Morris Jr.:—Note the exception. We move the court now to instruct the jury not to consider these remarks.

THE COURT:—Yes, the jury will, of course, realize that the remarks of counsel are not evidence. You will not consider his remarks as evidence, it is simply made to assist the court in ruling on the objection.

Mr. Brown:—Yes, sir.

THE COURT:—You will be governed by what you hear from the witness stand. Go ahead.

Q.—What was the man's name, do you remember it? He was a prominent reporter on the *Star* that was one of the first promoters of the—of President Hoover's campaign for the presidency. Do you remember the name of that reporter? A.—No, sir, I do not. May I help you out a little bit? I think you are thinking of the managing editor of the *Star*, Mr. Roberts, that was the promoter of Mr. Hoover's campaign. It never occurred to me it was a reporter. I think it was Mr. Roberts, the managing editor of the *Star*.

Q.—He was a great supporter of Mr. Hoover's? A.—Yes, sir.

Q.—Then Mr. Hoover appointed some members of the Federal Radio Commission, did he not? A.—I guess he appointed them all.

Q.—Yes, sir. A.—I think he did.

Q.—Is it a fact that even President Hoover himself, when this controversy came up about refusing your license in Kansas, that he advised the Radio Commission that they ought to revoke your license or influenced the Radio Commission?

Mr. Morris Jr.:—Now, may it please the court, that would be the rankest hearsay.

THE COURT:—I think you would have to show this witness knew it of his own personal knowledge.

Mr. Brown:—I will show that he has charged that in a document which he has—

THE COURT:—Then ask him about that, don't ask him this as a matter of original evidence.

Mr. Brown:—Yes, sir.

THE COURT:—Sustain the objection.

Mr. Brown:—Note the exception.

Q.—Isn't it a fact that on page 229 of your book in reference to when they were having a hearing about renewing your license it was stated, "and the *Star*, as the A. M. A. and everybody knew, was very close to the new president; and, in turn, he held a position of advantage over the Federal Radio Commission." Didn't you state that in your book? A.—Yes, sir.

Q.—And didn't you say "That was the set-up. It was inevitable that the A. M. A. would seek the help of the *Star*. It was inevitable that the *Star* would throw itself enthusiastically into the fight. There are things in history that never see the light of day." McDonald is the name of that reporter I was thinking about. Was there a reporter named McDonald? A.—Yes, sir, that was one of their reporters.

Q.—It is a fact, then, that you claim in the book here that the President himself interested himself with the Radio Commission to get your license revoked, isn't that a fact? A.—Yes, sir, that was told to me by Vice President Curtis, is where I got my information.

Q.—Vice President Curtis told you the President himself had interested himself? A.—Yes, sir.

Q.—And the Radio Commission had a hearing with respect to renewing your license, did they not? A.—Yes, sir.

Q.—And the Radio Commission of the United States government refused to renew your license in Kansas, did they, Doctor? A.—Three did and two didn't.

Q.—But the majority refused to renew your license? A.—Yes, sir.

Q.—Now, you have had a pretty severe contest in reference to the state board or authorities out there in California, didn't you? Didn't you apply for a permanent license to practice in California? A.—Yes, sir.

Q.—You practiced there a few weeks under a temporary license, didn't you? A.—Yes, sir.

Q.—Made \$40,000 there, didn't you? A.—I don't recall what the gross returns were.

Q.—Something like that, wasn't it? A.—I consider it was something like that, yes.

Q.—Then after you came back to Kansas isn't it a fact that you were indicted in California and that they sent the officers out to Kansas to bring you back to California?

Mr. Morris Jr.:—Just a moment. The same objection, that is, the objection that it is immaterial and irrelevant and incompetent to establish any issue in this case, doesn't show any character of wrong upon his part or any character of impropriety or unethical conduct, and it is hearsay.

THE COURT:—What character of indictment was that?

Mr. Brown:—Practicing medicine in conspiracy with another fellow, another doctor, contrary to the laws of California.

THE COURT:—Overrule the objection.

Mr. Morris Jr.:—And the fact that that happened—in other words, an indictment is no presumption of any man's guilt of anything.

THE COURT:—I think that is perfectly true, counsel, but when you are inquiring into the question as to the intent and motives of a party in writing an alleged libelous article, and when you are inquiring into it not only from the standpoint of a basis of compensatory damages, but you accuse him of malice and ask for exemplary damages, you are entitled to put yourself in his place and see what light and information he had that he thought was true that would warrant him in writing this article, and accordingly you are on a different footing. Overrule the objection.

Mr. Morris Jr.:—But we do move that it be definitely understood as not being admissible except—

THE COURT:—As not being admissible for the purpose of proving the alleged indictment, but simply on the question of mitigation and the question of the good faith of this party in writing this article. All right.

Q.—Well, that is a fact, isn't it, Doctor, you were indicted in California and they sent officers back to Kansas to try to take you to California? A.—Yes, sir.

Q.—And you were very much displeased with the activities of the United States government in reference to refusing to renew your radio permit, were you not? A.—Displeased?

Q.—Yes.

Mr. Morris Jr.:—The fact that he was displeased is irrelevant and immaterial.

Mr. Brown:—Your honor, it is under the question of the activities of the governmental agency.

THE COURT:—Whether he is displeased or not, what would that tend to prove? It naturally follows that if he wanted his license renewed and they wouldn't renew it he wouldn't like it, but I don't like the form of your question.

Mr. Brown:—All right the question is withdrawn.

Q.—Isn't it a fact you stated and circulated matter in reference to your contest with the governmental departments—that you state in this book and circulated that California has a legal record for persecution that stinks to Heaven? A.—It probably is in the book, yes, sir.

Q.—"Tom Mooney is still in jail there. The United States has a legal record for persecution that stinks to Heaven." Didn't you put that in about your government with reference to this, and didn't you put that in the book and circulate the book? A.—I think it is in there, and the book was circulated.

Q.—There it is—"The United States has a legal record for persecution that stinks to high Heaven." That is in there, isn't it, Doctor? A.—Yes, sir.

Mr. Morris Jr.:—We move the exclusion of that for all of the same reasons and for the further reason it is shown that the article or book is not written by Dr. Brinkley but written by a wholly different man.

THE COURT:—I know, but the doctor said he paid the man to write it. He read it and has been giving it away.

Mr. Morris Jr.:—He said he read parts of it. He made the statement he never had read it.

THE COURT:—That goes to the weight of the evidence rather than to the admissibility. He is circulating the book, he says he is giving it away. I think that is legitimate examination. Overrule the objection.

Mr. Morris Jr.:—Note the exception.

Q.—Now, after the Federal Radio Commission refused to renew your permit in Kansas you appealed that case to the Court of Appeals of the District of Columbia, didn't you? A.—That is right, yes, sir.

Q.—And that court agreed with the government? In other words, they sustained the action of the board in refusing to renew your permit? A.—Yes.

Mr. Morris Jr.:—Same objection, may it please the court, and for the further reason that nothing of that matter is in the publication which is complained of, nor would it be the best evidence.

THE COURT:—Overrule the objection.

Mr. Morris Jr.:—Note the exception.

A.—The court held with the commission, yes, sir.

Q.—And didn't you print and circulate in this book here throughout the country here that as far as your contest with the government departments was concerned, that the commission and the court ignored all the weight of the evidence, for they were out to get Brinkley? A.—Very likely I said that, yes, sir.

Q.—Now, then, you had a license, of course, to practice medicine in the state of Kansas, didn't you? A.—Yes, sir.

Q.—And was it the board of health of the state of Kansas had a hearing? A.—No, the board of medical examiners is the licensing body.

Q.—Of the state of Kansas, they had a hearing on whether they would revoke your license, to practice medicine in Kansas, didn't they? A.—Yes, sir.

Q.—And you had been practicing medicine in Kansas since 1917, up to— A.—1930.

Q.—Was it in 1930 that they revoked your license to practice? A.—Yes, sir.

Mr. Morris Jr.:—We make the same objection to all that, your honor.

THE COURT:—All right.

Q.—So this board who licenses people to practice medicine in Kansas, they had a hearing in respect to your case, didn't they, Doctor? A.—Yes, sir.

Q.—And after that hearing they revoked your license to practice medicine in Kansas, didn't they? A.—That is right, yes, sir.

Q.—Yes, sir, and after they revoked your license you appealed that case to the Supreme Court of the state of Kansas, didn't you? A.—No, I don't think it went to the Supreme Court of the state of Kansas. I think it went to some federal court.

Q.—Let me see. A.—I don't think it went to the Supreme Court of Kansas. I think it went to the federal court.

Q.—Isn't it a fact that you appealed to the Supreme Court of Kansas after they had revoked your license to practice medicine? A.—I don't think we ever went to the Supreme Court of Kansas after the license was revoked.

Q.—Well, isn't it a fact— A.—Maybe we did, but it runs into my mind that we went into a federal court.

Q.—I will ask you that in just a minute. Isn't it a fact that on page 244 you say "Meanwhile Brinkley's attorney went before the Supreme Court of Kansas and sought to prevent the hearing?" A.—That was before the hearing.

Q.—Oh, excuse me. You claimed that the members of the medical board of Kansas were so prejudiced against you they wouldn't give you a fair trial, isn't that right? A.—That is right.

Q—So you went to the Supreme Court of Kansas trying to have your case heard before somebody else or another board or something of that kind? A—I declare I don't know what went before the Supreme Court, I don't know what we went before the Supreme Court for.

Q—Anyway, you went before the Supreme Court of Kansas before the hearing? A—Yes, sir.

Q—And isn't it a fact that in your book here at 244 you copy what the Supreme Court of Kansas said about your case, and didn't the Supreme Court of Kansas say this, or you said this, "The Supreme Court was hardly impartial in its denial of Brinkley's claim, since it went beyond the charges in purporting to express them, holding that they held that Brinkley was 'an empiric without moral sense, and having acted according to the ethical standards of an imposter, the licensee has performed an organized charlatanism until he is capable of preying on human weakness, ignorance and credulity to an extent quite beyond the invention of the humble mountebank' . . . who was 'fleecing the defective, the ailing, the gullible and chronic medicine takers who are moved by suggestion, and is scandalizing the medical profession and exposing it to contempt and ridicule'?" A—Something like that.

Mr. Morris Jr.—We object to that may it please the court, for the dual reason, first, that it was written in a book which is shown not to have been—he may have authorized it or assented to this man writing his biography and agreed to pay for the publication. That doesn't mean he is the writer or author of it—

THE COURT—I have already overruled you on that question, counsel. Mr. Morris Jr.—All right. Secondly, the other matter is hearsay, and for the further reason it is simply quoting what some other concern said about him.

THE COURT—As I understand it, the comment that counsel was just reading is something that the Supreme Court said, is that correct, counsel?

Mr. Brown—Yes, sir, copied by this man.

THE COURT—And put in this book and circulated by Dr. Brinkley.

Mr. Morris Sr.—Yes, sir.

THE COURT—Overrule the objection. I can't see why if the doctor put it in the book and circulated it himself he can take exception.

Q—Now, since you have been here in Texas, isn't it a fact that the state medical board of Texas filed suit to revoke your license to practice in Texas? A—Yes, sir.

Q—And they filed that suit up in Dallas didn't they? A—No, here in—yes I guess it was Dallas, Dallas, yes.

Q—Now, in respect to this allegation here about the government agencies being against you has the American government itself, Dr. Brinkley, been against you in your desire to practice medicine and your advertisements and your radio talks, has the American government itself been against you? A—Well I wouldn't know how to answer that question.

Q—Well, isn't—don't you claim that the American government itself—well, I will just say here on page 276 of your book isn't it a fact you state, "The American Government itself now came out openly against" him? A—I think I was referring to the State Department, yes sir.

Q—The State Department of the United States government? A—(No answer.)

Q—Now, it says in the article, you see this first paragraph, it says that you are a quack and it said about making money. Then we said in the article that the various governmental departments—that you kept on making money notwithstanding the efforts of the various governmental departments and agencies. Then down here you also state that you have been damaged because the article says that when your radio station was removed from Kansas—don't you say from Kansas—"he departed to Mexico, obtaining a license from the Mexican Government." Now, when you lost your license to broadcast in Kansas, Doctor, it is a fact that you then went to Mexico and made arrangements for the station across the river from Del Rio, isn't it?

Mr. Morris Sr.—Same objection.

THE COURT—Overrule the objection.

A—Yes sir.

Q—And you are now broadcasting from station XERA at Villa Acuna, Mexico? A—Yes, sir.

Q—Just across from Del Rio, Texas? A—Yes, sir.

Q—That is true, isn't it? A—Yes, sir.

Q—Isn't it a fact that "all sorts of efforts have been made to remove him from the air, but apparently without success," that is true? A—All sorts of efforts were made to remove me.

Q—Here is one thing Dr. Fishbein said in the article which you now complain of. He said all sorts of efforts have been made to remove him from the air, but apparently without success? A—Yes, I quite agree with that part of the article. All sorts of efforts have been made to try to close me down put me out of business. I agree with them.

Q—So that is true, isn't it? A—I agree with Dr. Fishbein on that.

Q—Now, the article says—

Mr. Morris Jr.—Just a minute. In connection with that we would like to say "all sorts of efforts, that would necessarily mean by some particular person or individual. The question would be on whose part. If all sorts of efforts have been made by the American Medical Association, by Dr. Fishbein, or at his instigation, why of course then it would perhaps be of some bearing, but if somebody else some wholly independent concern, we just think that that sort of thing, that that kind of statement is a shotgun statement and doesn't show anything about who made all sorts of efforts or at whose instigation, and therefore would have no place in this evidence.

THE COURT—You seem to be in disagreement with your client. He says he is heartily in agreement with it.

Mr. Morris Sr.—I understand, but we are talking about the legal aspect not talking about whether they were made, but it is not shown by whom.

THE COURT—I don't know that I understand what the nature of your objection is what is before the court, but if you are objecting to that last question that was asked and the answer, I will overrule your objection.

Q—Now, in connection with the sentence in the article that you complain of is right now, that is, February 1938, "right now he is not doing much in the way of goat gland transplanting." That is correct, isn't it, Doctor? You weren't doing any at that time, were you? A—I haven't been doing any transplanting since 1933.

Q—So that sentence is correct, "right now he is not doing much in the way of goat gland transplanting." Is that correct?

THE COURT—He answered the question, counsel. Pass on. He answered it.

Q—Now, then, we come to this part here where it says "he reads" the article says, "he reads the symptoms of patients and then by remote control prescribes the pill that they should use." Well, isn't it a fact that people write in to you, ever since you have been broadcasting, they write in to you telling you of their ailments and symptoms and so forth? A—Yes, sir, they write to me but I don't go back over the radio and answer their letters and prescribe for them.

Q—Don't you tell them over the radio what prescription to take? A—No, sir.

Q—Have you ever done that? A—Not since 1930.

Q—Not since 1930? A—No, sir.

Q—Well, how do you then—do you have any prescriptions now that are numbered? A—No, sir.

Q—When did you quit numbering your prescriptions? A—1930.

Q—That is the last time? A—Yes, sir.

Q—Do you sell 1022 now? A—No, I don't sell it.

Q—Do you—A—Unless you can call selling—you come into my hospital and become a patient and I use it on you. I sell it that way, but I don't sell it out through the mail or advertise it to mail to somebody, you send me so much money and I will send you 1020. I don't do that.

Q—When did you quit? Say the folks would write in to you and say "I hurt so and so and my symptoms are so and so," and you would take the letter and read it over the radio on broadcasts and say, "I advise this lady to take prescription No. 50." A—I quit that in 1930.

Q—In 1930? A—Yes, sir. I promised the Federal Radio Commission—we had the hearing in June 1930—that I wouldn't read those letters and prescribe any more over the radio, and I haven't since.

Q—But how many years before 1930 did you do that? A—I only did it for about a period of six months. I began it in the fall of 1929, and the whole thing was over in June 1930.

Mr. Morris Jr.—Now, then, we move the exclusion of that.

THE COURT—Overrule the motion.

Q—Did you ever advertise in any of your literature or say over the radio if the people would send a dollar or two dollars in that you would advise them what was the matter with them and tell them what medicine to take? A—No. I said if anybody wanted a personal letter from me to send two dollars and I would write them a personal letter of advice. I didn't say I would send anything. I had to do that to overcome so many requests. There were thousands of requests wanting me to write them something and it was utterly impossible to do it.

Q—Now, then, here is another line you complain of. "In addition, of course, he has a hospital in Del Rio where he performs some peculiar operations." During that time back there before 1930, when they would write the letters and then you would prescribe over the radio, didn't you have an arrangement with the druggists throughout Kansas where they would have this medicine in the drug stores numbered Dr. Brinkley prescription No. 50? A—The druggist had the prescriptions. I had the druggists in five states, which we would call the primary service area of the radio station. In other words, our trade territory. And these prescriptions were sent to the druggists for their files, so if you came in and said No. 50 the druggist would mix it and compound it according to that prescription. That is the way it was handled.

Q—How many of those numbered prescriptions did you have, do you remember, about? A—It seems to me like they ran somewhere from one to fifty, something like that.

Q—And the people would write in and then you would read the letter over the radio? A—Yes, sir.

Q—And you would say "I advise this lady and people that are suffering like her to go to the drug store so and so," whatever drug store she lived by, "and get prescription number so and so." A—No. 50 or 60 or 70, whatever it was, yes, sir.

Q—And, of course, you got some commission or divided the profits with the druggist, didn't you, Doctor? A—I didn't get a commission. I had an understanding with the druggists that they were to send so much of their total weekly sales to be applied against the weekly broadcast. In other words, if that wasn't done he would be getting it for nothing.

Q—In other words you made some money? A—I didn't make any myself, there was no intention to make money out of it. It went to the station for operating expenses.

Q—Now, the article said you operated a hospital at Del Rio. That was correct, wasn't it? A—Yes, sir.

Q—Now, it said "where he performs some peculiar operations." Well, the operation that you performed on the enlarged prostate, that was different from the standard operation performed for that by the regular doctors, wasn't it, Doctor? A—Well the operations I perform are different from the rank and file performed by the regular doctors. Of course, I do transurethral work—

Q—I just wanted to cover that point. You performed operations here in Del Rio that were different from the regular standard practice, as you understand it? A—Yes, sir.

Q—That was adopted by most of the physicians? A—Yes, sir.

Q—That is true, isn't it? A—Yes, sir.

Q—And the main one of these is what you call the compound prostate operation for elderly gentlemen, that was the main one, wasn't it? A—I call it the surgical technic. It used to be called the compound operation.

Q—And in which it says "He merely injects a little mercurochrome." You did in that operation, in many cases, inject some mercurochrome into the tubes passing from the main sex glands, didn't you?

Mr. Morris Sr.—Just a moment, counsel. He misconstrues the statement the way he words that.

THE COURT—That is a matter of argument. You will have an opportunity to examine the witness.

Q—In some cases of course you would do more than inject the mercurochrome, is that right? A—In all cases I do more.

Q—You do more? A—Yes.

Q—All right. Now, you don't collect from the patients yourself, do you, Doctor? A—No, sir.

Q—You have some manager, business manager, that makes arrangements about getting paid for the work? A—That is right.

Q—And do you usually inquire, ordinarily and usually do you inquire of your business manager to see whether your people can pay or will pay before the work is done? A—Yes, sir.

Q—Ordinarily? A—No, sir.

Q—Most of the time you do the work without knowing whether you are going to get the money? A—I thought you meant did we make inquiry to find out whether the patient had money or not.

Q—No, sir. Here a man comes, he wants to be operated on and you think he is going to be operated on, whether you endeavor, as a business man of course you endeavor to see if you are going to get your money if you operate on that man? A—That is right, yes, sir.

Q—Now, in reference to these—you get a whole lot of letters, don't you? A—Quite a few, yes, sir

Q—And you answer—no, I believe you state now that you don't answer those letters over the radio? A—No, sir

Q—But you develop a lot of your business through the mail by correspondence and letters you get from people and letters you write to them? A—Yes, sir

Q—Now, since you have been in Del Rio you haven't used the goat gland operation, as I understand it? A—None whatever, no, sir

THE COURT—He has been asked about that several times, counsel Don't ask him about that again

Mr Brown—I beg your pardon

Q—You have been using what you call your new surgical technic What did you say awhile ago it was? A—Surgical technic, yes, sir

Q—Now, what has been the result in operating on the prostatic glands by the use of this new technic? Has it reduced the enlarged glands? A—Yes, sir, it does

Q—Isn't it a fact that you claim that it clears the infection out of the entire human body? A—Not the operation itself but by the ministrations of drugs and removal of focal points of infection—

Q—Excuse me—A—Let me explain something to you so you can ask me better questions When we speak of our surgical technic at \$750 that not only refers to a man's prostate gland but refers to dental work and everything

Q—I understand about that A—We take a case to clean him up and we call that our surgical technic guaranteed service for lifetime That is what we are talking about, complete service for the patient for whatever he needs

Q—This book published in 1937, on page 301, don't you claim it greatly increases the sexual powers of men and women? A—Well, the work we do—

Q—No excuse me Didn't the book you published in 1937 say that? A—Probably it did

Q—Overcome depressed mental conditions, that is what you said in the book wasn't it? A—I think so yes sir

Q—Didn't you say in the book, "He has, as a matter of cold sober fact, changed the color of his patient's hair, smoothed the wrinkles out of their faces and turned their complexions from a sickly pallor of old age and disease back to the ruddy glow of health"? A—That is true

Q—Is that true? A—Yes, sir

Q—What is the closest to \$55,000 a week that you ever made? This thing says here it has been reported that sometimes you have made \$55,000 a week What is the closest to that you ever got that you recollect? A—I don't think that I ever exceeded over \$120,000 to \$125,000 in a month

Q—In one month? A—So if we divided that by four it wouldn't be that much

Q—You don't think that Dr Fishbein ought to pay you any damages because he said you made \$55,000 do you? A—

Mr Morris Jr—Just a moment, that is argumentative

Mr Brown—I beg your pardon, your honor

Q—Doctor, you have been the possessor of three fine yachts, haven't you? A—Well I am happy—

Q—I say you have been the possessor of three fine yachts, haven't you? A—I own three yachts yes sir

Q—Well, how many men does it take to run the one you have now? A—It takes twenty-one men

Q—A seagoing yacht? A—Yes, sir

Q—You don't want to say it is a fine yacht, do you? A—The one I live now is a mighty nice yacht, yes, sir

Q—Thank you Now, when you go and come across the seas on your summer trips you go in the finest boats, don't you? A—I try to go on good boats, seaworthy boats

Q—Are there any better boats than the *Queen Mary* or *Normandie*? A—If there were I would have been on them

Q—You go on the finest boats and stop in the best suite on the boats, don't you? A—I try to, yes, sir

Q—Isn't it a fact that for yourself and your wife and tutor and little boy you paid \$1,900 to get from France back to the United States on the *Normandie*?

Mr Morris Jr—We object to that as being irrelevant and immaterial

THE COURT—Overrule the objection

Mr Morris Jr—Note the exception

A—I don't know what I paid the American Express Company I have an unlimited charge account with them, and after the trip was over five or six months later, they sent a statement in to me and my bookkeeper paid the bill

Q—You don't know whether it was \$2,000 or \$5,000, do you? A—No I suppose it was eighteen hundred or two thousand dollars, I suppose, something like that

Q—Well, in traveling across there on the boats do you and Mrs Brinkley talk to the passengers or not? A—Oh, some of them, if we meet them and get acquainted with them, yes, sir

Q—Doctor, the money is still rolling in to you isn't it, and you make most of your money out of the practice of medicine, don't you? A—Yes, my main income is from my hospital work

Q—And the money is still rolling in, isn't it? A—Well, I don't consider it that way

Q—I don't mean rolling in This thing here says rolling in other words, you are still making good money as a physician, aren't you? A—I have a nice practice

Q—Now, when you were here, when you were here in Del Rio you didn't have a separate hospital, did you? Was your hospital in the Roswell Hotel? A—That is right, we used three floors in the Roswell for hospital purposes

Q—Now, how many rooms does that downtown hospital have, the downtown hospital you have in Little Rock? A—Oh, about fifty

Q—How many patients will the downtown hospital accommodate? A—We can squeeze in forty

Q—Yes, sir Was that a two story building or a three? A—Two stories

Q—Was that an old building or was it constructed as a hospital? A—That was St Luke's Hospital, owned by one of the surgeons down there that died, and I bought it afterwards

Q—And then you have another hospital out in the country about sixteen miles? A—Yes We call that the Country Club Hospital

Q—That is an old country club out there? A—No, it was the Shriners' Country Club out there

Q—How many rooms has that got, about? A—You want to know how many patients I can keep out there?

Q—Yes, sir A—So I must tell you we can take care of about fifty patients out there It is in a different arrangement from the rooms at the other place There is a large receiving, reception halls, and dining rooms and dance rooms

Q—Do you own that? A—Yes, sir

Q—How many acres are there there? A—Three hundred and seventy-five

Q—It was at one time used as a country club? A—I want to correct that statement You asked me if I owned it I don't know whether it means anything or not, but at least I want to try to tell the truth That is in a trust estate for my son, and I am the trustee and manage the trust estate Whether that makes any difference in the answer I don't know

Q—Now, those three floors that you say you had, did you have the whole of the three floors in the Roswell Hotel here in Del Rio? A—Well, we had all of the mezzanine floor, and if I am not mistaken I think—I think we had two floors above that, completely to our own use

Q—How many rooms were in there altogether? A—I don't remember We used the mezzanine for administrative purposes and operating room We had our sterilizing equipment and laboratory equipment in the basement

Q—Were any patients on the mezzanine floor? A—No, they were all examining offices and diagnostic offices and treatment offices and operating room and business offices and things like that

Q—Dr Brinkley, under this new technic I understood from Mr Peter Meyer that testified yesterday, that you cut the ducts between the testicle and the epididymis, or the fold, or whatever you call it? A—No counsel, we don't cut, we ligate

Q—You tie it? A—Yes, a linen suture

Q—It is just the same as if you cut it, nothing can come through there? A—As long as the suture is on there the patient would be sterile Take the suture off and he is fertile again

Q—You say about fifteen of those little ducts from the testicles to the epididymis, each testicle has about fifteen Now, when you perform the operation do you tie all the little ducts between the testicle and the epididymis? A—In some cases they are all tied off In other cases only a part of them

Q—Well, didn't you say in your deposition that—that was the name of that case Parnell case, when they took your deposition didn't you say three different times you cut them all you cut all of the efferent ducts, tied them off, excised them, ligated all of the efferent ducts reaching from the testicle to the epididymis? A—If my memory hasn't gone bad on that deposition, I stated we ligated a part of that not all of them and I think the counsel asked me "Well how many," and I said "Probably ten, eight or ten or eleven," something like that

Q—Isn't it a fact in the deposition you said three different times you ligated all of them? A—We do ligate all of them in certain cases, yes, sir

Q—I can show you that, as to how it came up, as to that time Now isn't it a fact that in that deposition when they asked you about it you said "Question Now, what do you mean by ligating those ducts, state that technique to us please Answer Well, it is talking of the fifteen efferent ducts on each side approximately that number, tying off some of the sections of the testicle so secretions can't pass through the ducts to the epididymis I think that is about as plain as I can say what I mean by ligate Question Do you mean tie off with catgut or linen? Answer Yes, sir, we use linen And you sometimes tie off all fifteen of the efferent ducts Question Of both testicles? Answer That is right If you don't do it on both sides you might as well not do it at all Question Well, do you do it on both? Answer Yes, sir Question All fifteen ducts? Answer Yes, sir Question Do you ligate the vas as well? Doctor? Answer No, sir Question That is the main tube that goes on up, isn't it?—excuse me just a minute A—I think I had already answered you

Q—I want to show how you answered in the deposition A—Yes

Q—Doctor, last Sunday night isn't it a fact you offered hundred dollar prizes over the radio to folks that would write the best letter on good health and send it to you and the names of two people that were sick and two people that had enough money to pay their way to Arkansas? A—I didn't specify the number

Mr Morris Jr—Just a moment We desire to make an objection to that isn't a relevant time, that it is not a matter at the time that is in issue

THE COURT—Don't the courts hold these damages, if there are any damages, are not only retroactive but prospective?

Mr Morris Jr—Yes, sir

THE COURT—The extent of the injury not only relates to the present and past but is carried forward to the future

Mr Morris Jr—Yes, sir

THE COURT—Accordingly, it would be proper to inquire as to the present condition, what he is doing, how his business is, and that sort of thing

Mr Morris Jr—We don't think it is proper to go into any matters now that wouldn't reflect upon, wouldn't shed any light on the issue of the damages at all

THE COURT—Well, the general allegation is made as to the lack of ethics and the fact that he is a quack I think what he is doing now would be relevant I will overrule the objection

Mr Morris Jr—Note the exception

Q—That is a fact, isn't it, Doctor? On last Sunday night, substantially, you said you wanted to make a hundred dollar prize, to give it to the one that writes the best letter on health and sends to me the name of two sick people who are able or have money enough to pay their way to Little Rock, Arkansas? A—No, sir, that isn't the way I said it

Q—All right, how did you say it? A—I said "Next Wednesday we are going to divide one hundred dollars in cash into ten equal prizes"

Q—Oh, yes A—What I want you to do is to take one sheet of paper and complete this in twenty words or less I consider good health my most valuable possession because—because what? Complete that in twenty words or less, on a separate sheet of paper send me the names and addresses of men that you are personally acquainted with that you personally know to be sick and in need of our services, physically and financially able to come to see us

Q—Physically and financially able to come to see you where? A—Little Rock, Arkansas

Q—Yes, sir And last night isn't this a part of your radio address last night, "Do you want to participate in the distribution of \$500 cash without your having to send any bottle cap or carton or to buy anything just your intelligence? You are thinking we will listen on the air first This opportunity will close in you, but between now and April 30th there are going to be many men and women receiving distributions" You are

that last night, didn't you, Doctor? A—I never heard the advertisement I don't know a thing about it. All I can answer you about it is I told the announcer to make a contest along similar lines and \$500 would be awarded May 5th.

Q—Who was doing that talking you or— A—I wasn't over at the station, I wasn't over there. I don't know, I guess Mr. Don Howard, the announcer, I suppose.

Q—They didn't use a record of your voice or anything of that kind? A—He may have. Maybe I made a record before I left and went back to Little Rock. I made a record last Monday morning and I think I put on that record—

Q—This \$500 business? A—I believe I did.

Q—All right. And that came over the air last night, didn't it? A—I don't know, I never listened to the station. If you heard it I guess it did.

Q—Then you don't—excuse me. "First prize \$100 in cash, second prize \$50, third prize \$25, fourth prize \$10 in cash, five prizes of \$5 each, and then 290 other cash awards of \$1 each, 299 cash awards. Each entry you send in has 299 chances to win as much as \$100 in cash and listen, folks, it is easy. All you have to do is think just think a little and be real sincere and real honest. Here is the slogan, I consider Dr. Brinkley the world's foremost prostrate specialist because," and that is the blank? A—Yes.

Q—And complete that in twenty words or less on one sheet. That is the idea, isn't it? A—Yes.

Q—That is practicing medicine, isn't it? A—What?

Q—Practicing surgery, is that practicing medicine, practicing surgery, please? A—No.

Q—All right, sir, "and complete that in twenty words or less on one sheet. On the second sheet I want you to be real sincere and know what you are doing. Just mail at least five names and addresses of men that you are personally acquainted with. Be sure you know them, be sure you know they are sick and be sure you know that they are in need of Brinkley's hospital service. Be sure you know, be sure you know that they are physically and financially able to come to see us. Just those five names and addresses on one sheet of paper. You complete the slogan. I consider Dr. Brinkley the world's foremost prostrate specialist because—blank—on a second sheet of paper, and send it to Dr. J. R. Brinkley, Little Rock, Arkansas, this prize ends April 30th and this cash will be distributed May 5th. Now, folks, for your own health's sake, for your wife's sake, for the sake of your loved ones, if such don't neglect to send for the book. Don't sit down there and listen to me and do nothing about it. If undecided, don't know what to do, then listen, then listen to what you can do. Come and see us. I don't mean come see me or come to see the doctors and the nurses, come to see my patients. We have two hospitals full of people. Come in the front door or even in the back. Meet the patients. See what is happening to them. They are just people like you. And then decide what you want to do. Now, that was your advertisement that went out over the radio last night, wasn't it? A—I don't know, whether it went out last night or not, but that is my advertisement, so what difference does it make?

Q—Probably this week? A—Yes, sir.

Q—And you send it out over this powerful radio station right across the river, isn't it? Is that the station it goes over now? A—Yes.

Q—How far will that reach, to Canada and all over the United States? A—It doesn't get into Canada because of a 50,000 watt station at Toronto knocks it out.

Q—Practically all over the United States, is that right? A—Not in the East. The primary service area of the station is a line drawn through Louisiana, Alabama, Georgia, up around through the Carolinas and Virginia and skirting Pennsylvania, a part of Ohio and across along the circular line passing through the Great Lakes and on down to the coast. Of course, now, of a morning when we broadcast the Canada station is not on and the station will reach out all over the United States and Canada, but I suppose you are talking about evening broadcasts.

Q—Doctor, is this kind of advertising, is it usual for practitioners of medicine in the United States to conduct prize contests such as this? A—Not if they want to stay in the American Medical Association.

Q—Excuse me. Is it usual for practitioners of medicine in the United States to conduct these prize contests? A—No, sir, I don't think so.

Q—Do you know of anybody else that is talking over big radios offering cash money? A—No, sir.

Q—Do you know of anybody sending out certificates with red seals on them—give me that—with red seals on them, telling them, if you will come down to the hospital and write the best piece of any ten people we will put a seal on it like a notary seal tell them if they will do that, we will give them an automobile? A—No, I don't know of anybody doing that.

Q—You are the only one doing that? A—As far as I know.

Q—Isn't it a fact that on March 22, this year, that you sent out this broadcast over your station. What is the use of trying to do anything when there is cancer in your prostate gland, because leaving that infection in there for years—there must have been something left out there—what are you going to do about it? You take a risk. Why take a chance? You are sick and miserable. Is your property doing you any good? Is that money doing you any good? Yet you have worked and made money, made property for the purpose of using it when you need it, and when a man and woman is sick is there any time in your life when you need to spend that money more than a time to get your health back? If you don't supply the money you are going to die. You are not going to know health until your body becomes so diseased and so great a sum of money that you can't mortgage the property—that must be left out—A—It is garbled.

Q—Yes, I withdraw it. "That is the picture that some men and women—of some men and women who neglect their lives, poor houses at the end of the road and it might not have been, might not ever have been true if you had acted promptly. That is, don't continue to take treatments that are doing you no good. I believe that by the time the end of this broadcast comes you are going to go and call or mail reservations to come to Brinkley's hospital in Little Rock as thousands of people have done and start life again down that road on the poor house. This is Dr. Brinkley urging you to do it now." There are some portions left out there. A—It is garbled.

Q—That is substantially it? A—Some of it is so and some don't make sense.

Q—Yes, I agree. Did you ever say over the radio, Dr. Brinkley, in effect, "Come to me and don't let your family doctor two dollar you to death"? A—Yes, sir.

Q—How many times have you said that? A—I don't know how many times.

Q—Throughout how many years have you said that? A—I only started that this year. That is a new one.

Q—Is it? How many times have you said it in the last year? That is, "Come to me, don't let the old family doctor two dollar you to death"? A—I didn't say the old family doctor, I said don't let your doctor two dollar you to death. I don't think I said old family doctor.

Q—You didn't want to say that, did you? A—Oh, I wouldn't say that.

Q—Oh, Doctor, now, where do you claim, please, that you got your medical education? A—I had three years in Bennett Medical College, one year in Eclectic Medical College in Kansas City, Missouri.

Q—When did you go to Bennett? Was that in Chicago? A—Yes, sir, I matriculated in 1908 and left there when the junior year was over, about the 1st of June 1911.

Q—Did you go to one right after the other? I mean no skipping there, three solid years? A—1908 to 1909, the freshman year solid, 1909 to 1910, sophomore year, was solid, and from the fall of 1910 to 1911 I missed about six weeks of the first part of junior year and didn't get back into school until some time, I think, around the early part of November.

Q—Now, where were you during those six weeks that you missed? A—Telegraphing in New York.

Q—For whom were you working? A—Western Union.

Q—Do you remember what months those were? A—I went down to New York—I think I went down from Montreal, I was telegraphing in Montreal, and I left Montreal, I think it was around September, and went down to New York and resumed work for the Western Union there until some time in November.

Q—About how long had you been in Montreal? A—I went to Montreal when I got through with my sophomore year in the summer of 1910, and I spent the summer up there.

Q—And then you missed, you say, some of the fall term, about six weeks? A—Yes, sir.

Q—And then you completed your junior year at Bennett College at the end of the spring term? A—Yes, sir, in 1911.

Q—And when did you go to this Kansas City Eclectic College? A—1914 to 1915.

Q—So you skipped how many years in there between the Bennett College and the Eclectic College? A—Well out of school in the summer of 1911 and not back in school until the fall of 1914. That was three years.

Q—And during that time what were you doing? A—During the summer of 1911 and fall of 1911 I was practicing medicine in western North Carolina where I was born and raised, by permit of the secretary of the medical board, who knew I was an undergraduate. Practiced there until some time, I think it was in October of 1911, going down to Jacksonville, Florida, for a couple of weeks, where I worked for the Western Union Telegraph Company, and left there and went to Whiteville, North Carolina.

Q—When was that do you remember? A—Well, I think I went to Whiteville, I think I landed in Whiteville right close to the end of 1911. I can't be sure.

Q—Yes, sir. A—And that has been so long ago, twenty, nearly thirty years ago. I am trying to give you approximately.

Q—All right, sir. A—And some time in there some place I left Whiteville, I don't remember when, I can't remember when I was there, and I went up to St. Louis, Missouri, and stayed around there for a short time and came on back to Tennessee, went to Danrich, Tennessee, practiced medicine at Danrich during the summer of 1912, the summer of 1912 I was practicing medicine at Danrich Tennessee. During the fall of 1912 I moved down to Knoxville, Tennessee and I practiced around there somewhere toward the close of 1912 and the beginning of 1913, some time during the beginning of 1913—

Q—Now, you didn't have a regular license at that time, as I understand it? A—I had a license, undergraduate's license.

Q—All right. A—I had an undergraduate's license in Tennessee. I was practicing legally.

Q—Did you ever work and practice down at Greenville? A—I opened an office there for another man. I never practiced there, never have practiced there.

Q—What was the man's name? A—Mr. Burke.

Q—What was your partner's name in that venture? A—His name was Crawford.

Q—Isn't Burke and Crawford the same man? A—No, Mr. Burke was the owner of a chain of medical offices over the country.

Q—What kind of diseases did that chain treat? A—Treated two, gonorrhea and syphilis.

Q—Now, when you were there at Greenville, that institution you opened up at Greenville, they had paid ads in the paper advertising they would treat gonorrhea and syphilis, didn't they? A—I can't remember.

Q—What was the name of the institution, the branch office you opened up at Greenville? A—The Electro Medic Specialists. I think that is the name of it.

Q—Do you remember whether—do you remember whether you did any advertising there? A—Oh, yes, there was many newspaper advertisements run.

Q—Electro Medical Doctors? A—It might have been doctors.

Q—Where was the store located? A—You mean the office?

Mr. Morris Jr.—Just a minute. It seems to indicate that this was not advertising Dr. Brinkley, he was not—this was advertising of some body else, where he simply went to open the place of business for him, so it isn't a question of what the advertisements say for the other doctor, or some other doctor. We think that that wouldn't have any bearing here, and besides it is far too remote.

THE COURT—Overrule the objection.

Mr. Morris Jr.—Note the exception.

Q—Well, it is a fact that you went down there to Greenville even while just a student doctor, before you ever got your diploma you went down there to Greenville working for a man that had a chain. Was that fellow Burke a doctor? A—No, sir.

Q—And he had these offices in different towns? A—Yes, sir.

Q—And they treated gonorrhea and syphilis? A—That is right.

Q—You went down there and opened up to start the office for him in Greenville, North Carolina? A—South Carolina.

Q—And when you opened up and got ready to start, isn't it a fact you put big ads in the newspaper that you were opening up this office for the treatment of gonorrhea and syphilis? A—I know advertisements were run in the paper announcing the opening of the office. That is what my business was, to advertise the opening of the office.

Mr. Morriss Sr.—In connection with that we want to make certain objections. I guess your honor wants to quit now.

THE COURT—You have made your objection and it was ruled on. Mr. Morriss Sr.—There is further matter coming on. We will try to find out just what it is.

THE COURT—We will take a recess.

At this time a recess was taken until 2 p. m. of the same day, at which time the following proceedings were had, in the presence of the jury.

Questions by Mr. Brown

Q—Doctor, when we closed just before dinnertime you had started to say—you had stated that you went down to Greenville and opened up a branch there for Mr. Burke and that office was going to treat gonorrhea disease and syphilis and then the question was asked you and I don't think it was answered, whether you had put ads in the paper when you opened up that office there advertising the office to treat gonorrhea and syphilis. A—I can't remember the contents of the ads, but I know there was many ads running in the newspapers announcing the opening of the office.

Q—And did you practice there in connection with that? A—No, sir.

Q—Now what kind of a degree or diploma did you get when you say you got three years? A—The Bennett College in Chicago and one year at the Eclectic College.

Q—And where was that? A—At Kansas City, Missouri.

Q—And what kind of a degree or diploma did you get from the Eclectic College at Kansas City? A—A degree of M. D., Doctor of Medicine.

Q—Doctor of Medicine? A—Yes, sir.

Q—Did it state on there whether it was an Eclectic College, or not or an eclectic degree? A—That was the name of the university, the Eclectic Medical University that was the name of the school.

Q—What does that mean eclectic? A—It is a word meaning to select the best. I believe that is the literal translation of the word select the best.

Q—Isn't it a fact that Arkansas is the only state in the Union now that will issue a license to practice medicine when a man has gotten a diploma from an eclectic college? A—I don't know.

Q—Do you know of any other state besides Arkansas that will let you practice if you have graduated from an eclectic school? A—Oh, yes, I think you can go before many medical boards and get a license to practice.

Q—Just upon your degree or diploma? A—You would have to take the state board examination.

Q—Have to take the examination? A—Yes, sir.

Q—Now, when you graduated from the Eclectic College of Kansas City it is a fact, isn't it, that the whole class went at one time down to appear before the Eclectic Board in Arkansas? A—I know most of us went down, but I don't know whether all went down or not, I don't think all went.

Q—Practically all? A—The majority of them did.

Q—Did one of the professors go along with them? A—Yes, sir.

Q—And there they were admitted to practice medicine in the state of Arkansas? A—They passed the examination, yes, sir.

Q—That examination was before what is known as an Eclectic Board? A—Eclectic Medical Examination Board, yes, sir.

Q—Now, in reference to your licenses to practice medicine I don't think you answered the question as to whether you had a temporary license to practice medicine in California? A—Yes, sir.

Q—And then you applied for a permanent license to practice medicine in California didn't you? A—Yes, sir.

Q—Did you make an application to practice—that was refused? A—Yes, sir.

Q—Did you make an application to practice medicine in the state of Illinois? A—Yes, sir.

Q—Was that refused? A—Yes, sir.

Q—As late as 1938 isn't it a fact that you again applied to the state of Connecticut to practice in Connecticut? A—In 1938.

Q—Yes, sir. A—No, sir.

Q—Within any recent years have you reapplied for a license to practice in Connecticut? A—No, sir.

Q—My information may be incorrect. A—You are wrong there.

Q—Since your license was revoked in Connecticut you never have reapplied? A—No, sir.

Q—Lately have you reapplied to any other state to practice medicine? A—No, sir.

Q—When were you first married, please, Doctor? A—1907.

Mr. Morriss Sr.—We just say that anything of that kind is incompetent, irrelevant and immaterial to any issue in this case, to ask when he was first married and we can see no pertinency of the inquiry here and we shall object to all testimony along that line.

THE COURT—I think a general background from the witness and the plaintiff would be admissible.

Mr. Morriss Sr.—We think it would not be admissible on any ground and it is a matter that can't be legitimately used for any purpose, and the only purpose for which it could be used would be an improper one, and therefore, we shall object to it and all testimony pertaining to it.

THE COURT—Reference is made to the family in the article that the suit is on. I will overrule the objection.

Mr. Morriss Sr.—Note our exception.

Q—When were you first married, please? A—1907.

Q—And who did you marry? A—Sally White.

Q—Now, when did you marry your present wife? A—1913.

Q—And what was her name, please? A—Minnie Jones, Minnie T. Jones.

Q—That was in 1913? A—Yes, sir.

Q—And did you get a divorce from your first wife? A—Yes, sir, I did.

Mr. Morriss Jr.—We make the same objection to all of that, if your honor please.

Q—When was that? A—In the early part of 1913.

Q—Was that a citation by publication? A—Yes.

THE COURT—Counsel, I don't think there is anything gained in trying out the divorce case.

Mr. Brown—I am not going to do it, your honor.

THE COURT—It is not an issue here. I think it is all right to show the constituents of his family and the effect the article might have had on him, but any questions as to the rights or wrongs of the divorce case—I don't know what they are, but I am not going to inquire into that.

Q—Did you remarry your present wife? A—I did.

Q—In what year, please? A—In 1915 or 1916, I forget which.

Q—Now, your first wife, did she get a divorce from you or did you get a divorce from her—you say she got one from you too?

Mr. Morriss Sr.—That is objected to.

THE COURT—What is the materiality of that?

Mr. Brown—Just to show the whole picture of it, your honor.

THE COURT—Yes, I know, but the picture may be too broad, and take too long and I don't see that we are interested in that, that is not an issue in this article, and outside of showing what the constituents of the family are and who they are, why, I don't think it is material to go into the question of the divorces.

Mr. Brown—We except to the ruling of the court.

Q—Now, when you were down there in Greenville and opened up that office there, weren't you charged with forgery and practicing medicine without a license? A—No, sir.

Q—Weren't you arrested there for something?

Mr. Morriss Sr.—We object to that for all of the reasons. That is going back to a period, we assume from the inquiry, to 1911.

Mr. Brown—1913.

Mr. Morriss Sr.—Well, 1911 to 1915, and the Doctor said he had been practicing with irregularity since 1915, and we say it is immaterial and irrelevant and too remote and that it is not the best evidence and that it is of a nature calculated to prejudice his rights without any rule of law which would admit it, and it is not a proper matter of impeachment.

THE COURT—I will overrule the objection.

Mr. Morriss Sr.—Note our exception.

A—No, sir, I wasn't arrested there. I was arrested in Knoxville Tennessee on a charge that was brought down there.

Q—What were those charges, please? A—I don't know what the charge was, but I know that this fellow, Crawford—

Q—Excuse me, but I understand about that. Isn't it a fact that down at Greenville they charged you with forgery and practicing medicine without a license? A—Not to my knowledge, I don't even know what the charge was.

Q—Did they take you back to Greenville? A—I voluntarily went back.

Q—Were you in jail there for any time? A—No, sir, I didn't stay in jail while I was at Greenville, I stayed—

Q—At the sheriff's house, or something? A—Yes, sir, at the sheriff's house about forty eight hours, and I paid off these bad checks that this fellow had written.

Q—And your lawyer's name was Burke? A—I don't remember.

Q—And the man with you, he was named J. E. Crawford? A—Yes, sir.

Q—And did your father put up the money for these checks or your father in law?

Mr. Morriss Sr.—We object to that.

THE COURT—I think that is immaterial.

Mr. Brown—I just had this in mind, it is shown that he is charged with forgery and we just want to show that his family rustled up the money and paid the fellow that had the checks and they never did prosecute the checks, and that is as to why it wasn't concluded with a conviction or otherwise and that is what we had in mind.

Mr. Morriss Sr.—We will ask the court to instruct the jury not to consider the improper remarks of counsel.

Mr. Brown—I just wanted to tell the court what I had in mind.

THE COURT—Yes, sir, but you must not in telling the court attempt to testify yourself until the court has an opportunity to rule on those matters. I will sustain the objection to the question as asked and I will instruct the jury to disregard the remarks of counsel as they are not competent.

Mr. Brown—We except to the ruling of the court.

Q—Now, when you were up there in Milford, Kansas did you plead guilty to a liquor case? A—I did.

Q—Did you pay a fine? A—I did.

Mr. Morriss Sr.—The witness answered before we could make the objection, and we didn't anticipate it. We make the same objection as to that.

THE COURT—Isn't that charge made in the article?

Mr. Morriss Sr.—It is not a charge in issue.

THE COURT—The entire article is in evidence in the first place, and in the second place the question as to this man's reputation and the damages sustained, if any, by this article that is issued here—all of these matters that tend to show what his history and record are go to make up his reputation, and for that reason it is admissible in evidence and for that reason I will overrule the objection.

Mr. Morriss Sr.—We except to the ruling.

Q—Were you arrested up in Kansas for shooting a man or shooting at him, or something of that kind—had a shooting scrape?

Mr. Morriss Sr.—Same objection.

THE COURT—I understand.

A—No, sir, I didn't get arrested for shooting at a man.

Q—You were arrested in some kind of a fight or shooting scrape?

Mr. Morriss Sr.—We make the same objection. There is no indication on earth who was right or wrong.

THE COURT—Overruled.

A—This fellow had me put under a peace bond because I made some remarks concerning him that caused him to be afraid, I guess, and they put me under a peace bond, I don't know whether I was arrested or not, but I had to give a bond to not shoot him.

Q—As to the different specialties that you followed back there in Greenville, North Carolina you were there, as I understand it, working as a doctor in venereal diseases, gonorrhea and syphilis, is that right?

A—I wasn't working at all, we were just getting the office opened up there and that was the kind of office it was going to be.

Q—And then you have advertised that you can treat cancer? A—No, sir, I haven't advertised that I treat cancer.

Q—That you had a cancer cure? A—No, sir. What you are referring to is some experimental work that I was carrying out.

Q—A cure on cancer—a cure for cancer? A—Following the line of reasoning of Maud Slye of Chicago.

Q—Have you advertised that your treatment that you have given in your practice will benefit cancer? A—No, sir.

Q—You haven't? A—No sir

Q—Do you advertise that your treatment benefits insanity, Doctor?

A—I haven't advertised in that sense, but I have reported cases of insanity that I have treated that have later recovered

Q—And, then, of course, you have many of these advertisements that your treatments aid in sexual rejuvenation, haven't you, Doctor?

A—Yes, sir

Q—We went over that this morning? A—Yes, sir

Q—Now, your main specialty is the treatment of the prostate gland, is that right? A—Yes, sir, the enlarged and infected prostate

Q—Doctor, this prescription 1020 that you treat your patients with, when you sell that prescription how much do you get for it? A—I don't sell it in the way you mean it

Q—Well, I mean how much does it cost the person that is going to get it that comes to your hospital or that you use it on? A—Well, it is not given to an individual separately, but it is always in combination kits, never given separately by itself

Q—If they get it, the patient, it costs them a hundred dollars doesn't it? A—That would depend altogether some patients pay us a hundred dollars, but they get different kinds of medicine when they are paying that, and they may get the prescription 1020

Q—I am talking about 1020 A—Yes sir

Q—The 1020 prescription A—There isn't anybody that comes and pays us a hundred dollars and gets 1020

Q—Six tubes of 1020, don't you sometimes sell that for a hundred dollars? A—No sir, that wasn't the way it was handled, we used to treat the infected prostates whenever a man came here to the hospital

Q—I am just asking you now about selling it, and how much did you get for prescription 1020?

Mr. Morris Jr.—Counsel interrupts the witness, he asks him a question and then he interrupts the witness before he has time to complete the answer, if your honor please

THE COURT—Let him answer the question. However I will admonish the witness to listen carefully and answer the question, and do not answer something else—and you will both save time

Q—Did you ever get any money when you gave a patient 1020, Doctor? A—Most assuredly

Q—You did? A—Yes sir

Q—How much did you get? A—Well, I can't answer you that question

Q—Now, what is in this 1020? A—1020 is a number that goes on different ampules that I have in my hospital and the ampules are numbered 1020 and those ampules always contain a certain amount of hydrochloric acid one in a thousand, and the twenties indicate 20 cc of liquid in the ampule, and the hydrochloric acid strength of the ampules is one in a thousand, and that is the reason for the 1020 being on that ampule, some ampules 1020 contain nothing but methylene blue water and hydrochloric acid and other ampules contain hydrochloric acid and coloring matter and some of the iodides, and sometimes a small amount of mercury

Q—You mean that this 1020 has different things in it sometimes? A—Yes, sir there are varied forms, the idea of the 1020 is to signify a definite thing

Q—I thought 1020 would be the same thing, but I am so ignorant of such a matter. One 1020 will have one thing and another 1020 will have another thing, is that it, Doctor? A—Yes, sir, and it is identified by the different colors, and there is 1020 blue and 1020 red and 1020 pink and things like that

Q—What do you put in 1020 blue? A—1020 blue is a solution of one in a thousand hydrochloric acid methylene blue and water

Q—How much does that material cost you wholesale? A—Oh, those ampules in large quantities five thousand or ten thousand at a time, cost less than a quarter apiece. I think about eighteen cents

Q—You mean filled? A—Yes, sir

Q—About eighteen cents apiece? A—I think so, that is if you buy them in large quantities that is true

Q—Are those ampules that have the 1020 on them are they blue (showing witness instrument)? A—I don't know whether it was blue or what it was, I would have to see the color before I could tell you

Q—Those were your ampules? A—I don't know whether they were or not

Q—Look at them there A—I am looking at them. I don't know whether they are my ampules or not

Q—Those labels are yours? A—I don't know, I have no way of identifying them the way they are there

Q—You can't tell whether they are yours or not, is that what you mean? A—No, sir

Q—Where did you have those labels printed? A—The labels that go on the ampules—we have the ampules manufactured in the laboratory at New York, and the manufacturing chemists label them in the laboratory

Q—Is there anything different in the labels that you see on there and used to be on your 1020 ampules? A—You know, it has been so long since I looked at one of those labels I don't know

Q—This hasn't got a cork in it but it comes up here with glass and is twisted around and is air tight A—Yes, sir, and if you want to get it out you have to break the top

Q—You have to break the top? A—Yes sir

Q—Now, what do you do with the 1020 blue when you give it to a patient? And how does he take it inside of the body how do you get it into his body? A—It is given into a vein

Q—You inject it into a vein? A—Yes sir

Q—You don't inject it into a muscle? A—No sir

Q—After you inject it into the vein what effect does it have on the patient? A—It increases the number of white blood cells

Q—Now, is this 1020 blue that you speak of, is that isotonic? A—I don't know whether it is or not

Q—Do you know what isotonic means? A—It escapes my mind for a moment, I don't grasp the meaning of it

Q—You don't know what isotonic means? A—It escapes me for the moment

Q—Do you know what hypertonic means? A—I can't frame a definition in my mind, no

Q—Would you read this please (handing the witness instrument), this is a piece that appeared in the Bureau of Investigation pamphlet of the American Medical Association a laboratory report, and see if that is a correct analysis of your 1020? A—Well I don't see anything in here saving anything about the presence of hydrochloric acid

Q—Well, you can turn it over there, it turns over, I believe. Yes, sir, there it is (indicating) A—My solution contains methylene blue and hydrochloric acid, and I don't see that this says anything about the hydrochloric acid being in there

Q—All right now, you heard Dr. Peterson yesterday describe in detail the way you performed the operation at the present time—it is Dr. Petermeyer, I beg your pardon A—Yes sir

Q—You listened to that description? A—Yes, sir

Q—Was it correct, his description of the operation correct? A—In a general way, yes, sir

Q—How would you add to it or how do you want to change it? A—I would let it stand as it is. If I was describing the operation, why, naturally, my description would be a little different

Q—I don't want to take the time— A—I will accept his explanation as satisfactory in order to stay out of all of that rehashing

Q—Now, tell us, please does a little goat gland have little nerves there when you take a little testicle out of a young goat, does it have nerves before it is taken out? A—Naturally, any living organism in an animal body has nerves and blood vessels

Q—Now explain to us, please, how you could make that little testicle of a little—how old were the goats ordinarily? A—About three weeks

Q—That little testicle of a young goat, you claim that that lived and grew after you implanted it in a human testicle? A—Some of them seemed to grow and enlarge and others, the majority of them, went through a process of absorption

Q—Absorption? A—Yes, sir, they were gradually absorbed

Q—How long did it take to absorb? A—I examined patients following the transplantation of them and some of them are gone in three months and some in six months, and I have seen evidence of remnants of them after even one and two years

Q—You mean to say that little thing lived and was just like a part of the human testicle and it was living in there after you put it in there? A—No, sir, I don't conceive of it that way, I don't conceive of it as being a part of the human testicle

Q—Why wouldn't it just get rotten in there? A—If it became infected it would, it would spoil

Q—Well, if you put that little piece of meat in there and it is not getting any blood or anything just laying in there— A—You see, the patient's blood naturally bleeds into the little pocket where the gland is placed

Q—Where is it coming from if there isn't a hole in the blood vessel of the human for it to get out? A—The gland itself is a sponge-like tissue, just like a piece of sponge, and whenever you drop it in a patient where there is an open wound it immediately becomes filled with the blood from the patient, just like a sponge becomes filled with water from a drop of water

Q—You don't claim you connected up the nerves or any blood vessels? A—Oh, Lord, no

Q—You just took this little thing separate and put it in that slit in the testicle and sewed it up? A—Yes, sir

Q—And the blood in the body of that testicle would squeeze in there to keep that thing alive so it wouldn't rot in there, is that the idea—I may express it very crudely A—Naturally when that foreign matter was placed inside the patient's body it was surrounded by the patient's blood vessels, and that would be the first thing that would happen and the blood vessel—I mean the patient's white corpuscles would naturally rush in and in the process of inflammation that would be set up in there in some of these patients there would be a substance like a sac that would really form around this gland, I have opened them up later and seen them where it looked like nature herself had tried to put a capsule around this gland

Q—Now, Doctor, just a question aside here. Now, up there in your country hospital, up there in Arkansas, the one out in the country, who now receives the patients there at the hospital, the doctor that admits them into the hospital? A—Dr. Purcell

Q—How do you spell that? A—Purcell

Q—Now, in your advertisements or talks do you tell the patients or the public that you treat prostate glands without surgery? A—No, sir

Q—You tell them you treat it without removing the prostate? A—Yes, sir, that is it, yes, sir

Q—This part of your operation is that you take a tube and an electric needle and put it up there, and that is the surgery that cuts a part of the prostate off, isn't it? A—Yes, sir, trims off part of the prostate

Q—Just briefly, without describing the operation, what do you claim is the effect—like a man that is suffering with prostate trouble and you operate on him with the usual and normal operation, what do you claim is the effect of that operation? A—The prostate gland is reduced in size

Q—What is the effect that it has on the man? A—The man feels better and he becomes more energetic and he gains weight and his appetite becomes better and his outlook on life is better

Q—Does it have any effect on his sexual powers? A—Many of the patients say it has a good effect and the sexual powers are increased, yes sir

Q—Sometimes does the patient, after he leaves you, for a post operative treatment and he goes home, does he take along with him some of the tubes of 1020? A—No sir, we don't permit that, and we haven't in several years

Q—You used to do that? A—Several years ago we did but we do not do that any more

Q—Well now, when the patient took this 1020, when you used to let him take it home and let his own doctor treat him with it these six tubes how much did you charge him for it? A—We wouldn't charge him anything for that, sometimes the man had to go home before he could complete the amount that we wanted to give him, so we would send the supply home with him so his physician could complete the treatment

Q—Didn't Dr. Petermeyer state that yesterday? A—Dr. Petermeyer was confused there, we don't charge any patients a hundred dollars and we don't send any medicine to be given hypodermically or intravenously to any patient

Q—I notice on one piece of literature it says "J. R. Brinkley, M.D.," and what is that M.D.? A—Doctor of Medicine

Q—It says C.M., and what is that? A—Master of Surgery

Q—Then it says Dr. P.H. A—That is Doctor of Public Health

Q—Sc.D. A—Doctor of Science

Q—And then "Chief Surgeon" Now, where did you get all of those degrees from? A—Well, on this diploma I have, it says "Doctor of Medicine and Master of Surgery," and that entitles you to say M.D. and C.M. if you care to, the Doctor of Science degree was conferred on me by the Chicago Law School, an honorary degree and the Doctor of Public Health was conferred on me by the Eclectic Medical University of Kansas City, Missouri where I received my M.D. degree

Q.—Who was that that conferred the Doctor of Science? A.—The Chicago Law School, Chicago School of Law.

Q.—So, it was the Chicago Law School? A.—Yes, sir.

Q.—Do you also put on your names sometimes LL.D.? A.—I will declare, I don't know.

Q.—Do you ever claim you have had a degree of LL.D.? A.—I don't remember.

Mr. Brown:—That is all the questions we care to ask.

Mr. Morris Sr.:—We expect to put him on later, but we will not ask any questions now, Your Honor.

THE COURT:—All right.

Witness excused.

Mr. Reynolds:—Your Honor, at this time we would like to introduce a few exhibits, marked Exhibits 39, 40, 41 and 42, inclusive. (Handing instruments to counsel for plaintiff.) While those exhibits are being inspected, we are going to offer these in evidence, it being the marriage license of John R. Brinkley—well, if you wish to inspect those first, (handing instruments to counsel for plaintiff).

Mr. Brown:—Excuse me, Your Honor, but there was a matter that I overlooked to ask Dr. Brinkley.

THE COURT:—Do you want him to resume the stand?

Mr. Brown:—Yes, sir.

THE COURT:—All right.

Dr. John R. Brinkley, recalled as a witness for further cross examination, having been previously duly sworn, testified as follows, to wit:

FURTHER CROSS EXAMINATION

Questions by Mr. Brown:

Q.—Doctor, did you write these letters? (Handing witness instruments.) A.—Yes, sir, those letters were written by me.

Mr. Brown:—I offer the letters in evidence (Exhibits 43, 44 and 45).

THE COURT:—What is your objection to this, Counsel?

Mr. Morris Sr.:—To these and the others, Your Honor, there are quite a number of different documents and there are various different objections to them, and we don't want to encroach upon the rule of discussion of the matter in the presence of the jury, and it brings up the question of some matters about which it will be necessary to put on some evidence.

THE COURT:—Particularly, what are the grounds, without the argument? There is a difference between making the argument and just giving the technical objection.

Mr. Morris Sr.:—I shall show that the letter of February 8, 1935, is a privileged communication, and that, among others, is the objection. Then, as to all of them that they are immaterial and irrelevant to any issue, and they relate to a wholly different collateral matter not involved in any way in this proceeding, and they are incompetent to establish any issue or any defense in this case.

THE COURT:—All right, I will hear from the other side. I will ask Counsel, without testifying in any way or without attempting to state the contents of these things, to tell me why you think they are admissible.

Mr. Brown:—Your Honor, there is one part that is alleged on here by the plaintiff as to the effect that the doctor continues to make money, notwithstanding the efforts of the various governmental departments and agencies, and there is another portion of the article declared on which says he is still on the air in spite of many efforts to remove him from the air, and these letters are written by Dr. Brinkley to the radio station.

Q.—Dr. Brinkley, was Mr. Burke your attorney? A.—Yes, sir.

Q.—And did you have a contract and have some business with Radio Station KFGE in St. Joseph, Missouri? A.—Yes, sir, I was broadcasting over it by remote control.

At this point there was considerable discussion over the introduction of pamphlets, documents and evidence relative to various incidents which were associated with the career of Dr. Brinkley and as to the possibility of the introduction of such materials.

EVIDENCE OF JACK K. TINGLE

Jack K. Tingle, official court reporter from Dallas, Texas, introduced in evidence copies of broadcasts made by Dr. Brinkley from his station in Mexico in 1931.

TESTIMONY OF DR. EUGENE W. SCHOEFFEL

Dr. Eugene W. Schoeffel, chemist employed by the American Medical Association, testified as to his examination of the contents of ampules sent to the American Medical Association by physicians who had obtained them from patients of John R. Brinkley.

The evidence proceeded:

Q.—Now, Doctor, will you tell us what you determined from your analysis to be the contents of these ampules.

Mr. Morris Jr.:—The Court notes that our objection goes to all of this.

THE COURT:—All right.

A.—First the material was measured out.

Q.—Just a minute, Doctor, don't tell me how it was all done, but tell the jury what your conclusions were, what your findings were after all of these tests were made, the stuff that was in it, that is what we want to know.

A.—You want to have the conclusion of the tests? Q.—That is right. A.—The conclusion was placed down that this ampule contained approximately 20 cc. of a bluish-sapphire-like liquid, which had a density—I will have to quote,—

THE COURT:—You may refresh your memory, and I told you that, but you must not read it to the jury, but you can refresh your memory and then testify.

A.—Which had a specific gravity of 0.9985 in respect to water, and at 25 degree solution, 0.9971.

Q.—What do you mean by that last statement, just in ordinary language so everybody can understand it. A.—By specific gravity is meant the weight of a measured solution at a certain temperature.

Q.—And does your statement mean that it is about the same as water as to what you found as regards this specific gravity? A.—Something like it, very close to distilled water.

Q.—What else was found? A.—It was also found that the color of the solution is of the indigo type.

Q.—Will you explain just briefly why you use that term "indigo type"? A.—The color chemist knows approximately over 2,000 different blue colors.

Q.—And the indigo type? A.—The indigo type is a certain chemical formula by which various shades and hues of blue color can be made.

Q.—Is that the same coloring substance as one gets from methylene blue? A.—No, sir, it wouldn't be methylene blue, this is a different color type.

Q.—All right, now, what else was found? A.—Besides that, the spectroscopic analysis indicated the presence of several metal elements; however, these elements were found in traces only.

Q.—What do you mean by saying they were found in traces only? A.—From one of the tests we found that the solution contained approximately 0.004 of a per cent of dry material.

Q.—0.004? A.—0.004.

Q.—Is that in connection with these 20 cc. of material you say were in here after you had obtained that dry material in whatever process you used—could you see it with your own eyes? A.—It is an exceedingly small amount.

Q.—And what else was found? A.—Besides which we made tests for halogen, and that is the term for chlorine, iodine, fluorine and bromine.

Q.—What did you find? A.—0.2 cc. of the solution was tested with 1 cc. of diluted nitric acid and 1 cc. of silver nitrate test solution, and no detectable traces of chlorine could be found.

Q.—With that finding is it possible there was any hydrochloric acid in this solution, or not? A.—There is a remote possibility that chlorine could have been present if the entire 20 cc. would have been used.

Q.—And if chlorine were present that would mean hydrochloric acid, would it? A.—Not directly.

Q.—It might mean that? A.—It might mean.

Q.—From the sum of all of your tests were you able to determine whether or not, and have you a finding as to whether or not there was any hydrochloric acid in this solution? A.—I only can say that the tests produced on 0.2 cc. didn't give us a detectable trace of chlorine; however, it is known that a specialty ampule glass under certain conditions gives off traces of chlorine.

Q.—All right, now, Doctor, in making your analysis you spoke about finding dry substances, dry matters, dry materials, and how did you get that from this as it originally appeared? A.—The material was dried down in a platinum dish over a waterbath.

Q.—That is the same as boiling? A.—Boiling down.

Q.—And how large a speck did you find of dry material, the size of the head of a pin or the size of a pin point, or what—something we can understand. A.—Say, the point of a pin.

Q.—And it was from that dry material that all of your subsequent analysis was made. Is that right? A.—Yes, sir, after the acidity of the solution was stated.

Q.—What else did you find in the dry materials, if anything? A.—I have to refer back (looking at paper); the amount of hydrogen concentration we found to be of a very weak solution, and this led us to believe—

Mr. Morris Sr.:—We object to what they would believe, Your Honor.

Mr. Reynolds:—I think he is going to—

THE COURT:—He can say what he believed himself, but he couldn't speak for anybody else. He used the term "us," and I don't know what he is talking about.

Q.—You made this analysis yourself, and that is what you are talking about? A.—Yes, sir, I do.

Q.—Well, what was it that you actually found, now, without regard to what you believed, at the time when you completed another test, just say what was it you found—I want to know what was in that pinpoint of matter.

THE COURT:—It seems to me the way you develop this is highly technical.

Mr. Reynolds:—It is very difficult.

THE COURT:—I don't know whether it is or not. State the technical proposition in order to get it into the record and then ask in terms of a, b and c what he is talking about. You asked Dr. Brinkley, or co-counsel did, and he said he had methylene blue and a little hydrochloric acid in it and outside of that it was water; now, you can take one of these chemists, one of these ten chemists, and he could probably talk to you about that for a week, take a little pinpoint of solid matter and break it down and talk about it a long time and nobody would understand it, and you are not getting anywhere.

Q.—The last question is to tell us, just enumerate the substances you found in that little point of a pin of matter, if you haven't named them all. A.—Traces of metallic elements, approximately 0.003 of a per cent of indigo type dye, and most of the indigo type dyes contain a small, practically immeasurable amount of sodium chloride, and the ampules also give off sodium chloride.

Q.—Did you find this substance to be an isotonic substance? A.—No, sir, the substance wasn't isotonic.

Q.—Will you explain to the jury, so that we can understand it, what we mean by isotonic? A.—Isotonic is understood to be a solution which is comparable with a 0.9 per cent sodium chloride solution, and it is generally called a physiological salt solution, and if the solution is below the content of 0.9 per cent sodium chloride, the solution is called hypotonic, and if it is above 0.9 per cent sodium chloride it is called hypertonic.

THE COURT:—Now, wait a minute. The province of the Court in presiding over the trial is to proceed in order to get something out of it, and you asked him to explain that so we could understand it, and after all, I suppose the purpose of putting the witness on was to find what he found in the ampules and say it so somebody besides a chemist can understand it, and if the ampule had medicine or chemical properties that had some significance, let him say so, and if it was nothing but colored water, let him say so, but a man can talk about H₂O and he may know what it is, but the general public wouldn't know it is water; so, let's talk in the terms of the Court and the Jury.

Mr. Reynolds:—He can't go into the therapeutic effects because it takes a doctor to do that, and we will tie that up later.

The cross examination brought out the fact that the ampules had been handed to the witness by Dr. P. N. Leech, director of the laboratory of the American Medical Association.

(To be continued)

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SATURDAY, MAY 13, 1939

THE WAGNER NATIONAL HEALTH BILL

In the Organization Section of this issue of THE JOURNAL appear statements of hearings held before the Senate Committee on Education and Labor last week, before which appeared Senator Wagner himself, Miss Josephine Roche and later Dr. Arthur W. Booth, representing the Board of Trustees of the American Medical Association. Previously representatives of many farm agencies had appeared before the Senate committee urging legislation to increase federal expenditure for health. At a subsequent date representatives of some of the various state medical societies will appear before the Senate committee, as will also a group of representatives of the American Medical Association.

Easily apparent thus far is the failure of the Interdepartmental Committee to Coordinate Health and Welfare Activities to be influenced to any considerable extent by the various agencies which appointed committees to consult with the committee. When the President of the United States sent the National Health Program to the Congress in January, recommending careful study rather than enactment, it was apparent that the National Health Program had not been modified in any appreciable manner as a result of such hearings. Moreover, in her statement before the Senate committee last week Miss Roche again emphasized the assertion that the statistics in the National Health Survey had not been challenged, notwithstanding the fact that in THE JOURNAL, as well as in many other publications, such challenges have been made. Especially notable, of course, are the considerations of the American Hospital Association and the Catholic Hospital Association, which certainly have challenged some of the statements relative to the needs in the hospital field. Indeed, the most significant challenge yet made appears in the words of Alphonse M. Schwitala, S.J., who says "If all this is social security, if all this is necessary for the preservation of the national health, then justly a philosophy of health care must be restated, and medical practice and hospital practice as today understood must be razed to give way

to overpowering structures of huge bureaus, national councils and state organizations founded not upon Christian inspiration but upon legal enactment." If any further challenge is needed, readers of THE JOURNAL are referred especially to the general statement presented by Dr. Arthur W. Booth, Chairman of the Board of Trustees, which appears on page 1972 of this issue.

The representatives of the American Medical Association who will appear before the Senate committee at a later date will present facts and documents which controvert absolutely some of the statistics and data on which many of the recommendations in the Wagner National Health Bill are based. The medical profession will do well to bear in mind that the House of Delegates of the American Medical Association at the session to take place in St. Louis next week no doubt will express clearly the point of view of the American Medical Association in this proposed legislation.

THE CALL FOR THE PHARMACOPEIAL CONVENTION OF 1940

The President of the U. S. Pharmacopeial Convention is authorized to issue a call for the decennial meeting on May 1 of the year preceding the meeting. By this time various medical societies and medical colleges, as well as various pharmaceutical groups, should have received the call and the request to send delegates. Before the Pharmacopeial Convention of 1930 the Council on Pharmacy and Chemistry¹ urged all organizations, medical, pharmaceutical, chemical and others, carefully to select delegates noted for high ideals, for breadth of vision and for sound judgment as well as for technical knowledge. The aims and purposes of the Pharmacopeia were admirably expressed by its principal founder, Lyman Spaulding, M.D., in the preface to the first edition.

In its editorial of ten years ago THE JOURNAL stated:

Although federal laws concerned with the control of the purity of drugs provide for the enforcement of drug standards set forth by the Pharmacopeia, the book is not published by or under the control of the federal government. It is published by authority of the United States Pharmacopeial Convention. This body is composed of members who are sent as delegates by national or state associations of physicians, pharmacists and other groups concerned with medicine and drugs, by schools of medicine and of pharmacy, and by certain government services. The convention meets once every ten years, and its chief function is the selection of the Committee of Revision of the United States Pharmacopeia. To this committee is assigned the task of making any desired changes in the Pharmacopeia then in force and of issuing a revised edition of the book. The next Pharmacopeial Convention has been called for May 13, 1930, at which time the delegates appointed by the constituent bodies will meet in Washington, D. C., and inaugurate the preparation of the next, the eleventh, revision of the United States Pharmacopeia.

The convention of 1930 was in many respects unsatisfactory because its conduct was undemocratic and

1. The Call for the Appointment of Delegates to the United States Pharmacopeial Convention, J. A. M. A. 93: 989 (Sept. 28) 1929.

unscientific. Astute and industrious interests overwhelmed the convention with their representatives. Fortunately, the Board of Trustees of the U. S. Pharmacopeia, the chairman and his helpers on the Revision Committee were able to carry out their work efficiently. As a result, the Pharmacopeia of 1930, which became official in 1936, was much better than might have been anticipated but it was produced without some assistance which might otherwise have been secured.

The entire method of developing the Pharmacopeial Convention requires radical revision. At present any organization entitled to representation may send three delegates. Medical organizations, unfortunately, do not feel in a position to pay the expenses of three delegates. Some schools of pharmacy and pharmaceutical organizations have full representation because commercial interests are willing to see that delegates participate in the convention. Thus in 1930 medical delegates were outvoted by this arrangement.

When the Pharmacopeia was first devised, distances were great and communications were difficult. It was therefore provided that no one could be a member of the Revision Committee unless he attended the Pharmacopeial Convention. The Revision Committee of 1930 was deprived of the services of many good men, had they been willing to serve, on no other ground than that they had not attended this haphazard, ill conducted convention. Medicine has asked either that it be given equal representation on the Revision Committee or that, as it requested in 1930, it be given one third representation, with the understanding that therapeutic scope shall be controlled entirely by the medical group and that questions of pharmaceutical necessity be decided by the pharmaceutical group. This was denied. If the cooperation of the medical profession is to continue, some effort must be made to meet the reasonable demands set forth in 1930.

In various meetings of the Council on Pharmacy and Chemistry, the Board of Trustees, and other bodies of physicians, the following principles have been formulated: To correct the evils of one-sided representation it would seem that only one vote should be accorded an organization. This would preclude the practice by some pharmaceutical interests of securing credentials from various organizations or schools and selecting delegates who will vote as they request in the convention. The rules should be corrected so that the most capable men in the country may serve on the Revision Committee, and the prerequisite that a man must attend the convention to serve on the committee should be removed. Until these amendments are made there should be restored the agreement of the 1920 Pharmacopeial Convention that medical men shall control therapeutic scope and pharmaceutical men shall control pharmaceutical scope.

During the past five years progressive leaders in the pharmaceutical field have shown commendable effort in

trying to work out some method whereby a reasonable scheme of cooperation with physicians may be established. The Board of Trustees of the U. S. Pharmacopeia met recently with the Board of Trustees of the American Medical Association to discuss means of cooperation. Many physicians believe that the time has come when the Pharmacopeial Convention must decide on the general principles that have been mentioned before they will commit themselves to full participation on the various committees of revision. The medical profession has shown its desire to be cooperative. The JOURNAL has published during the last year a series of articles on "The Pharmacopeia and the Physician." These articles were published at the request of the Pharmacopeia authorities and they have been received with much favor by both the medical and pharmaceutical professions. To the Pharmacopeial Convention of 1940 only those delegates, medical or pharmaceutical, should be sent who will come with broad-minded attitudes and with the serious wish to work harmoniously toward constructive policies.

Current Comment

SEX HORMONES HOLD THE STAGE

Today the desks of physicians are being flooded again with fantastic advertising claims for sex hormones. New heights have been reached with the publication of two pamphlets, "Perandren" (Ciba) and "Roche Review" (Roche-Organon). The recommendations reveal a policy with little regard for scientific evidence. The name of one of the Roche-Organon preparations, Neo-Hombreol (presumably new manhood oil), is significantly reminiscent of "Lost Manhood" exploitation. And most of the claims are apparently based on one or two experiences in which the reporter has neglected to discount for the power of suggestion. Ciba naively advises testosterone propionate for therapy on the basis of admitted "bits of evidence, published and unpublished." "Atonicity" and "mammary gland pathologies" are among the firm's recommended indications for androgenic therapy. But this is conservatism itself when compared to the opus of the "scientific staff" of Roche-Organon, who have prepared a chart and "dosage schedule" for sex hormones. Here are indications, dosage and everything except references to scientific literature urging androgenic therapy for many conditions, including epispadias, hypospadias (conditions which always have required and always will require surgery) and Graves' disease in women. Estrogenic therapy is prescribed for acne, alopecia, impetigo, Buerger's disease, iridocyclitis, polyarthritis and many another condition. And in the following effusion Mr. Elmer Bobst really "goes to town."

Dear Doctor:

No DOUBT young Juan was greatly admired by all the young ladies of Servas as he matured, for he was a fine looking lad, with a splendid physique and possessed a daring personality. His adventuresome spirit forced him at a very early age to

take a hand in the Moorish Wars, and he was only 33 years old when it led him again to persuade Columbus to let him go along on his second trip to the new world. But by the time the estimable Juan had conquered the Island of Porto Rico and had settled down to the rather soft and engaging life of its Governor, the first shadow of old age started to fall across his pathway. As his vigor began to wane, the Indian legends about the Land of Bimini and its wonderful spring of waters with their marvelous curative powers intrigued him more and more. And soon thereafter Juan Ponce de Leon—for it was none other than the famous Ponce de Leon—set forth on his memorable search for the so-called Fountain of Youth. When Ponce de Leon began his quest of the youth-restoring waters, he was just about fifty years of age. Yes, just about the period of man's life when the downhill journey becomes significant. Is it due to the rapid decrease of the male sex hormone secretion at middle life? More and more physiologists and endocrinologists are coming to that conclusion. A study of the clinical characteristics of the male climacteric, embracing physical, psychological, and functional changes, leads rather definitely to the conclusion that proper administration of testosterone propionate can play the same replacement role in man as does estrogen therapy in the menopause, or female climacteric. Testosterone propionate, which we are making available under the name of Neo-Hombreol, is the active, chemically pure, crystalline propionate salt of the male sex hormone, identical in every respect with the same substance derived from natural sources and with the added advantage of synthetic production. We suggest the experimental use of Neo-Hombreol for combating the annoying symptoms of the male climacteric. Treatment should be started with injections of Neo-Hombreol. For maintenance purpose we then suggest the use of Neo-Hombreol Ointment which is now available in a most accurate dosage form called the Dosule. We will gladly send you a 3-day supply of Neo-Hombreol Dosules if you will make use of the enclosed card.

Sincerely yours,

Elmer H. Bobst,
President.

This flamboyant exploitation obviously presupposes an extraordinary degree of ignorance on the part of the physician. It can do little more than delay the scientific use of these compounds, meanwhile classifying the concerns responsible with others who sponsor reckless claims. The report of the Council on Pharmacy and Chemistry on the Present Status of Testosterone Propionate and on rejection of Perandren, Oreton and Neo-Hombreol appears in this issue of *THE JOURNAL*, page 1949.

SULFANILAMIDE AND SMALLPOX

Elsewhere in this issue (page 1936) is a report of the treatment of four cases of smallpox with sulfanilamide. In three there was only an evanescent macular eruption which rapidly disappeared, and in the remaining case there were only three pustules. Three additional patients observed about the same time were treated only symptomatically and in all three the typical eruption of smallpox developed. All treated and untreated patients recovered. This interesting observation seems to indicate that sulfanilamide, when given early in the disease, has a beneficial effect on the cutaneous lesions and possibly on the disease itself. Although smallpox is increasing (there were 14,355 cases reported for the year 1938) the disease is now mild, as evidenced by only thirty-five deaths in 1936 out of 7,459 cases in that year. In the presence of such a low case fatality rate, conclusions as to the

value of sulfanilamide in preventing mortality from smallpox cannot be drawn from the four cases thus treated.

ABSORBABILITY OF CATGUT

Two recent studies on the absorption of catgut are of much practical importance to surgery. Bates¹ made experiments on adult dogs, using various sizes and types of catgut. After varying intervals it was found that plain catgut excites a prompt and violent exudative foreign body reaction which delays the appearance of fibroblasts and therefore delays wound healing. Large, plain catgut however was absorbed about as fast as the smaller sizes, but no size held throughout the time during which wound support is needed. Chromic catgut was associated with a retarded and lessened exudative foreign body reaction and with the early appearance of fibroblasts and early healing. Further, Bates found that small chromic catgut functions longer than large chromic catgut and that wound support and healing were most satisfactory when the smallest chromic suture was employed. In experiments on human beings, Wolff and Priestley² reported tests of the rate of absorption of various types of catgut. On closure of the incision in an unselected series of abdominal operations an interrupted suture of the catgut to be tested was placed through the anterior fascia of the rectus muscle and tied round a loop of nonabsorbable suture material which was permitted to project from the skin. Gentle traction was made on the projecting suture material every day or two after operation until it came out, thus indicating that the catgut was absorbed. In many cases three and four of these test sutures were used simultaneously. Three hundred and fifty-eight strands of catgut were tested on 164 patients. It was found that small sizes of catgut remained unabsorbed as long as or longer than larger sizes. The average absorption time of 000 chromic catgut in one series of patients was fifteen days. In contrast, strands of chromic catgut 1 and 2 of the same brand were absorbed in the average time of 10.6 days. Single strands of catgut lasted as long as double strands. It might be concluded, therefore, that the only advantage in the use of double strands is to secure greater initial tensile strength. In certain cases chromic catgut was absorbed as fast as or faster than plain catgut, although as a rule the process of chromicizing catgut materially lengthens the time necessary for its absorption. Great individual variations in absorption time were found, the greatest when chromicized catgut was used. These investigators further concluded that labels which indicate the length of time necessary for absorption of catgut are entirely fallacious as far as the human being is concerned, that drainage and suppurating wounds do not cause early absorption of catgut, and that certain brands of catgut consistently last longer than other brands. The practical applications of these newer studies of the absorbability of catgut deserve early confirmation and wide attention.

1. Bates, Robert R.: Studies on the Absorbability of Catgut, *Am. J. Surg.* 43: 702 (March) 1939.

2. Wolff, L. H., and Priestley, J. T.: The Absorption of Catgut in Human Beings, *Proc. Staff Meet., Mayo Clin.* 14: 149 (March 8) 1939.

ORGANIZATION SECTION

HEARINGS ON SENATE BILL 1620, THE SO-CALLED WAGNER NATIONAL HEALTH BILL

On May 4, 1939, Senator Robert F. Wagner appeared before the Senate Committee on Education and Labor to present a statement on the National Health Bill. Briefly, Senator Wagner called attention to previous legislation for health, including the Sheppard-Towner Act, the Social Security Act and the legislation establishing the National Cancer Institute. He pointed out that the President had sent the National Health Program with its considerations to Congress for further study.

Senator Wagner pointed out that the costs of medical care have increased as our resources of medical skill, facilities and personnel have advanced, but that inequalities in the distribution of medical care have been widened. He also said that the National Health Bill was drafted in response to a plea from the people that our government take health from the list of luxuries to be bought only for money and added to the list containing the inalienable rights of every citizen.

Mr. Wagner stated that there is no intention to put the federal government into the business of furnishing medical care and that on all the phases of the bill the initiative will rest with the states. Further, that federal encouragement and cooperation will be effected through the traditional method of grants in aid. He then explained the various phases of the bill. In association with preventive measures is a new program, under title XIII, to enable the states to extend and improve existing provisions for the care of the sick and the treatment of disease. He said: "The Social Security Board, which is charged with the administration of this title, is not authorized to give or withhold grants at pleasure, or to require state plans to develop along any predetermined lines. I have said again and again that nothing in the bill requires the states to establish compulsory health insurance. Within the limits of certain necessary standards, the states are free to provide programs of medical care compatible with the needs and desires of their own people, and made effective through methods of their own choice. The state plan may apply merely to people on relief or extend to others higher in the economic scale. It may be financed by general taxation, by the contributions of the beneficiaries of the medical services, or by combinations of these methods. The scope of medical services and the manner of their provision will be for the individual state to decide, so long as the program is statewide or becomes such within five years, involves financial participation by the state, and complies with other standards prescribed by the bill."

Senator Wagner said that the bill does not propose to flood the country with hospitals and health centers, and that no money would be advanced until the submission of a careful state plan. He also defended the reorganization which places the United States Public Health Service under the Social Security administration with the following statement:

"The plan of reorganization recently submitted by the President properly conceives of health protection as an integral part of our efforts toward human security. By placing both the Social Security Board and the Public Health Service in the new Federal Security Agency, the reorganization plan establishes a sound nucleus for the coordination of federal health functions which is so essential to the efficient operation of a national health program."

It was his concept that the exactment of this program would result in the practice of economy, since sickness is responsible for one third of all dependence on public relief or private charity.

"In closing," he said, "I want to pay deserving tribute to the unselfish spirit, enterprise and generosity of the members of the medical profession for the splendid and self-sacrificing labors in alleviating sickness and promoting the people's health. A major purpose of this legislation is to help them to carry more effectively a burden which they have long carried alone. Both in the consideration of the bill and in its administration upon enactment, we bespeak, and we know we will have, the support and cooperation of the members of the noble profession which 'has for its prime object the service it can render to humanity.'"

STATEMENT BY JOSEPHINE ROCHE

Miss Josephine Roche, in her appearance before the Senate Committee on Education and Labor, recapitulated the development of the National Health Program and told the story of the National Health Conference. She emphasized also the deficiency of medical care among the poor and among people with small income, and some of the other statements made in the National Health Survey. In her statement on the National Health Conference she said "At the end of the first day's session, one of the participants asked the question 'Are there any members of this conference who seriously challenge the statements with reference to need which were made this morning?' This question was stated to the conference by the presiding officer. There were no challenges then and there have been none since." Obviously all readers of THE JOURNAL know that the figures of the National Health Survey as to medical care have been repeatedly challenged in many ways by many different agencies.

Miss Roche then proceeded to outline the National Health Program as developed by the Interdepartmental Committee to Coordinate Health and Welfare Activities of the United States government. She then pointed out that her committee did not recommend state medicine or a federally administered system of compulsory health insurance but that it did recommend the assistance of grants in aid. She stated that nineteen groups had met with her committee following the National Health Conference and that these groups were essentially in agreement as to the need for action and, "so far as there were any differences of opinion among some of these groups, they differed only as to how far and how fast such action should proceed." In her conclusion she said:

"May I emphasize that the committee's recommendations are not aimed merely at conditions as they exist today but, in the words of the President of the United States to the National Health Conference, 'we have before us a comprehensive, long-range program, providing for the most efficient cooperation of federal, state and local governments, voluntary agencies, professional groups, mediums of public information and individual citizens.' The committee does not visualize that it is practicable to put into effect immediately the maximum recommendations. It contemplates expansion along well planned lines with a view to achieving operation on a full scale within ten years. However great the difficulties, it must be realized that we shall learn only by doing. The committee therefore feels very strongly that the time has come to make a decision on a national health policy and a beginning on a national health program."

"The bill introduced by Senator Wagner, S. 1620, now under consideration by the Senate Committee on Education and Labor, would translate into reality the recommendations of the Interdepartmental Committee. In view of the importance of the nation's human resources, I trust that this legislation may be given serious and prompt consideration."

STATEMENT OF DR. ARTHUR W. BOOTH, CHAIRMAN OF THE BOARD OF TRUSTEES OF THE AMERICAN MEDICAL ASSOCIATION

On May 5, Dr. Arthur W. Booth, chairman of the Board of the Trustees of the American Medical Association, appeared in behalf of the Association and made the following statements:

I thank the committee for this opportunity to state the position of the American Medical Association with respect to some of the proposals set forth in the pending bill, S. 1620, and for the opportunity to be given later to introduce evidence in support of the Association's position. In order that the committee may better appraise what I say and the evidence to be presented hereafter by the Association, I submit for the record a memorandum showing briefly what the American Medical Association is and what its objectives are. Such information is particularly needed just now because of attacks on the Association, some made in good faith and some made apparently because of selfish interests.

It is sufficient at the present moment to say that the American Medical Association is a federation of state medical asso-

ciations. It is governed by a House of Delegates, made up of 154 delegates elected by the state medical associations of which the American Medical Association is composed; fifteen elected by the several sections into which the Scientific Assembly of the Association is divided, each devoted to a particular branch of medicine, such as surgery, obstetrics and internal medicine; and three appointed, one each by the Surgeon General of the Army, of the Navy and of the Public Health Service from the commissioned medical corps of those services. Of the 173,879 physicians lawfully authorized to practice medicine in the United States, 113,113 were on May 1 of this year members of the Association.

The House of Delegates of the American Medical Association fixes the policies of the organization. The House has not met, however, since the bill now under consideration was introduced. It will assemble on May 15 in St. Louis and will consider the bill, and representatives of the Association will report to your committee as promptly as practicable whatever action the House takes. They will lay before you, too, some of the many data that the Association has assembled during recent years, relative to the economics of medical service from the standpoint of the physician, of the hospital and of the people.

Although the House of Delegates has not had an opportunity to consider the pending bill, it did consider, at a special session in September last, the so-called National Health Program formulated by what is sometimes referred to as "The Technical Committee on Medical Care." This Technical Committee, it should be understood, was created by a committee appointed by the President and known as "The Interdepartmental Committee to Coordinate Health and Welfare Activities." The report of the Interdepartmental Committee to the President, including the report of its Technical Committee, was submitted to the Congress by the President [See H. R. Doc. 120, 76th Congress, 1st session], and S. 1620 proposes to make the recommendations of the Interdepartmental Committee, or some of them, effective. The conclusions of the House of Delegates of the American Medical Association, at its special session in September last, based on the report of the Technical Committee, are therefore relevant to the pending bill and to the deliberations of your committee, so far as the bill is founded on that report.

Judged by the principles laid down in the resolutions of the House of Delegates in September last, S. 1620, as a whole and in many of its details, is unsound, and its enactment would not be in the public interest. Its enactment, it is believed, would prove a costly mistake, jeopardizing the welfare of the people and seriously compromising the future development of the science and art of medicine in the United States. If the federal and state taxes that will have to be imposed to carry this bill into effect must be imposed, then at least a substantial part of the proceeds had better be devoted to providing for the needy adequate food, clothing and shelter. So far as this bill is concerned, hunger, nakedness, cold and storm are to be left to wreak their damage, the bill proposing only to provide medical, hospital and nursing service to cure the damage for a while after it has been done.

If the principles laid down by the House of Delegates are unsound, the Association will welcome enlightenment. Fortunately, the proponents of this legislation have the opportunity of presenting their evidence in support of it before the House of Delegates of the Association meets in St. Louis, May 15-19. That will make it possible for the House to have such evidence before it in the course of its deliberations. If the House that is about to convene finds that modifications of the conclusions of the House that met in September last are called for, it will make such modifications.

Coming now directly to a discussion of the pending bill, I call attention to the fact that it proposes to authorize the imposition on the people of annual federal appropriations of variable amounts, ranging from \$98,250,000 upward to an indefinite skyward limit and to require the states that cooperate with the federal government under the act to impose on their people proportionate state appropriations. It may seem paradoxical to speak of "imposing" appropriations on the people, but since every appropriation has implicit in it the taxes that have been or must be levied to provide the money appropriated, every appropriation that is made is "imposed" on the people just as truly as are the taxes themselves. The fact that an appropriation is primarily for the benefit of one class of the population while the taxes necessary to cover the appropriation fall directly on another class, possibly even on future generations, does not alter the situation.

So far as I am informed, no evidence has ever been offered to show that any of the projects embodied in S. 1620 were

devised by any of the people of the several states or that the enactment of this legislation is being promoted by them. On the contrary, it is understood that every project embodied in this bill was devised by appointive federal, officials and employees, to be handed down to the people on a "take it or leave it" basis. If the bill is enacted, the federal government will levy on the people the taxes necessary to provide for the payment of the cost of all activities authorized under the act and will then say to the people "Unless you come in on this venture, we keep every cent we have taken from you." Propaganda has been and is being organized to advance the plans of the federal proponents of this legislation, but the federal origin and driving force back of all these projects must not be lost sight of. The origin of these projects need not damn them, but it certainly lays on their federal organizers and proponents an even heavier burden of justification than they would have if the projects had originated in the several states. In meeting that burden, inasmuch as the taxes that the bill requires will fall on the people of all the states, its proponents are called on to justify it for each and every state; not for Alabama or Mississippi or Nevada alone but for New York, Pennsylvania, Massachusetts, Illinois and every other state. The prime necessity for such a state by state justification of this bill lies in the fact that, if there are states whose people are destitute and in distress beyond the power of their respective states to aid them, the Congress may appropriate for their relief on such terms as it sees fit, but without using such destitution and suffering in one state as an excuse or justification for imposing tax burdens and federal guidance and control on states whose people are not destitute or suffering and that are able to manage their own affairs.

It has been claimed in support of universality for legislation of this type that the federal taxation and the federal guidance and control that go with it are necessary:

1. To stimulate the states,
2. To equalize the health opportunities in all the states, and
3. To procure uniformity in health activities throughout the United States.

To lay the heavy hand of federal guidance and control on a state may serve quite as well to destroy its initiative as to stimulate it, and to subject every state to federal control and thus to establish uniformity may deprive the federal government of stimuli from the states; and stimuli from the states and a critical attitude on their part are as necessary to federal efficiency as are federal stimuli and criticism needed to insure state efficiency.

The phrase "to equalize the health opportunities in all the states" is a seductive phrase, but what assurance have we that the increase in taxation and the establishment of federal supervision and control to bring health opportunities to a common level, while raising the opportunities in some states, will not degrade the opportunities that exist in others and thus procure equality, certainly, but an equality of doubtful advantage?

To bring about uniformity of health activities among all the states would certainly tend to delay and possibly to diminish and to destroy opportunities in health endeavors for variation and experimentation that is possible under state control alone, which, under our normal constitutional form of government, furnish advantages that are too little appreciated and taken advantage of. The House of Delegates of the American Medical Association, at its special session in September last, emphasized particularly the need for the promotion of local initiative, supported by state aid and guidance if necessary, and by federal aid, guidance and control only when rendered necessary by the destitution or incapacity of the state.

The fact that the authority granted certain federal officers and the money placed at their command, by the Social Security Act, have not already reduced illness and disability to the extent apparently anticipated by some of the proponents of that act seems to have led to the demand in this bill for enlarged authority and more money, as if authority and money were together all sufficient to work miracles in the field of health. If this bill is enacted, in all probability within a year or two we shall have a repetition of our present experience, a demand for more authority and more money, in the vain hope of hastening a millenium in the field of health. But there is no royal road to health, either of the people as a whole or of individuals. Time and effort are required over long periods of years, and, even after such long periods, time and effort will be found to have produced smaller returns in some communities than in others; for conditions over which we have but limited control, such as race, heredity and meteorological conditions, may be the chief determining factors in causing diseases and death.

If the federal government can, in the brief ten years that has elapsed since the Sheppard-Towner Maternity and Infancy

Act was expressly repealed by the Congress, June 30, 1929 [Public No. 566, 69th Congress; 44 Stat. L. p. 1024], go as far as is proposed in this bill in spreading itself over intrastate activities in the field of health and medical service, there would seem to be no limit on its right to expand. A federal subsidy for police service might well give the federal government supervision and control of all police service throughout the country. A federal subsidy for the operation of state systems of assessment and tax collection might be devised to give the federal government supervision over state activities now regarded strictly as state functions. Possibly a line might be drawn against federal encroachment on the legislative activities of a state, but one can readily envisage a federal subsidy for the aid of state legislatures that would lead to the federal direction and control of their functions.

Concerning the action of the House of Delegates of the American Medical Association in special session in September last, there has been some misunderstanding and some misrepresentation. To make clear what the House did, it is necessary to go at some length into its proceedings. In doing so it is necessary to emphasize again the fact that the action of the House of Delegates at that time had reference not to S. 1620 but to the recommendations of the Technical Committee on Medical Care, an agency of the Interdepartmental Committee to Coordinate Health and Welfare Activities created by the President on which that bill seems to rest. It is therefore only as S. 1620 undertakes to translate into organization and action the recommendations of the Technical Committee that the action of the House of Delegates in September 1938 is pertinent.

1. The House of Delegates in September 1938 recommended the establishment of a federal department of health with a secretary at its head, who should be a doctor of medicine and a member of the President's cabinet. S. 1620 provides for no such officer. In fact, it proposes to leave the preventive and curative medical services of the federal government scattered as widely as ever through the federal organization.

2. The House of Delegates proposed that expenditures for the expansion of public health and maternal and child health services should not include the treatment of disease except so far as it could not be successfully accomplished through the private practitioner. The pending legislation purposes to provide for the treatment of disease under various conditions, without in any way safeguarding the existence of the private practitioner.

3. The House of Delegates favored the expansion of general hospital facilities where need exists and emphasized its approval of the recommendation of the Technical Committee stressing the importance of the use of existing hospital facilities. The House of Delegates did not endorse the committee's recommendation for an increase in special hospitals and for what the Technical Committee calls "health and diagnostic centers." S. 1620 includes no provision for the increased use of existing hospital facilities. It does not limit the expansion of general hospital facilities to situations in which need exists. It does

propose an extensive program in the field of special hospitals and health, diagnostic and treatment centers.

4. The House of Delegates advocated recognition of the principle that the complete medical care of the indigent is a responsibility of the community and of the medical and allied professions and that such care should be organized by local units and supported by tax funds. It recognized the necessity for state aid for medical care in poorer communities. It proposed the limitation of federal aid to cases in which the state was unable to provide assistance for local communities. S. 1620 proposes to make federal aid for medical care the rule rather than the exception. Nothing has been found in it to limit to persons in need the medical care provided by federal funds.

5. The House of Delegates urged the importance of well coordinated programs for the improvement of food, housing and other environmental conditions for the prevention of disease and the promotion of health. It urged the establishment of a definite and far reaching public health program for the education and information of all the people, to enable them to take advantage of the medical service now available. For these basic needs for the prevention of disease and the promotion of health, S. 1620 makes no provision.

6. The House of Delegates refused to foster any system of compulsory health insurance. S. 1620 proposes to pave the way for compulsory health insurance by leaving to the Social Security Board the determination of what constitutes "methods of administration" necessary for the efficient operation of state plans for medical service. The provisions of the bill for grants to states for temporary disability compensation squint in the same direction. The House of Delegates approved the provision of compensation for loss of wages during sickness, but S. 1620 proposes to provide not merely for loss of wages but to provide medical services also.

7. The provisions of S. 1620, authorizing the chief of the Children's Bureau and the Surgeon General of the Public Health Service to set up what are termed "demonstrations," the provisions for the training of personnel, the provisions for an indefinite number of ill defined "advisory councils" and the provisions for the promulgation by various agencies, federal and state, of rules and regulations are matters that have never come before the House of Delegates of the American Medical Association. Obviously, they are all of serious import and will require careful consideration.

The House of Delegates authorized the appointment of ten physicians, under the chairmanship of Dr. Irvin Abell, President of the American Medical Association, to confer and consult with the proper federal representatives relative to the proposed National Health Program. This committee was not consulted in the framing of the pending bill. Had it been consulted, it is possible that through joint studies and investigations and mutual endeavor a bill would have been produced containing an irreducible minimum of issues between the medical profession of the country on the one hand, so far as it is represented by the American Medical Association, and, on the other hand, the proponents of this legislation, a consummation for which your committee might well most devoutly wish.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—The President on April 25 submitted to Congress Plan No. 1 on government reorganization. He proposed, among other things, to set up a new agency to be known as the Federal Security Agency, in which will be grouped the Social Security Board, the United States Employment Service, the Office of Education, the Public Health Service, the National Youth Administration and the Civilian Conservation Corps. At the head of this new agency is to be appointed an administrator with a salary of \$12,000 a year. Representative Taber of New York introduced a concurrent resolution in the House, H. Con. Res. 19, proposing that the Congress reject the President's plan. This resolution was defeated by the House of Representatives May 3, and the President's Plan will become effective on the expiration of sixty calendar days after the date of its submission. S. 685 has passed the Senate, proposing to establish in the United States Public Health Service a Division of Water Pollution Control. S. 1416 has passed the Senate, proposing to make the provisions of the United States Employees' Compensation Act applicable to civil officers of the United States. S. 1964 has been reported to the Senate, proposing to authorize national banking associations to make

charitable contributions. H. R. 2987 has passed the House, proposing to compensate any employee of the United States government who shall furnish blood for transfusion to a member or former member of the military establishment who is a patient in a government hospital.

Bills Introduced.—H. R. 5763, introduced by Representative Barry, New York, proposes to authorize national banking associations to make charitable contributions. H. R. 6068, introduced by Representative Knutson, Minnesota, proposes that on all ethyl alcohol withdrawn and used for other than beverage purposes the tax shall be \$1.10 per gallon. S. J. Res. 107, introduced by Senator Sheppard, Texas, proposes to authorize the President to award the Congressional Medal of Honor to Dr. Anita Newcomb McGee "in recognition of her splendid service to the United States in organizing a corps of trained nurses for the United States Army during the period of the Spanish-American War and the Philippine Insurrection." S. 2107, introduced by Senator Reynolds, North Carolina, proposes to authorize a pension of \$50 a month to all persons who served seventy days or more in the military or naval service of the United States during the Spanish-American War who have reached the age of 65 years, including any woman who

served honorably as a nurse, chief nurse or superintendent of the Nurse Corps under contract. Contract surgeons of the Spanish-American War may not qualify for this pension if the bill is passed. S. 2134, introduced by Senator Schwellenbach, Washington, and H. R. 5727, introduced by Representative Coffee, Washington, propose to amend the Longshoremen's and Harbor Workers' Compensation Act to extend the benefits of it to boommen and raftmen employed in lumbering operations on navigable waters. S. 2138, introduced by Senator Capper, Kansas, proposes to establish in the United States Department of Agriculture a Division of Cooperatives to conduct research in cooperative problems and furnish advisory service to cooperatives. S. 2284, introduced by Senator Walsh, Massachusetts, proposes to authorize the President to appoint in the Navy 100 acting assistant surgeons for temporary service.

STATE MEDICAL LEGISLATION

California

Bill Introduced.—A. 2809 proposes that "All persons, having the ability to pay therefor, and the individuals authorized by the laws of this state to treat the physical and mental condition from which such persons are suffering, and for which hospital facilities are required, are entitled, without discrimination, to the full accommodations, advantages, facilities, services and privileges of any hospital" in the state.

Bills Amended in the Assembly.—A. 2764 was so amended April 28 as to make it the duty of any physician or other person attending a birth to treat both eyes of the infant within two hours after birth with a prophylactically efficient treatment. A. 2177, to amend the workmen's compensation act, was so amended April 25 as to permit chiropractors and osteopaths to render the "medical treatment" which must be furnished injured workmen.

Florida

Bills Introduced.—H. 392 proposes to repeal the present naturopathic practice act and to enact a new practice act for such practitioners. The bill proposes to define naturopathy as "that system or school of medicine which is taught and practiced in the standard schools and colleges of Naturopathy." Such licentiates apparently will have the right to use x-rays, electro-therapy, anesthesia, antiseptics, germicides, parasiticides, narcotics and antidotes. The bill states that "Physicians of the Naturopathic School of Medicine are to be of equal rank and grade as the physicians of the other schools of medicine designated as allopathic, homeopathic and eclectic, to have all rights, except to practice major surgery and to use materials not taught in the standard colleges or schools of Naturopathy." S. 263 proposes to make it the duty of any person attending a confinement case, within two hours after the birth of the child, to instil in each eye of the child a prophylactic solution prescribed by the State Board of Health for the prevention of ophthalmia neonatorum. S. 306 and H. 352 propose to establish at Avon Park, in Highlands County, a branch of the Florida State Hospital for the care of insane persons. H. 527 proposes, as a condition precedent to the issuance of a license to marry, that each party to the proposed marriage present a certificate from a licensed physician stating that the party has been given such examination, including a standard serologic test, as may be necessary for the discovery of syphilis, made not more than thirty days prior to the application, and that, in the opinion of the physician, the party is either not infected with syphilis or, if so infected, is not in a stage of that disease which is or may become communicable to the marital partner.

Illinois

Bills Introduced.—H. 876 proposes to enact a separate drugless therapy practice act and to establish a board of examiners to examine and license applicants for licenses to practice drugless therapy. The bill proposes to define drugless therapy as "a biological, physiological, chemical and material health science and as such employs physical, laboratory or other methods of diagnosis or analysis and such other procedures necessary to proper diagnosis and treat human ailments, diseases, defects, injuries, functions or dysfunctions, abilities or disabilities of

the human body by or with manipulations or correction of any displaced tissue of any kind or nature and by or with the administration of, employment or performance of, diet, food, biological substances, vitamins, minerals, herbs or other substances normal to or necessary to the functions of the human body and including mechanotherapy, electrotherapy, obstetrics, phytotherapy, irradiation therapy, psychotherapy, hydrotherapy, thermotherapy, physiotherapy, and physical therapy." H. 922, to amend the motor traffic code, proposes that, on the trial of a defendant charged with driving while under the influence of intoxicating liquor, the court may admit evidence as to the amount of alcohol in the defendant's blood at the time of the alleged commission of the offense, as shown by a chemical analysis of his urine, saliva, breath or other body substance. Evidence that there was, at the time of the alleged commission of the offense, 5 hundredths of 1 per cent, or less, by weight of alcohol in the blood is prima facie evidence that the defendant was not under the influence of intoxicating liquor sufficiently to impair appreciably his driving ability. Evidence that there was at that time from 5 hundredths of 1 per cent to 15 hundredths of 1 per cent by weight of alcohol in the blood is to be relevant evidence but is not to be given prima facie effect in indicating that the defendant was under the influence of intoxicating liquor. Evidence that there was at that time 15 hundredths of 1 per cent or more by weight of alcohol in the blood is prima facie evidence that the defendant was under the influence of intoxicating liquor sufficiently to impair appreciably his driving ability. H. 978 proposes to grant to a hospital caring for a person injured through the negligence of another a lien on all rights of action, claims, judgments and compromises accruing to the injured person because of his injuries. The total amount of the hospital's lien, however, is not to exceed one third of the sum paid or due the injured person.

Massachusetts

Bill Introduced.—H. 2206 proposes to create a special committee to investigate the advisability of the commonwealth's furnishing oxygen tents to stated hospitals.

Michigan

Bills Introduced.—S. 419 proposes to enact a new workmen's compensation act and to provide compensation for workmen suffering disability because of injuries or diseases arising out of and in the course of employment. The employer must pay for such medical, surgical or other attendance or treatment, nurse and hospital service, medicine, crutches and apparatus for such period as the nature of injury or the process of recovery may require. An employee is to be permitted to select his own physician from a list compiled by the department of labor on the recommendation of the medical societies of the several counties. A. 785 proposes to enact a law to regulate the manufacture, distribution and advertising of foods, drugs, cosmetics and devices.

Missouri

Bill Introduced.—H. 717 proposes to condition the issuance of a license to marry on the presentation by both parties to the prospective marriage of certificates signed by the parties in the presence of and executed by a licensed physician or by the director of a laboratory approved by the Department of Health that the parties are free from all venereal diseases.

New York

Bill Introduced.—S. 2021 proposes to continue until March 15, 1940, the temporary state commission created by chapter 743, Laws, 1937, to examine, report on and recommend measures to improve facilities for care of hard of hearing and deaf children and children liable to become deaf.

Pennsylvania

Bills Introduced.—S. 545 proposes to prohibit the operation of a private nursing home or a private hospital without a license from the Department of Welfare. The present law requires licensure for private nursing homes or private hospitals operated for profit. H. 688 proposes to require all hospitals receiving appropriations from the commonwealth to pay each intern an annual salary of not less than \$1,000.

H. 1409 proposes a procedure whereby hospitals may be reimbursed by the state for care and treatment rendered indigents injured in motor vehicle accidents. S. 677 proposes to authorize the board of commissioners of any county of the third class to enter into agreements with general hospitals within its boundaries for the care of indigents and part-pay patients afflicted with contagious diseases. S. 732 proposes to require every hospital receiving an appropriation from the state to conclude contracts with all nonprofit hospital service associations authorized to operate within its area. H. 1401 proposes to enact an occupational disease act to provide compensation to workers contracting occupational diseases, as defined in the act, in the course of their employment. The bill proposes to define "occupational disease" to mean only poisoning by arsenic, lead, mercury, manganese, phosphorus, methanol, carbon bisulfide, hydrocarbon distillates or halogenated hydrocarbons, benzol or nitro amido or amino derivatives of benzol; caisson disease; radium poisoning or disability due to radioactive properties of substances or to roentgen ray; poisoning by or ulceration from chromic acid or bichromate of ammonium, potassium or sodium; epitheliomatous cancer or ulceration due to tar, pitch, bitumen, mineral oil or paraffin; infection or inflammation of the skin due to oils, cutting compounds, lubricants, dust, liquids, fumes, gases or vapor; anthrax; silicosis or anthraco-silicosis; and asbestosis.

OFFICIAL NOTES

THE ST. LOUIS SESSION

Special Radio Programs

The following radio programs have been arranged in connection with the annual session of the American Medical Association in St. Louis:

Dr. Irvin Abell, President of the Association, will broadcast over the Blue network of the National Broadcasting Company Monday, May 15, from 4:15 to 4:30 p. m. central standard time. His subject will be "American Medicine Today." Dr. Rock Sleyster, President-Elect, will broadcast over the Columbia Broadcasting System Monday, May 15, from 3:45 to 4 p. m. Dr. Sleyster will be interviewed by Miss Jane Stafford of Science Service.

Dr. W. W. Bauer, Director of the Bureau of Health Education of the American Medical Association, will broadcast over the Blue network of the National Broadcasting Company Friday, May 19, from 4:15 to 4:30. He will present a summary of the scientific and sociological developments at the meeting.

RADIO BROADCASTS

The radio broadcasts by the American Medical Association and the National Broadcasting Company, under the title *Your Health*, continue as previously announced each Wednesday over the Blue network of the National Broadcasting Company at 1 p. m. eastern standard time (12 noon central standard time, 11 o'clock mountain time, 10 a. m. Pacific time).

Starting April 30, daylight saving time took effect in Chicago. The program is therefore being broadcast at the same hour Chicago daylight saving time, which means one hour earlier central standard time, two hours earlier mountain time and three hours earlier Pacific time. In communities where daylight saving time is in effect there is no change in the hour of the broadcast.

Owing to network conflicts the Chicago broadcast does not occur at 1 o'clock Wednesday but there is a rebroadcast from a recording over station WENR at 8 o'clock each Monday evening (8 o'clock Chicago daylight saving time, 7 o'clock central standard time). The program broadcast each Monday is identical with the network program of the preceding Wednesday.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

- May 17. Healthier Babies.
- May 24. No broadcast because of radio conflicts occasioned by visit of British sovereigns to the United States.
- May 31. Checking Up on Health.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Dr. Vinsonhaler Resigns as Dean.—Dr. Frank Vinsonhaler, dean of the University of Arkansas School of Medicine, Little Rock, has announced his resignation, effective July 1. He will become dean emeritus.

Personal.—Dr. Oneal L. Atkinson has been appointed health officer of Hampton. —Dr. Ralph M. Sloan has been elected a director of the Jonesboro Chamber of Commerce. —Dr. Roy J. Turner has been appointed health officer of Fayetteville. —Dr. Albert S. J. Clarke, formerly of Clarendon, has been transferred as health officer in charge of district number 16 at Ozark.

District Meetings.—The Fourth Councilor District Medical Society was addressed in Pine Bluff recently by Drs. William M. Adams and John Cash King, both of Memphis, Tenn., on "Acute Trauma of the Face" and "Cooperation Between the General Practitioner and the Roentgenologist." —At a meeting of the Sixth Councilor District Medical Society in Hope April 6, the speakers included Drs. Thomas E. Strain, Shreveport, La., on "Hypoglycemia in Children"; Joseph E. Knighton Sr., Shreveport, "Chronic Duodenal Pathology"; Sidney J. Wolfermann, Fort Smith, "Socialized Medicine," and Thomas P. Foltz, Fort Smith, "Acute Traumatic Craniocerebral Injuries." —The Third Councilor District Medical Society was addressed at Forrest City April 13 by Drs. John C. Ayres, Memphis, Tenn., on "Anesthesia and Obstetrics"; Rudolph B. McCormick, Memphis, "Infectious Diarrheas in Children"; Sidney J. Wolfermann, "Duodenal Ulcer from the Medical and Surgical Standpoint," and William R. Brooksher, Fort Smith, "Compulsory Sickness Insurance."

CALIFORNIA

School Named in Honor of Dr. Widney.—The Crippled Children's High School, on the grounds of Polytechnic High School, Los Angeles, has been named the "Dr. Joseph Pomeroy Widney High School." The building was completed last year at a cost of \$100,000. The late Dr. Widney was the founder of the old college of medicine of the University of Southern California and once served as dean and later president of the university.

COLORADO

Society News.—Dr. Jesse G. M. Bullowa, New York, discussed pneumonia before the Medical Society of the City and County of Denver April 4. Dr. Rudolf Schindler, Chicago, will discuss gastroscopy before the society June 6 and give a clinical demonstration. —At a meeting of the Northeast Colorado Medical Society in Sterling March 9, Dr. William R. Lipscomb, Denver, discussed "Hypertension and Its Surgical Treatment." —The Pueblo County Medical Society was addressed in Pueblo March 7 by Dr. Theodore E. Wade on "Industrial Minor Injuries." Dr. Guy H. Hopkins addressed the society recently on "Ocular Palsies." At the former meeting Dr. Frederic J. Peirce was elected to honorary membership.

CONNECTICUT

The Harvey Cushing Festschrift.—The March number of the *Acta Chirurgica* is dedicated as a festschrift to Dr. Harvey Cushing, professor of neurology emeritus, Yale School of Medicine, New Haven, and Moseley professor of surgery emeritus, Harvard Medical School, Boston. The issue contains twenty-five papers, all but two of which are in English.

Society News.—A symposium on cancer and its relation to public health was presented before the New Haven County Public Health Association March 2 by Dr. Matthew Griswold, chief of the cancer research division of the state department of health; Miss Elizabeth Fox, director, New Haven Visiting Nurse Association; Dr. Ashley W. Oughterson, director, tumor clinic, New Haven Hospital, and Dr. John Mendillo, director, tumor clinic, Grace Hospital. —Dr. Charles H. Best, Toronto, discussed "Heparin and Thrombosis" before the Yale Medical Society, New Haven, March 8.

State Medical Meeting in New Haven.—The one hundred and forty-seventh annual meeting of the Connecticut State Medical Society will be held at the Hotel Taft, New Haven, May 25-26, under the presidency of Dr. Hugh B. Campbell, Norwich. The speakers will include:

Dr. Roy D. McClure, Detroit, Modern Treatment of Burns—Reduction in Death Rate (movie).
Dr. Addison H. Bissell, Stamford, Treatment of Wounds.
Dr. Edward J. Ottenheimer, Willimantic, Factor of Delay in Recognition of Common Surgical Conditions.
Dr. James Leonard Vickers, Greenwich, Essentials in Fracture Treatment.
Dr. Claude C. Kelly, Hartford, Problem of Cleft Lip and Cleft Palate.
Dr. Chris H. Neuswanger, Waterbury, Urogenital Deformities.
Dr. Arthur S. Griswold, Bridgeport, Congenital Orthopedic Deformities.
Dr. William J. German, New Haven, Management of Congenital Defects of Nervous System.
Dr. Herbert Thomas, New Haven, Essentials of Pelvicmetry (movie).
Dr. Carl H. Wies, New London, Rational Therapy.
Dr. Sidney S. Chipman, Norwalk, Vaccines of Value.
Dr. Berkley M. Parmelee, Bridgeport, X-Ray Fallacies.
Dr. Robert Glen Urquhart, Norwich, The Apical Cavity in Pulmonary Tuberculosis.
Dr. Francis G. Blake, New Haven, Sulfapyridine in the Treatment of Pneumonia.
Dr. James R. Miller, Hartford, Treatment Procedures for Cancer of the Uterus Advised by the Connecticut Tumor Clinics.
Dr. Carl E. Johnson, New Haven, Dysmenorrhea.

Among others who will discuss the papers will be Drs. Arthur W. Allen, Boston; Thomas H. Lanman, Boston; Chester S. Keefer, Boston, and John R. Fraser, Montreal.

DELAWARE

Dr. Morris to Direct Birth Control Federation.—Dr. Woodbridge E. Morris, Dover, director, division of maternal and child health and of the crippled children's division of the state board of health, has resigned to become director of the Birth Control Federation of America, with headquarters in New York. Dr. Morris graduated at Johns Hopkins University School of Medicine, Baltimore, in 1933. The federation was formed by the recent merger between the American Birth Control League and the Birth Control Clinical Research Bureau.

DISTRICT OF COLUMBIA

Cancer Campaign.—A cancer-control program was launched April 1. Speakers for lay audiences were provided by the speaker's bureau of the Medical Society of the District of Columbia. The campaign was to be concluded at the end of the month although the educational program is to be permanent.

Hospital News.—A department of syphilology will be established at Garfield Hospital to provide facilities for diagnosis, clinic treatment and hospitalization. To be known as department L, the new division will be in charge of Dr. William H. Hough, and Dr. Russell J. Fields will be director in charge of clinical work. There will also be a social service worker. Services and drugs will be free to those unable to pay.

Society News.—At a meeting of the Washington Ophthalmological Society March 6 Drs. Walter O. Teichmann and Edgar Leonard Goodman spoke on "Skin Lesions Around the Eye" and "Muscle Tendon Transplantation for Paralysis of External Rectus."—The George Martin Kober Medical Society was addressed recently by Dr. Frank M. Hand on "A General Reference to the Extremities of the Body" and Otto H. Wendt, D.D.S., "Eruption of Three Sets of Superior Central Incisor Teeth: Case Report."—Dr. William F. Rienhoff Jr., Baltimore, discussed "Peptic Ulcer" before a meeting of the naval medical and dental officers March 6.—A panel discussion on "Recent Advances in the Anemias" was presented before the Washington Society of Pathologists May 10; Dr. Elbert DeCoursey was the mediator and Dr. Roger M. Choisser the leader.

GEORGIA

Society News.—The Ware County Medical Society was addressed in Waycross April 5 by Dr. Thomas J. Ferrell, Waycross, on "Ruptured Peptic Ulcer."—At a meeting of the Colquitt County Medical Society in Moultrie March 17 Dr. James A. Redfearn, Albany, spoke on "The Nervous Patient."—A meeting of the Georgia Medical Society in Savannah March 28 was addressed by Dr. Richard F. Slaughter, Augusta, on "Cranial Cerebral Trauma." Dr. Samuel F. Rosen, Savannah, reported a case of Bazin's disease.—At a meeting of the Fulton County Medical Society April 20, among others, Drs. William Howard and Hugh E. Hailey discussed "Pruritus Ani et Vulvae and Its Relation to Other Allergic Conditions." Among others, Dr. John F. Denton, Atlanta, presented a paper before the society April 6 entitled "Radium and X-Ray in the Treatment of Gynecologic Conditions."

IDAHO

Changes in Health Officers.—Dr. George H. Bischoff, health officer of Bannock County, has been appointed director of the maternal and child welfare and crippled children's division of the state department of health. He will be succeeded by Dr. James V. Foley.

Society News.—A recent meeting of the North Idaho Medical Society was addressed in Lewiston by Drs. Jean D. Kind-schi and Robert H. Southcombe, both of Spokane, Wash., on "Syphilis in Pregnancy" and "Newer Treatments in Psychiatry" respectively.—A special meeting of the Pocatello Medical Society was recently addressed by Drs. Cleveland J. White on skin diseases; James K. Stack, injuries of the wrist, and Stanley Gibson, treatment of respiratory diseases in children. The same speakers who are members of the staff of Northwestern University Medical School, Chicago, addressed the South Side Medical Society recently and the Southwestern Idaho District Medical Society.

ILLINOIS

Physician Honored.—Dr. William F. Scott, Maywood, for many years chief of staff of the Oak Park Hospital, was guest of honor at a dinner April 26 given by the Sisters of Misericorde in honor of his many years of service as chief of the staff of the hospital. Members of the staff presented to the hospital an oil portrait of Dr. Scott, which is to be hung in the hospital gallery, and Dr. Scott was presented with a memorial volume containing the signatures of his friends and associates. Dr. Austin A. Hayden, Chicago, was toastmaster.

CHICAGO

Dr. Szent-Gyorgyi Will Speak on Oxidation.—Dr. Albert Szent-Gyorgyi, professor of medical chemistry, Royal Hungarian Franz Josef University, Szeged, Hungary, will lecture in the Palmer House May 26 under the auspices of the Institute of Medicine of Chicago, on "The Mechanism of Biological Oxidation."

The Annual Hedblom Lecture.—Dr. John Alexander, professor of surgery, University of Michigan School of Medicine, Ann Arbor, will deliver the annual Hedblom lecture sponsored by the Phi Beta Pi Fraternity of the University of Illinois College of Medicine May 17. His subject will be "The Management of Bronchiectasis and Abscess of the Lung."

Personal.—Dr. Max Cutler, director of the Chicago Tumor Institute, recently returned from a cruise around South America in which he gave nine addresses before medical associations and universities. The Chicago Tumor Institute has granted one fellowship to each of the South American countries for graduate instruction in the field of cancer. The fellows will be selected by the deans of the medical schools and the ministers of health.

INDIANA

Society News.—Dr. James O. Ritchey discussed "Serum Treatment of Pneumonia" before the Indianapolis Medical Society April 25 and Drs. Kenneth G. Kohlstaedt and Irvine H. Page, "Sulfapyridine Treatment of Pneumonia." Dr. Andrew C. Ivy, Chicago, discussed "Practical Application of the Newer Concepts of the Physiology of the Digestive System" before the society recently. A symposium on gynecologic surgery was presented before the society March 28 by Drs. Carl Habich, Dudley A. Pfaff, John William Hofmann and Ross C. Ottinger.

IOWA

Instructors in First Aid.—Forty-nine persons received first aid proficiency certificates at the graduation exercises of a Red Cross first aid training course recently completed in Fremont County. Twelve physicians of the county medical society, under the direction of the president, Dr. Ralph Lovelady, Sidney, served as instructors for the group of sixty-two adults, who met each week from Oct. 31, 1938, to Feb. 6, 1939. Personal instruction in bandaging and splinting procedures was given and a demonstration of various resuscitation appliances was conducted. In addition, five minute talks on symptoms, home treatment and prevention of some of the communicable diseases were presented.

KENTUCKY

Home of Ephraim McDowell Restored.—The home of Dr. Ephraim McDowell at Danville has been restored as a memorial to him and to his patient, Mrs. Jane Todd Crawford, and will be formally dedicated May 20. The dedicatory address will be delivered by Dr. Irvin Abell, chairman of the memorial

committee, and President, American Medical Association, and Gov. A. B. Chandler will give the speech of acceptance. A dinner will be held in the evening. The restoration work was done by the WPA and the Commonwealth of Kentucky. The home was presented to the state by the Kentucky State Medical Association.

MAINE

Society News.—Dr. Thomas A. Foster, Portland, discussed "Pyuria in Infants and Children" before the Androscoggin County Medical Association, Auburn, March 16.—Dr. Richard H. Overholt, Brookline, discussed "Developments in the Management of Chest Lesions" before the Cumberland County Medical Society April 21 in Portland.—Dr. Samuel A. Levine, Boston, addressed the Kennebec County Medical Association, Gardiner, April 20, on "Auscultation of the Heart."—At a meeting of the Knox County Medical Association in Rockland, April 11, Dr. Siegfried J. Thannhauser, Boston, spoke on vitamin deficiencies.

MASSACHUSETTS

Health Week in Lynn.—A special program sponsored by the Lynn Young Men's Christian Association marked the twelfth annual "Greater Lynn Health Week" March 11-19. "Youth Health" was the theme of this year's observance. Lectures, radio broadcasts and exhibits were features of the program.

Society News.—Dr. Harry Goldblatt, Cleveland, discussed "Experimental Observations on the Pathogenesis and Treatment of Hypertension" before the New England Heart Association April 28.—Among others, Drs. Frank H. Lahey and Everett D. Kiefer, Boston, addressed the New England Roentgen Ray Society April 21 on "Carcinoma of the Thyroid" and "Lesions of the Small Bowel."—The speakers before the New England Pathological Society in Wrentham April 20 included Drs. Clemens E. Benda, Wrentham, on "The Bone Development in Mongoloid Deficiency"; Thomas G. Cogswell, Worcester, "Epidermoid Cysts"; Harry M. Zimmerman, New Haven, Conn., "Nervous System Lesions in Hyperinsulinism," and Milton C. Winternitz, New Haven, on "Arteriosclerosis."

MICHIGAN

The Hickey Lecture.—Dr. Byrl R. Kirklin, Rochester, Minn., delivered the third annual Hickey Memorial Lecture before the Wayne County Medical Society, Detroit, April 3 on "Bleeding Lesions of the Gastro-Intestinal Tract and Their Roentgenologic Diagnosis."

Portrait of Dr. McKean.—An oil painting by Roy Gamble of the late Dr. George E. McKean will, when completed, be placed permanently in the headquarters of the Wayne County Medical Society. It will be unveiled at the annual meeting of the county medical society. Dr. McKean was president of the society 1919-1920 and served on the board of trustees from 1921 to 1933.

Examination of Mexican Beet Field Workers.—A cooperative plan for protecting the health of Michigan communities from contagious diseases among imported Mexican beet field workers was announced March 10 by the state department of health. The four state associations of sugar beet growers have agreed to pay half the expense of health examinations of field workers before they are brought from Texas and to employ no worker who has not passed a physical examination showing that he is free from tuberculosis and syphilis in infectious stages. The state health department will provide the other half of the cost of the examinations with the aid of funds allotted from the U. S. Public Health Service. The examinations will be made in Texas before the workers are hired by the sugar beet growers' associations. About 10,000 Mexican beet field workers are imported into the state during each growing season and diseases found among these laborers in the past have been a danger to the health of several Michigan communities. According to the state department, an outbreak of Shiga dysentery in Shiawassee County last summer was attributed to this source.

MISSISSIPPI

Personal.—The Gulf Coast Medical Society recently gave a dinner in honor of Dr. Daniel J. Williams, Gulfport, who has been health officer of Harrison County for twenty-five years; he is also a past president of the state medical association.—Dr. William W. Reynolds, Meridian, was recently appointed superintendent of the Matty Hersee Hospital, a state-supported institution, succeeding Dr. George Lamar Arrington.

Society News.—The Delta Medical Society was addressed in Greenville April 12 by Drs. Ira B. Bright, Greenwood, on "Electrocardiogram as an Aid to Diagnosing Heart Conditions"; Joseph G. Peeler, Shaw, "Sulfanilamide—Its Use in General Practice"; Onnie P. Myers, Indianola, "The Management of Diabetes in Country Practice"; Earl T. White, Greenville, "Cancer of the Colon"; James R. Jackson, Belzoni, "Allergy," and Orren W. Hyman, Ph.D., Memphis, Tenn., "What the Present Trend Toward Socialized Medicine Is Going to Do to the General Practitioner."

MONTANA

A Pneumonia School.—According to the *Journal-Lancet* a pneumonia school available to physicians and laboratory technicians in western Montana was recently held at Montana State University, Missoula, under the auspices of the university and the state board of health. The speakers were Drs. Ernest D. Hitchcock, Great Falls; Meredith B. Hesdorffer, Missoula; Raymond F. Peterson, Butte; Burton K. Kilbourne, Helena, and Miss Edith Kuhns, Helena, director of the hygienic laboratory for the state board of health.

NEW JERSEY

New Committee to Control Cancer.—A New Jersey State Committee for the Control of Cancer has been organized to coordinate activities of lay and professional groups, under the auspices of the county medical societies and the American Society for the Control of Cancer. The committee aims to assist medical societies in securing facilities for the treatment of cancer as well as to carry on a campaign of educational publicity. Dr. Joseph H. Kler, New Brunswick, chairman for New Jersey of the American Society for the Control of Cancer, is also chairman of the new committee which is composed of representatives of both medical and non-medical groups.

NEW YORK

Smallpox Reported.—Smallpox has occurred in the village of Colonic, Albany County. The first case was in a man, never vaccinated, who conducts a gas station and trailer camp at stop 19 on the Albany-Schenectady Road. A systematic follow-up of all persons known to have been exposed to the gas station proprietor and his wife was carried out. Widespread publicity was given to the occurrence of these cases.

Personal.—Dr. George Emory Lochner, Albany, was guest of honor at a dinner March 15 given by the board of trustees of the Anthony N. Brady Maternity Home to celebrate his completion of fifty years in the practice of medicine. Dr. Lochner has been chief of staff of the Brady home since its establishment.—The Dutchess County Medical Society gave a dinner April 12 in Poughkeepsie in honor of Dr. Robert W. Andrews, who is moving to Texas after practicing in Poughkeepsie more than forty years. Dr. John C. McClintock, Albany, addressed the meeting of the society on thyroid problems.

New York City

Committee to Study Forensic Psychiatry.—The mayor has appointed a group of physicians and lawyers to serve as a committee to originate a plan of forensic psychiatry to pass on the mentality of persons under charges in New York courts, it is reported. The appointment was made when provision for pay for lunacy commissions was dropped in the city budget. The New York Academy of Medicine, the Bar Association of the City of New York and the New York County Lawyers Association will cooperate in the study which will be in charge of William B. Herlands, commissioner of investigation. Included on the committee will be Drs. John A. Hartwell and Israel Strauss, Mr. George Sylvester and Mr. Irving Braver.

Another Physicians' Orchestra.—Announcement is made of the formation of the Doctors Orchestral Society of New York. Officers are Drs. Leopold Glushak, president; William S. Thomas, vice president; Charles Auer, treasurer, and Harold S. Belcher, secretary. Ignatz Waghalter is the conductor. The society plans to hold its premiere in the Town Hall May 26 with Ernest Schelling, American pianist-composer, as soloist. The proceeds of the affair will be donated to the Physicians' Home and the Loan and Relief Fund of the Medical Society of New York. The program will include:

Overture to "Oheron"
Symphony No. 5 in E minor "From the New World"
Concerto for Piano and Orchestra in A minor
"Emperor" Waltz

Weber
Dvořák
Schumann
Strauss

Personal.—Dr. Chrisman G. Scherf, medical superintendent of Metropolitan Hospital, has been named to a similar position at the new Hospital for Chronic Diseases on Welfare Island, according to a recent announcement by the commissioner of hospitals, Dr. Sigismund S. Goldwater. The new hospital will open about July 1, it was stated. — Dr. Victor G. Heiser received the gold medal of the Holland Society of New York April 6 in recognition of his "distinguished service to public health." — Dr. Alexis Carrel of the Rockefeller Institute for Medical Research was awarded the gold service medal of the Rotary Club of New York April 13 "in recognition of a life devoted to the amelioration of human suffering." — Dr. Shirley W. Wynne, former health commissioner, has been named commissioner of the Manhattan Council, Boy Scouts of America. — Dr. Thomas M. Rivers, director of the Hospital of the Rockefeller Institute for Medical Research, has been appointed to the New York City Board of Health by Mayor La Guardia to succeed the late Dr. Carl Boettiger.

NORTH CAROLINA

District Meetings.—Dr. Bevcley R. Tucker, Richmond, Va., was the guest speaker at a meeting of the Second District Medical Society in Greenville April 13, on advancements in the treatment of the mentally ill. — The Fifth District Medical Society held a meeting in Lumberton April 6 with the following speakers, among others: Drs. David Henry Poer, Atlanta, on surgical management of goiter; James M. Ruffin, Durham, diagnosis and treatment of conditions causing bloody diarrhea, and Russell S. Beam, Lumberton, sulfapyridine in pneumococcal infections. — The Tenth District Medical Society met in Asheville March 31 in conjunction with the state board of health and the extension bureau of the University of North Carolina. Dr. Robert E. Seibels, Columbia, S. C., spoke on the care of pregnant women. Dr. Horton R. Casparis, Nashville, Tenn., spoke on care of children in infancy.

OHIO

Personal.—The John and Mary Markle Foundation, New York, has awarded a grant of \$4,100 to Dr. Carl J. Wiggers, professor of physiology, Western Reserve University School of Medicine, Cleveland, to study the nature of ventricular fibrillation. — Dr. Harry Goldblatt, Cleveland, recently received the "grand scientific award" of the Phi Lambda Kappa fraternity in recognition of his work on essential hypertension.

The Rachford Lectures.—Dr. Ernest W. Goodpasture, professor of pathology, Vanderbilt University School of Medicine, Nashville, Tenn., delivered the Benjamin Knox Rachford Lectures at the University of Cincinnati April 13-14. His subjects were "Experimental Virus Infections of the Chick Embryo" and "Experimental Bacterial Infections of the Chick Embryo." The Rachford Lectureship was established in 1929 in memory of Dr. Rachford, who organized the department of pediatrics in the university.

PENNSYLVANIA

Narcotic Addicts and Epileptics Barred from Driving.—More than 28,000 known narcotic addicts have been barred from obtaining licenses and driving permits in Pennsylvania. They will not be allowed to drive until they can show on competent medical authority that they are cured. The report also said that 5,000 applicants known to be subject to epilepsy have been refused permits and 259 are waiting for special hearings.

Philadelphia

Sectional Meeting on Physical Therapy.—The spring session of the American Congress of Physical Therapy, under the auspices of the New York Physical Therapy Society and the Pennsylvania Physical Therapy Association, was held at Jefferson Medical College, Philadelphia, April 22. Among the speakers were:

- Dr. John H. Willard, Abdominal Neuralgia.
- Dr. Karl Harpuder, New York, Physical Therapy in Peripheral Vascular Disease.
- Dr. Louis Kaplan, Physical Therapy in Fractures Treated with Unpadded Cast.
- Dr. Kristian G. Hansson, New York, After-Treatment of Infantile Paralysis.
- Dr. Abraham R. Hollender, Chicago, Controversial Problems in Nasal Laryngophoresis.
- Dr. Gustave Bucky, New York, New Developments in Grenz Rays.
- Dr. Jean Saldman, director, Institute of Actinology, Paris, New Methods of Physical Diagnosis and Physical Therapy.
- Dr. Joseph T. Beardwood Jr., Philadelphia, Newer Methods of Physical Therapy in the Treatment of Complications of Diabetes.

Pittsburgh

Second Renziehausen Lecture.—Frank G. Young, Ph.D., a member of the scientific research staff of the National Institute for Medical Research, London, England, delivered the second Renziehausen Memorial Lecture at the Mellon Institute April 24. His subject was "The Anterior Pituitary Gland Diabetes." These lectures were established recently by Miss Emilie Renziehausen in memory of her brothers.

SOUTH CAROLINA

Hospital News.—A new Oconee County hospital at Seneca was opened February 6 with accommodations for forty patients. Construction of the hospital was a WPA project representing an outlay of about \$75,000.

Society News.—Dr. Frederic W. Schlutz, Chicago, addressed the Columbia Medical Society in Columbia April 10 on "Sulfanilamide Therapy in Pediatric Practice" and Dr. LeGrand Guerry, Columbia, "Reconstruction of Bile Passages Based on a Study of Fifteen Consecutive Cases."

VIRGINIA

Personal.—William T. Sanger, LL.D., president of the Medical College of Virginia, Richmond, received the honorary degree of doctor of humane letters, from Bridgewater College April 3, when he made a Founder's Day address. Dr. Sanger will receive the degree of doctor of laws from the University of Richmond at its June commencement. — Dr. James Brooke Pettis, recently on the staff of the New Jersey State Hospital, Marlboro, N. J., has been appointed director of clinical psychiatry.

Society News.—Dr. Tiffany J. Williams, Charlottesville, addressed the Danville-Pittsylvania Academy of Medicine, April 11, on "Toxemias of Pregnancy." — Dr. Hugh C. Henry, Richmond, has been elected president of the Neuropsychiatric Society of Virginia; Dr. Thomas N. Spessard, Norfolk, vice president, and Dr. Edward H. Williams, Richmond, secretary. — Dr. Edwin C. Hamblen, Durham, N. C., was the guest speaker at the spring meeting of the Southwestern Virginia Medical Society in Bristol April 13 on endocrinology.

WASHINGTON

Hospital News.—A new Shriners' Hospital was dedicated recently in Spokane adjacent to St. Luke's Hospital, where the original building was erected in 1924. Erected at a cost of \$85,000, the new building will provide facilities for the care of crippled children.

Spokane Surgical Meeting.—Dr. Edward William Alton Ochsner, New Orleans, was the guest speaker at the annual meeting of the Spokane Surgical Society April 8. Dr. Ochsner gave the following addresses: "Peripheral Vascular Disease," "Thrombophlebitis" and "Surgical Significance of Amebiasis." Members of the society presented papers and conducted clinics.

Graduate Course.—The University of Washington announces its annual extension graduate medical course July 17-21. Instructors this year will include Drs. Andrew C. Ivy, Howard C. Ballenger, Newell C. Gilbert, George H. Gardner and Charles Marshall Davison, all of the staff of Northwestern University Medical School, Chicago. Clinics will be conducted at King County Hospital by local physicians.

WEST VIRGINIA

Personal.—Dr. Walter E. Vest, Huntington, will receive the honorary degree of doctor of science at the June commencement of the Medical College of Virginia, Richmond. Dr. Vest graduated from the college in 1909.

Society News.—Dr. Samuel Iglauer, Cincinnati, addressed the Ohio County Medical Society, Wheeling, April 21, on "Deep Infections of the Neck and Mediastinum." — Dr. Thomas E. Jones, Cleveland, addressed the Ohio County Medical Society April 7 on "Abdominoperineal Resection" and Dr. Leon Herman, Philadelphia, March 24, on "Urinary Infections in the Pregnant Woman." — Dr. Hugo Roesler, Philadelphia, addressed the Kanawha Medical Society, Charleston, April 11 on "Nonmechanical Diagnosis of Heart Lesions."

WISCONSIN

Society News.—Dr. John W. Harris, Madison, addressed the Milwaukee Society of Clinical Surgery March 28 on "An Evaluation of the Various Operative Procedures for the Correction of Uterine Prolapse" and Dr. Edmund H. Mensing,

Milwaukee, on "Prophylaxis of Peritonitis."—The Medical Society of Milwaukee County and the Milwaukee County Dental Society held a joint meeting March 10; the speakers were Dr. Elmer L. Sevringhaus, Madison, on "The General Features of Mineral Metabolism" and Isaac Schour, Ph.D., D.D.S., Chicago, "Calcification of the Tooth as an Index of the Constitutional Pattern of the Child."

GENERAL

American Board Examinations in Ophthalmology.—The American Board of Ophthalmology will conduct a written examination in various cities of the United States, in Honolulu, Puerto Rico and Canada August 5. Formal application for this examination must be received before July 1. General oral examination for successful candidates will be held in Chicago October 7. For information, write at once to the secretary, Dr. John Green, 6830 Waterman Avenue, St. Louis.

Awards for Chemical Research.—Among awards for research in chemistry for the academic year 1939-1940 by the Lalor Foundation, Wilmington, Del., are the following of medical significance: Otto Karl Behrens, Ph.D., Rockefeller Institute for Medical Research, New York, for work on chemistry of peptide metabolism; Andrew Calvin Bratton, Ph.D., instructor in pharmacology and experimental therapeutics, Johns Hopkins University School of Medicine, Baltimore, chemical aspects of chemotherapy of compounds of the sulfanilamide type.

Health Conference in Rio de Janeiro.—The eighth biennial conference of the Health Section of the World Federation of Education Associations will be held in connection with the congress of the federation in Rio de Janeiro, Brazil, August 6-11. A working conference is being developed in which all present will share experiences in health education, health services and physical education in the schools. Brief outlines of each paper will be read when the author, or a representative of his country, is present and before the close of each of the four sessions a summary of the papers and discussions will be presented and acted on by the group. Program and travel information can be obtained from the executive secretary, Health Section Secretariat, 200 Fifth Avenue, New York.

Association for the Study of Goiter.—The American Association for the Study of Goiter will hold its annual meeting in Cincinnati May 22-24. The tentative program includes the following speakers:

- Dr. Willard O. Thompson, Chicago, Management of Severe Thyrotoxicosis.
- Dr. Elmer C. Bartels, Boston, Coronary Disease in Myxedema.
- Dr. Douglas U. McGregor, Hamilton, Ont., Tuberculosis of the Thyroid Gland.
- Drs. Samuel F. Haines, Thomas B. Magath and Fred H. Powers, Rochester, Minn., The Hippuric Acid Test in Hyperthyroidism.
- Drs. Brien T. King and Frederick Lemere, Seattle, A New and Function-Restoring Operation for Bilateral Abductor Cord Paralysis.
- Dr. Warren H. Cole, Chicago, Anesthesia in Thyroidectomy with Special Reference to Avertin.
- Drs. Elliott C. Cutler and Stanley O. Hoerr, Boston, Avertin Anesthesia for Thyrotoxicosis.

Awards in National Traffic Safety Contest.—New Jersey won the grand prize for states and Providence, R. I., the grand prize for cities in the annual national traffic safety contest sponsored by the National Safety Council. All states and 1,163 cities participated in the contest. Three other states won first place in their geographic divisions: Oklahoma, Iowa and Washington. Six cities won awards in their population groups: Cleveland and Milwaukee tied among cities with populations of 500,000 or more; Trenton, N. J., 100,000 to 250,000; Saginaw, Mich., 50,000 to 100,000; Waukegan, Ill., 25,000 to 50,000, and Mason City, Iowa, 10,000 to 25,000. Providence won first place in the 250,000-500,000 population group. In addition to these awards the judges gave prizes and honorable mention and named a special honor roll of 157 cities with populations between 5,000 and 10,000 which went through 1938 without a traffic death. New Jersey cut its traffic deaths in 1938 to 885 from 1,378 in 1937. Providence had sixteen traffic deaths in 1938 as compared with forty-one in 1937. The average death rate for all prize winning cities in the contest was 9.9 per hundred million miles traveled; the national average for cities was 14.5. Scoring of the contest was based on a maximum score of 100 possible points. The motor vehicle death rate counted for 50 points and the remaining fifty points were divided among accident reporting systems, traffic engineering and enforcement, child safety programs and public education. Bronze plaques were presented to the governors of the states and mayors of the cities were presented at a dinner at the Mayflower Hotel, Washington, D. C., April 13.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 15, 1939.

Sulfapyridine in the Treatment of Pneumonia

The use of sulfapyridine for pneumonia is the leading therapeutic topic of the day. At the Royal Society of Medicine Dr. L. E. H. Whitby said that the efficacy of this drug had been fully confirmed. Provided the patient could live for twenty-four hours and retain some 5 Gm. the chance of success was greatly increased, whatever the day of the disease on which the treatment was begun. The scheme of dosage of Gaisford and Evans, from 4 to 5 Gm. the first twenty-four hours and 3 Gm. daily thereafter to a total of 25 Gm., was the usual one followed. Stopping administration of the drug within four days was followed by an exacerbation, which in animals was difficult to control. Whether passive immunization with serum or active immunization with vaccine should be combined with the use of sulfapyridine was difficult to say. Patients treated on the fifth day and afterward required only 15 Gm. to produce a crisis and cure. The basic indication for the drug was a definite coccic infection. It had no action on influenza. Its chief disadvantage was gastric irritation and vomiting in about 30 per cent of cases.

Dr. W. F. Gaisford reported a year's hospital experience with sulfapyridine in which he had treated between 600 and 700 patients suffering from infections of the respiratory tract. Of these 400 had lobar pneumonia. Children under the age of 5 years and patients dying within twelve hours of admission to the hospital were not included in the statistics. The total mortality dropped from 23 per cent before the use of the drug to between 6 and 7 per cent. In patients over 50 the drop was from 50 to 24 per cent; in patients under 50, from 17 to 1.6 per cent. In nearly all cases the effect on the temperature was shown by a fall to normal within forty-eight hours of the beginning of treatment. Continuance of pyrexia indicated either a complication or an organism that was not the pneumococcus. There was no indication of any alteration in the rate of resolution. The general condition rapidly improved after the fall in temperature. Toxic effects of the drug were slight, rashes similar to but less severe than those produced by sulfanilamide. Cyanosis was observed in some cases, but it ceased to be a worrying sign. Vomiting sometimes occurred but was rarely so persistent as to prevent retention of a sufficient dose of the drug.

Prof. Alexander Fleming said that sulfapyridine did not seem to kill the pneumococcus, which presumably was killed by the natural defenses of the body. The mortality might be still further reduced if patients were immunized when the drug was given. There was not much time to develop active immunity, but animal experiments indicated that not much active immunity was required when combined with drug treatment.

Dr. Maurice Davidson sounded a note of warning against the indiscriminate way the sulfanilamides were being used by the junior members of the profession. We were not yet in a position to say that they did not cause damage. A drug so potent as to be able to deal effectively with a virulent organism might possibly damage renal epithelium or even the myocardium. The president, Dr. H. L. Tidy, said that the responsibility for the wild use of these drugs in general practice lay with the travelers of drug firms.

Operation for Paralyzed Muscles

The physiologist Prof. W. A. Osborne of Melbourne, in conjunction with Basil Kilvington, showed in 1907 that the regenerating fibers of the cut sciatic nerve of the dog do not travel down the original paths but even cross from one division

to another. The Australian surgeon N. D. Royle has ingeniously turned this pathologic fact to account in the treatment of paralysis (*M. J. Australia* 1:227 [Feb. 11] 1939). He points out that in anterior poliomyelitis degeneration of a peripheral nerve may follow degeneration of the spinal neuron and that the nerve trunk may contain both normal fibers and sheaths with degenerated fibers. If the nerve is interrupted and allowed to regrow, some healthy fibers will grow into sheaths containing degenerated fibers and so reach the paralyzed muscles, which will regenerate, for Royle has obtained return of power in four successive cases. In one the tibialis anticus was paralyzed and in another all the muscles supplied by the median and ulnar nerves. In the latter case nerve suture and transplantation were performed, in addition to nerve section below the line of transplantation. Royle now adds another typical application.

A boy aged 4 had paralysis from injury of the brachial plexus at birth. There was loss of power in the hypothenar eminence and in the interosseus muscles of the left hand, but the muscles of the forearm supplied by the ulnar nerve had recovered. Royle exposed the ulnar nerve above the elbow and crushed it with strong artery forceps in several diameters so as to disorganize the axis cylinders. A year later the boy had regained power in the paralyzed muscles. The muscles considered by Royle suitable for this operation are the tibialis anticus, which in poliomyelitis often remains paralyzed when other muscles of the anterior tibial group recover, the intrinsic muscles of the thumb, the interossei, the peronei, individual muscles of the posterior peroneal group and any paralyzed muscle in an otherwise normal group. The crushing of the nerve must be done at some distance proximal to its first muscle supply. Thus in the common peroneal nerve it must be done at least 5 cm. above the origin of the supply of the muscles and in the ulnar nerve 1 inch or more above the elbow. The usual orthopedic practice is followed while recovery of the paralyzed muscles is being awaited.

PARIS

(From Our Regular Correspondent)

April 8, 1939.

Prevalence of Brucellosis in France

A report was presented at the February 21 meeting of the Académie de médecine de Paris by Drs. Dubois and Sollier on the incidence and prevention of brucellosis in France. More than 4,000 cases were reported last year, with a mortality of from 6 to 7 per cent. The disease is almost exclusively of animal origin. Of 100 cases, the infection originates in about eighty in sheep, in fifteen in goats and in only about five in cows. There is danger, however, of pigs acting as sources of infection. With the exception of certain portions of Brittany the disease has been reported from every department in France. The object of the report was to draw attention to the inefficacy of present sanitary laws against the disease and the necessity of vaccination of every person in an infected area. Experience has shown that only about one case in twenty or twenty-five is reported. Fortunately this does not have any serious results, because disinfection of the surroundings of the patients with brucellosis has been shown to be of little value. Interhuman contagion is exceptional. The chief value of a declaration of the disease is that it enables the authorities to discover new foci of animal brucellosis and thus enables human beings in that locality to be aware of the dangers surrounding them. Unfortunately, owing to the small number of cases reported by farmers, most of the centers of infection in sheep and goats remain undiscovered. The majority of the sanitary measures are inadequate because of certain circumstances, which include the fact that the mode of contagion is complex in animals; there are certain species which are specially susceptible and there is a possibility for the female to be apparently well and yet be a carrier to an unlimited degree.

VACCINATION

As to prophylaxis, efforts to vaccinate animals against the disease have given only negative results. In general only killed bacteria have been used, but Dr. Dubois has employed since 1934 living and virulent cultures of *Brucella abortus suis*. Sheep vaccinated by this method have resisted experimental brucellosis as well as a natural form of the disease. At the same time they have not been infectious for animals of the same species in spite of a contact of from one to two years. A study of 480 cases of undulant fever since 1930 shows that seven of eight persons were infected after direct or indirect contact with infected animals and only one of eight after ingestion of milk or cheese. It is impossible to avoid infection of persons whose daily work brings them into constant contact with infected animals. The only method of prophylaxis for human beings is the use of a polyvalent vaccine containing strains of *Brucella melitensis* of human, sheep and goat origin and also strains of *Brucella abortus bovis* and *suis*. The use of such vaccine was begun by the authors in 1929, and more than 5,000 persons have been vaccinated, of whom 3,800 were farmers and 1,200 persons engaged in slaughterhouses or veterinary work. The unquestionable value of this method of vaccination is shown by the fact that undulant fever was observed in numerous nonvaccinated persons, whereas those who had been equally exposed but previously vaccinated were immune.

BERLIN

(From Our Regular Correspondent)

March 27, 1939.

The New Wiener Medizinische Gesellschaft

In the train of events under the new régime in Austria the famous Gesellschaft der Aerzte, like many other time-honored organizations, has lately been dissolved. In 1937 the centenary of the society was celebrated in a manner befitting so illustrious a medical body. The greatest German names in the world of medicine enthusiastically participated in this celebration. The list of speakers and scientific lecturers was brilliant and in keeping with the accomplishments of the society and its reputation. But its continuance was not to be tolerated by the Nazi rulers of Vienna, and, like all other medical societies, it was disestablished, in the 101st year of its existence. In its stead a new Wiener medizinische Gesellschaft was created, designed to serve medical practitioners and scientific research. Naturally only Aryan doctors are admitted to membership and in addition foreigners who are unquestionably in sympathy with the régime. The plan of the new society includes sections for the various special disciplines to take the place of the former societies of specialists. There is also newly added a special section for military medicine. The president of the new society is no distinguished clinician; he is the Nazi district governor of Vienna, that is to say a politician who is also an official of the Nazi bureau of national health.

In his inaugural address, February 4, the new president himself stated that he was well aware that many representatives of science were not wholly in accord with the establishment of the new organization under political rather than under scientific auspices. The president is Dr. O. Planner-Plan. This political control has become necessary, he stated, because as district governor he is better informed about local public health affairs than any one else. Since he has the representatives of science at his beck and call, it is possible for him to draw on consultant opinion in any problem which may arise. As he put it, "Prominent representatives of the various specialties may be commissioned to give an opinion with regard to any questions, and thus their abundant knowledge will be made to serve the nation's health." Dr. Planner-Plan's address was embroidered with a wealth of detail, which may be briefly summarized: The present speedy tempo of the national work program in Germany

not only should be maintained but should be surpassed. This means that a maximal expenditure of energy will be demanded of all German workers and soldiers. A further objective is conservation of the prolonged efficiency of the nation's workers. In this connection the physicians have an important mission to fulfil. Specializing physicians, too, have their respective duties, which the president went on to enumerate.

At each session of the new society a lecture and demonstrations will be given. It is further planned to correct certain bad features of medical practice; above all, an endeavor will be made to effect better collaboration between directors of clinics and specialists active as consultants.

THE NAZI CREED WITH REGARD TO MEDICINE

The principal address at the inaugural session was delivered by Prof. Franz Hamburger, ordinarius in pediatrics (and successor of Pirquet), long known for his Nazi sympathies. He climaxed his talk with the following pronouncement: "National socialism means a revolution in every sphere of our civilization and culture. No phase of western culture is unaffected by it. Most noteworthy of all, and what must remain most noteworthy, is the revolution in the realm of medical science, in the field of public health." The speaker went on to say that, despite the achievements of natural science within the past 150 years, medicine had been on the wrong track. "Medicine has now progressed beyond its old frontiers and has broken out of its shell, thanks to the philosophy and deeds of the führer." The healing art of yesterday has become the planned hygiene of today, the medical knowledge of mankind. Thus pediatrics becomes the medical study of children, gynecology the medical study of women, and so on. "With admirable clarity and logic the führer points the way into these fields, 'like a physician by the grace of God he shows us the path to health.'" The rubbish of which physicians must free themselves is the dross of misapplied science, that pseudoscience in medicine which opposes itself to the clearly ascertainable facts of everyday experience. Hamburger then assailed "that freedom from preconception" which has been such a source of pride. "A real renaissance of medical science, on Nazi foundations, must take place." That which is taught by university professors must be completely founded on the tenets of the Nazi program of life and health. "This should be easier for him (the teacher) because national socialism rests on an absolutely sound biologic basis." The chief spokesmen of the various medical disciplines at the universities must be confirmed Nazis; this applies especially to clinicians. Hamburger went on to deprecate the "arrogance of physicians" and to put in a good word for "nature medicine," which, he said, ought not to be too lightly esteemed. "National socialism, unlike any other political philosophy or party program, is in accord with the natural history and biology of man. And because national socialism considers all known physiologic data from nature and from human behavior, it merely represents truths about man. It is accordingly well suited to the direction of the health of our people." Hamburger then turned his fire in succession on Catholicism, liberalism and socialism. He next entered into a discussion of several general problems, in the course of which he said that only a wrongly educated, intellectually biased patient would wish to know the diagnosis—and more along the same line.

Gain in Weight Among Soldiers

The status of body weight is a good measuring rod for the evaluation of the health of youthful persons. Interest therefore attaches to a recent report published by a ranking health officer, Colonel-Surgeon Dr. H. Müller of the sanitary corps of the army. All recruits are weighed during the first half year of their service monthly and later quarterly. The weight is recorded each time in the health statistics of the troops. To obtain an idea of the trends in body weight among young soldiers of the

entire reich, statistics on the routine weighings have been compiled by the army health inspector (namely the highest officer in the medical corps in peace time). In the summer of 1936 separate reports were compiled on the recruits who had entered service in November 1937 and soldiers who had already served one year. For both groups the body weight at the time of enlistment was compared with the body weight in the summer of 1938. This represented the first time that such a complete record had been made. The observations were as follows: After the first half year of military training, 70 per cent of the recruits had gained weight, the weight of 10 per cent remained the same and 20 per cent had lost weight. The corresponding figures for men at the end of one year's service were: gained weight 73 per cent, weight stationary 9 per cent and lost weight 18 per cent. It was thus ascertained that in general the tendency to gain weight ends after the first half year. For the entire army the mean increase in weight during the first year amounted to around 3 Kg.

AUSTRALIA

(From Our Regular Correspondent)

March 29, 1939.

Another Plan Replaces National Health Insurance

Following the commonwealth government's decision to abandon its scheme for national health insurance as embodied in the National Insurance Act of 1938, it is intended to substitute a medical service plan. In view of the increased and increasing liabilities incurred on account of defense measures (£500,000 a week in Australia) and the prospective additional cost of liberalizing the national insurance plan as laid down in the act, together with a decreased ability on the part of the government and the people of Australia to meet the cost of maintenance of the scheme, the government has decided to repeal entirely the pension provisions of the act. There remains a system of health insurance and family medical benefit. Details of the scheme have not been determined, but the weekly contribution of 1 shilling sixpence each from employer and employee as provided in the present act is to be reduced approximately by half. It is intended to continue the approved society system and the cash health benefits on substantially the same scale as is now provided. But the whole question of medical benefit is to be discussed first with representatives of medical benefit organizations and of the medical profession and later with the consultative council of approved societies. The announcement that the health service is not to be abandoned makes the matter acute once more for general practitioners in Australia. Now, however, they are well organized to present a united front against governmental aggression and to press their arguments for control of medical services by a board composed mainly of medical men, for the reduction of the income limit for insurance patients, and for the acceptance of certificates and prescriptions from any registered practitioner. It is obvious from a survey of the legislative background in Australia that any hope of finality in the arrangements for "national" insurance is remote.

New Development in Maternity Service

To reduce further maternal mortality figures, the health department of New South Wales has made available better medical facilities for mothers during the puerperal period. Antepartum and postpartum facilities have been set up and are expanding. The scheme now propounded will cover the vital intermediate period. Arrangements include an agreement with the state branch of the British Medical Association whereby the services of accredited obstetric consultants will be made available in any abnormal maternity case, no matter what the financial circumstances of the patient may be, and the establishment of a mobile blood transfusion unit which

will be attached to one of the metropolitan hospitals. Blood donors will be paid at the rate of £5 for every pint of blood taken from them, and the whole of this cost, together with that of bringing in specialists, will be borne by the department of public health. Furthermore, any maternal death occurring will be reviewed within a reasonable time by a special committee, with a view to discovering any loopholes in the scheme and thus to reduce the rate of any similar happening in the future.

Extension of Pharmaceutic Training Suggested

With the advent of New Zealand's social security act of 1938, it becomes imperative that increased laboratory facilities for diagnosis and treatment be made readily available to medical practitioners throughout the country. Rather than bring into existence some new organization, it would be preferable if this were undertaken by an existing body having contact with both the physician and the patient, and for this reason it has been suggested that pharmacists suitably trained in the practice of biochemical analysis would be able to give this service to the state. Such an arrangement insures adequate laboratory services in a form easily available to physician and patient.

The first requisite in any such plan would be to insure an adequate standard among those pharmacists who undertook the work. A diploma of biochemical analysis would certify that the holder was qualified to carry out the work by virtue of his having passed examinations in the subject. Only those pharmacists who held such a diploma would be qualified to carry out this work, and the tests would be performed only on the order of a qualified medical practitioner. As the pharmacist already has the foundations of the required knowledge of general chemistry and of chemical analysis, it appears that he would be the logical person to train for the work.

The scope of the work would include (1) urinary tests and estimations (routine chemical examination, urea concentration test, quantitative analyses for sugar, albumin and chlorides, test of the diastatic activity and fermentative sugar test), (2) blood analyses (dextrose tolerance test, urea estimation and estimation of total nonprotein nitrogen), (3) serum analyses (test for calcium, cholesterol and phosphates, quantitative Van den Bergh test, qualitative Van den Bergh test and protein estimation), (4) fecal analyses (detection of occult blood and estimation of fats) and (5) fractional gastric analyses.

This suggestion has been greeted by various critics. While the scheme may look well on paper, practical laboratory experience suggests that there is an element of false security inherent in the proposal. The absence of immediate medical direction for this type of work and the lack of interpretative facilities may lead to error. The range of biochemical work also warrants a turnover, an equipment and a degree of application which are unlikely to be found in even a well equipped pharmacy. The tendency in Australia is to employ a technician of the caliber of a bachelor of science to do this type of work in conjunction with a technician or, sometimes, to combine the two positions when the turnover is limited. But in either case medical direction is given to the work. The suggestion also affects the future of the medical graduate who has specialized in pathology and biochemistry. While the "pathologic unit" working in a well equipped laboratory finds ample scope in towns of a population of about 100,000, a difficulty arises as to what type of unit is suitable for towns and districts of smaller population. Here a better solution of the problem would be the establishment of "pathologic units" at strategically selected centers: the problems of distance between the unit and the scattered practitioners being overcome by modern methods of communication and transport, including the airplane. The pharmaceutic chemist could still be used, but over a much more limited range of technical activities.

BELGIUM

(From Our Regular Correspondent)

Feb. 16, 1939.

Congress of Neurology and Psychiatry

The Congress of Neurology and Psychiatry, organized by neurologic and psychiatric societies of Belgium and the Netherlands, held its sessions at Ghent and at Brussels under the chairmanship of Prof. C. U. Ariens Kappers. In the first paper the literature of dementia praecox and the encephalitides was reviewed. Dr. Guillaume Vermeylen said that numerous cases of psychoses and notably of dementia praecox have as their basis an encephalitis. These encephalitides often develop insidiously and their nature is as yet poorly defined. They may be the result of a direct influence of the virus or of a state of asthenia which permits a neurotropic virus to become virulent. Moreover, these divergent hypotheses assume a diminution of resistance in the hemato-encephalic barrier. The more highly developed the patient's psychosis, the more diffuse is the cerebral process; and the slower the development of the process, the greater the chances that organized psychoses will be observed to develop.

The second paper dealt with parenchymatous disorders of the cerebellum. Bernard Brouwer and Arie Biemond hold the opinion that the cerebellum is an organ of association for the proprioceptive system and consequently an organ of coordination, above all for the involuntary movements. The activity of the cerebellum renders the movements quicker and easier, since at the cerebellar level no associations of another order come to disturb its functioning, as happens at the level of the hemispheres. The latter may interfere at any time with the physiologic activity of the cerebellum and thus modify the mechanism of motility, but they cannot completely replace the cerebellum in this function.

Occupational Dermatoses

Dr. Henri Halkin has published in the *Liège médical* an article on occupational dermatoses. Certain dermatoses are truly based on the occupation proper, whereas the environment is of minor importance in their manifestation. The principal disorders are due to cement and lime in general, to chromium and the chromates, and to concentrated acids or alkalis, and to globules of oil. Nearly 80 per cent of cutaneous accidents are occupational dermatoses, cutaneous reactions in Brocq's sense of the term. However, in addition to an external cause, there usually is a general disturbed condition of the patient's equilibrium. This concept may be invalidated as soon as more information has been obtained with regard to the phenomena of sensitization.

Ernest Malvoz

Dr. Ernest Malvoz, the recently deceased professor of bacteriology at the University of Liège, was a pioneer in social medicine. For him the highest humanitarian duty was "to combat the three greatest scourges: ignorance, poverty and disease."

Marriages

MARION KEMPER HUMPHRIES JR., Charlottesville, Va., to Miss Zaida Pettit Thomas of Wytheville, April 15.

ARTHUR C. JOHNSON, Omaha, to Mrs. Lotus Hulsebus of Pasadena, Calif., at Las Vegas, Nev., February 17.

CLEMENT P. O'NEILL, Rock Island, Ill., to Miss Baptista Hammer of Davenport, Iowa, April 10.

RUSSELL LEE NORBURN to Mrs. Hope Robertson Colthup, both of Asheville, N. C., April 10.

CHARLES SCOTT MILLER to Miss Ethel Atkinson, both of Philadelphia, recently.

JACOB SALVATORE DIGATE to Miss Edith Alberts, both of Chicago, March 18.

HARRY SHUBIN to Miss Celia Fierman, both of Philadelphia, July 9, 1938.

Deaths

Arthur H. Harrington ☉ Providence, R. I.; Jefferson Medical College of Philadelphia, 1882; an Affiliate Fellow of the American Medical Association, past president of the Rhode Island Medical Society; member of the American Psychiatric Association and the New England Society of Psychiatry; medical director of the Bridgewater (Mass.) State Hospital, 1894-1898, superintendent of the Danvers (Mass.) State Hospital, 1898-1903, New York Eye and Ear Infirmary, 1903-1907, and State Hospital for Mental Diseases, Howard, 1907-1926; aged 82; died, March 12, of arteriosclerosis and coronary occlusion.

John W. Burns ☉ Cuero, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1891; member of the House of Delegates of the American Medical Association, 1922-1932, 1934-1938, and since 1937 member of the Judicial Council; past president of the State Medical Association of Texas and the De Witt County Medical Society; fellow of the American College of Surgeons; formerly member of the state board of health; medical director of a hospital bearing his name; aged 72; died, May 1.

Charles B. Barker, Guthrie, Okla.; Chicago College of Medicine and Surgery, 1912; member of the Oklahoma State Medical Association and the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; aged 54; died, February 12, in St. Anthony Hospital, Oklahoma City, of streptococcal septicemia.

Martin Donelson ☉ Medical Inspector Commander, U. S. Navy, retired, Danville, Va.; University of Virginia Department of Medicine, Charlottesville, 1906; member of the American Urological Association; entered the navy in 1907 and retired in 1935 for incapacity incident to the service; aged 56; was found dead, February 9, of a bullet wound.

Jules Baechler, West New York, N. J.; Columbia University College of Physicians and Surgeons, New York, 1907; member of the Medical Society of New Jersey; for many years medical examiner for the public schools; aged 61; died, February 11, in the North Hudson Hospital, Weehawken, of cerebral hemorrhage and hypostatic pneumonia.

Lester Jarvis Benson, Lakewood, Ohio; Chicago Homeopathic Medical College, 1903; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; honorary member of the staff of the Lakewood City Hospital; aged 78; died, February 12, of acute pulmonary edema and osteoarthritis.

William Chestnut, Winnipeg, Man., Canada; Manitoba Medical College, Winnipeg, 1898; professor emeritus of medicine at his alma mater; for many years on the honorary attending staff and formerly medical superintendent of the Winnipeg General Hospital; aged 71; died, February 7, of coronary occlusion.

Cornelia Bernhardine Johanna Schorer ☉ Foxboro, Mass.; Universität Zürich Medizinische Fakultät, Switzerland, 1897; an Affiliate Fellow of the American Medical Association; member of the American Psychiatric Association; formerly on the staff of the Foxboro State Hospital; died, January 9, in Berlin, Germany.

Reynolds May, Whitewright, Texas; University of Louisville (Ky.) Medical Department, 1878; member of the State Medical Association of Texas; past president of the Grayson County Medical Society; formerly member of the board of education; aged 87; died, January 2, in a hospital at Sherman of heart disease.

Reuben C. Burrow, Cunningham, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1891; Eclectic Medical Institute, Cincinnati, 1894; member of the Kentucky State Medical Association; past president and secretary of the Carlisle County Medical Society; aged 70; died, February 2, of pneumonia.

Walter Barwick Bruce, Helena, Ark.; University of the South Medical Department, Seawane, Tenn., 1901; member of the Arkansas Medical Society; county health officer; for many years member of the board of trustees of the University of the South, Seawane, Tenn.; aged 65; died, February 22, of cerebral hemorrhage.

Amos H. Caffee ☉ Terre Haute, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1900; past president of the Vigo County Medical Society; secretary of the city board of health; served during the World War; on the staff of the Union Hospital; aged 73; died, February 1, of coronary thrombosis.

Frank Joseph Alessi, Niagara Falls, N. Y.; University of Buffalo School of Medicine, 1929; on the staffs of the Memorial Hospital and St. Mary's Hospital, Niagara Falls, and the Millard Fillmore Hospital, Buffalo; aged 34; died, January 10, in Saranac Lake of pulmonary tuberculosis.

Justin M. De Ford, Rossburg, Ohio; Cincinnati College of Medicine and Surgery, 1892; member of the Ohio State Medical Association; for many years member of the local board of education and at one time member of the county board of education; aged 82; died, March 4, of pneumonia.

William Heilman Hossler, Staten Island, N. Y.; Medical College of Ohio, Cincinnati, 1907; formerly acting assistant surgeon in the United States Public Health Service, Immigration Department; aged 59; died, January 13, in the United States Marine Hospital of diabetes mellitus.

Edward Homer Egbert, St. Simon Island, Ga.; Baltimore Medical College, 1905; member of the Medical Association of Georgia; served during the World War; formerly surgeon to the Huggins Hospital, Wolfboro, N. H.; aged 57; died, February 27, of coronary thrombosis.

John H. Fletcher, Wichita Falls, Texas; St. Louis College of Physicians and Surgeons, 1905; veteran of the Spanish-American and World wars; city health officer and formerly county health officer; aged 60; died, January 29, in a local hospital of cirrhosis of the liver.

Robert Jasper Alexander ☉ Waco, Texas; Memphis (Tenn.) Hospital Medical College, 1891; fellow of the American College of Surgeons; on the staffs of the Providence and Central Texas Baptist sanitariums; aged 72; died, February 20, of acute hypostatic pneumonia.

Philip James Reichmann, Oakwood, Mo.; St. Louis College of Physicians and Surgeons, 1911; member of the Missouri State Medical Association; aged 61; died, January 11, in St. Elizabeth's Hospital, Hannibal, of diabetes mellitus and gangrene of the left foot.

William Thomas Asher, Atlanta, Ga.; Atlanta Medical College, 1893; member of the Medical Association of Georgia; on the staffs of St. Joseph Infirmary and the Grady Hospital; aged 67; died, February 7, of cerebral thrombosis and cerebrovascular degeneration.

Alfred Mitchell Merriman ☉ Bristol, R. I.; Medical School of Maine, Portland, 1895; at one time medical inspector of the public schools; formerly on the staff of the Rhode Island Soldiers' Home; aged 70; died, January 9, in the Jane Brown Hospital, Providence.

John Norris Doyle, Wausau, Wis.; Marquette University School of Medicine, Milwaukee, 1915; member of the State Medical Society of Wisconsin; served during the World War; aged 53; died, February 4, in a hospital at Temple, Texas, of pneumonia.

Charles Daligny, Troy, N. C.; Université de Paris Faculté de Médecine, France, 1878; member of the Medical Society of the State of North Carolina; served in the Franco-Prussian War; aged 85; died, January 8, of carcinoma of the prostate and uremia.

Howard Newell Baker, Pierson, Iowa; Hahnemann Medical College and Hospital, Chicago, 1905; member of the Iowa State Medical Society; formerly a member of the board of education; aged 57; died, February 8, of cerebral hemorrhage.

Charles Joseph King, Langdon, N. D.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; Dearborn Medical College, Chicago, 1906; aged 59; died, January 31, of coronary occlusion.

Chester Roy Brigham, Polo, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1905; member of the Illinois State Medical Society; served during the World War; aged 66; died, February 27, of coronary thrombosis.

Clarence Hathorne Staples, Malden, Mass.; Harvard University Medical School, Boston, 1904; member of the Massachusetts Medical Society; on the staff of the Malden Hospital; aged 60; died, January 17, of cerebral hemorrhage.

Marcus James Greenlee, Sewickley, Pa.; Howard University College of Medicine, Washington, D. C., 1937; aged 28; died, January 24, in the Suburban General Hospital, Bellevue, of skull fracture received in an automobile accident.

Lincoln Riegel Light, Lebanon, Pa.; Jefferson Medical College of Philadelphia, 1892; member of the Medical Society of the State of Pennsylvania; aged 71; died, January 12, of cerebral hemorrhage, arteriosclerosis and hypertension.

Archibald D. Campbell, Richland Center, Wis.; Louisville (Ky.) Medical College, 1896; aged 73; on the staff of the Richland Hospital, where he died, February 18, of bronchopneumonia, arteriosclerosis and chronic myocarditis.

John James Lindsay, Spartanburg, S. C.; University of Maryland School of Medicine, Baltimore, 1887; member of the South Carolina Medical Association; aged 73; died, January 5, at the Spartanburg General Hospital.

Edward Joseph Howland © Colchester, Conn.; University of Vermont College of Medicine, Burlington, 1911; served during the World War; for many years health officer; aged 58; died, January 25, of coronary thrombosis.

Lee H. Duguid, Michigan Center, Mich.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1898; served during the World War; aged 66; died, January 8, in the United States Marine Hospital, Detroit.

William Frederick Vilter, Cincinnati; Medical College of Ohio, Cincinnati, 1901; member of the Ohio State Medical Association; on the staff of the Deaconess Hospital; aged 62; died, January 21, of lymphatic leukemia.

Frank Edward Tompkins, Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1899; aged 62; died, January 1, in the Boro Park General Hospital of chronic nephritis and uremia.

Thomas Francis Shinnick, Beloit, Wis.; Rush Medical College, Chicago, 1899; member of the State Medical Society of Wisconsin; served during the World War; aged 65; died, January 29, of heart disease.

John Stephen Thompson, Winterport, Maine; Georgetown University School of Medicine, Washington, 1895; aged 75; died, January 8, in Antigonish, N. S., of anemia and acute dilatation of the heart.

Charles Lewis Hawkins © Taft, Calif.; Jefferson Medical College of Philadelphia, 1900; member of the American Urological Association; aged 68; died, January 14, of abscess about the ampulla of Vater.

Ada Scott Conner Morton, Fall Brook, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; aged 59; died, January 11, of angina pectoris.

William Lincoln Shawk, Rockaway Beach, Calif.; Western Reserve University Medical Department, Cleveland, 1883; aged 78; died, January 7, of arteriosclerosis and cerebral hemorrhage.

Winfield Howard Ames, Milford, N. H.; Syracuse University College of Medicine, 1893; aged 70; died, January 25, of abscess of the axilla following injury by crutch, and hemophilia.

Ross David Long, Oklahoma City; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1899; aged 69; died in January of cerebral arteriosclerosis.

Joe Johnson Taylor, Riverside, Calif.; American Medical College, St. Louis, 1893; St. Louis College of Physicians and Surgeons, 1908; aged 72; died, January 6, of chronic myocarditis.

Jefferson Davis Duke, Heflin, Ala.; Southern Medical College, Atlanta, Ga., 1884; member of the Medical Association of the State of Alabama; aged 77; died, February 12, of hemiplegia.

William Patrick Brogan, Tyler, Texas (licensed in Texas, under the Act of 1907); member of the State Medical Association of Texas; aged 67; died, January 6, of arthritis deformans.

Charles Leona Badger, Indianapolis; Indiana University School of Medicine, Indianapolis, 1911; aged 69; died, February 5, in St. Vincent's Hospital of an overdose of a narcotic.

Kenneth Paul Hunter, Wapello, Iowa; State University of Iowa College of Medicine, Iowa City, 1927; served during the World War; aged 39; died, January 15, of heart disease.

Frank Milton Hamblin, Bristol, Conn.; New York Homeopathic Medical College and Hospital, 1899; aged 65; died, January 30, in a hospital at Middletown of arteriosclerosis.

James Johnson Ellis, Knoxville, Tenn.; Tennessee Medical College, Knoxville, 1899; member of the Tennessee State Medical Association; formerly state senator; aged 80; died, January 5.

John A. P. Shields, Hartford, Tenn.; Chattanooga Medical College, 1902; member of the Tennessee State Medical Association; formerly state senator; aged 69; died, January 17.

David C. Trach © Kresgeville, Pa.; College of Physicians and Surgeons, Baltimore, 1891; aged 71; died, January 8, in the University of Pennsylvania Hospital, Philadelphia.

Nelson Du Val Brecht, Washington, D. C.; George Washington University School of Medicine, Washington, 1906; aged 54; died, February 15, of a self-inflicted bullet wound.

Joseph McClanahan Cornett, Temple, Texas; Baylor University College of Medicine, Dallas, 1934; intern at the Scott and White Hospital; aged 24; died in January.

Edward Sax Drucks, Oakland, Calif.; College of Physicians and Surgeons of San Francisco, 1907; member of the California Medical Association; aged 55; died, January 9.

James Krauss, Boston; Boston University School of Medicine, 1889; fellow of the American College of Surgeons; aged 72; died, January 29, of bronchopneumonia.

Joseph Price Dancy, Detroit; Howard University College of Medicine, Washington, D. C., 1920; aged 44; died, February 13, in the Parkside Hospital of meningitis.

Frank Joseph Doyle, Baltimore; Georgetown University School of Medicine, Washington, D. C., 1901; aged 60; died, February 5, of valvular heart disease.

Ellis Reynolds Shipp, Salt Lake City; Woman's Medical College of Pennsylvania, Philadelphia, 1878; aged 92; died, January 31, of carcinoma of the neck.

William S. Manners, San Leandro, Calif.; Northwestern Ohio Medical College, Toledo, Ohio, 1888; aged 82; died, January 28, of chronic myocarditis.

James H. West, McCrory, Ark. (licensed in Arkansas in 1905); aged 59; died, January 29, in the Baptist Hospital, Memphis, Tenn., of heart disease.

Calvin S. De Voll, Fort Worth, Texas; Metropolitan Medical College, Chicago, 1900; aged 86; died, February 19, of uremia and cardiorenal disease.

Osborne Elliott Carr, Owen Sound, Ont., Canada; University of Toronto Faculty of Medicine, 1913; aged 52; died, February 23, of heart disease.

Julian Philip M. Johnson, Yuba City, Calif.; State University of Iowa College of Medicine, Iowa City, 1910; aged 65; died, January 25, in India.

Jacob Koronefsky © New York; Columbia University College of Physicians and Surgeons, New York, 1900; aged 69; died, January 16.

John Clemons Lancaster, Houston, Texas (licensed in Texas under the Act of 1907); aged 87; died, January 31, of bronchopneumonia.

Alice Maud Gray, Boston; Tufts College Medical School, Boston, 1900; member of the Massachusetts Medical Society; died, January 17.

Vincent Millasich, Fresno, Calif.; California Medical College, San Francisco, 1906; aged 81; died, January 28, of cerebral hemorrhage.

Ulysses S. Ammerman, Reynolds, Neb.; Keokuk (Iowa) Medical College, 1898; aged 74; died, January 19, of coronary thrombosis.

William Noble Nanney, Whittier, Calif.; Medical College of Evansville, Ind., 1878; aged 85; died, January 12, of chronic myocarditis.

George Henry Baker, Long Branch, N. J.; Albany (N. Y.) Medical College, 1886; aged 84; died, February 8, of bronchopneumonia.

Stuart Eccles Beech, Salmon Arm, B. C., Canada; Manitoba Medical College, Winnipeg, 1911; aged 54; died, January 29.

William O. Curlee, Lubbock, Texas (licensed in Texas, under the Act of 1907); aged 62; died, February 7, of coronary disease.

Stephen Sinclair Slauenwhite, Windsor, N. S., Canada; Halifax (N. S.) Medical College, 1896; aged 72; died, January 12.

Arthur E. Fraleigh, St. Mary's, Ont., Canada; Western University Faculty of Medicine, London, 1892; died, January 17.

Morton Lake Hooper, Goldsboro, N. C.; Baltimore Medical College, 1887; aged 81; died, January 22, of chronic myocarditis.

John W. J. Newman, Buchanan, Ga.; Atlanta Medical College, 1893; aged 73; died in January of heart disease.

Charles H. A. Meyer, Baltimore; Baltimore Medical College, 1888; aged 78; died, January 1, of heart disease.

Marjory Ward, Renfrew, Ont., Canada; Trinity Medical College, Toronto, 1894; aged 68; died, January 25.

Robert G. Turner, Nacogdoches, Texas (licensed in Texas, under the Act of 1907); aged 62; died, January 2.

Gardner Spring Chapin, Los Angeles; Rush Medical College, Chicago, 1903; aged 59; died, January 1.

Correspondence

A PROGRAM FOR THE REFUGEE PHYSICIAN

To the Editor:—The purpose of this statement is to inform the medical profession at large of the facts concerning refugee physicians in this country and to offer a just and reasonable program to resolve the existing problem to the mutual advantage of the communities in which they are seeking shelter and of the émigrés themselves.

Until recently current misconceptions about the facts and a lack of understanding of the nature of the situation have added needless difficulties and complications. The committee hopes that this statement will serve primarily to clarify the facts in order to provide a better spirit of understanding in terms of mutual responsibility.

THE FACTS

During the period from July 1, 1934, to Dec. 1, 1938, corresponding to the time of the National Socialist régime in Germany, 1,528 physicians have migrated to the United States from Greater Germany.

The official figures covering this period are the following:

July 1, 1934, to July 1, 1935.....	104
July 1, 1935, to July 1, 1936.....	253
July 1, 1936, to July 1, 1937.....	286
July 1, 1937, to July 1, 1938.....	365
July 1, to Dec. 1, 1938.....	520
	<hr/> 1,528

Of this number, approximately 25 per cent are Catholic or Protestant and 75 per cent are of Jewish or partly Jewish origin.

There are at present 170,000 physicians in the United States, and our own medical schools graduate 5,500 new physicians each year. Despite this, the number of physicians in relation to the general population has been steadily decreasing, from 1 to 662 in 1886 to 1 to 784 in 1934.

THE PROBLEM IS SELF LIMITED

On the basis of the situation abroad, there will be a substantial reduction in the number of refugee physicians entering this country in future years, since:

1. Those who now apply for admission to this country must wait three or four years for their quota numbers to become available.

2. An indication of the limited nature of the problem is furnished by official Berlin statistics, published in the Sept. 17, 1938, issue of *THE JOURNAL*, revealing that there were fewer than 2,500 Jewish doctors left in Germany proper on July 1, 1938. Of these some have since emigrated to all parts of the globe. Approximately 700 have permits to practice among the Jews left in Germany. It is estimated that there are hardly more than 1,000 potential medical emigrants in Germany itself. In this connection, an item in the *New York Times* of April 26, 1939, dealing with Jewish emigration from Germany, is of particular interest: "Significantly enough, the only Jews whose emigration is being discouraged are physicians, especially surgeons, who might prove useful in case of war."

The quotas for admission to the United States from Poland, Hungary, Rumania and Czechoslovakia are so small that in any one year not more than an aggregate of 200 to 300 physicians could possibly enter from these countries.

3. Many of the Jewish physicians remaining in Germany are advanced in years. Many are close to the age of retirement.

4. Students of the type who later might have to emigrate can no longer enter the medical schools in Greater Germany, Czechoslovakia, and so on. In the eastern European countries, restriction of entry for such students in medical schools has been in practice for years, and we need anticipate no significant immigration of physicians into the United States from these countries.

The peak load has clearly been passed. The concentration of the refugees on the Eastern Seaboard has created an exaggerated

impression of their actual numbers, either present or future. Therefore the committee feels that the question has now become one of the proper selection and distribution of a limited number of physicians and that an adequate and practical solution can be found based on a carefully studied and administered plan.

THE STRUCTURE

The Committee for the Resettlement of Foreign Physicians has been organized under the egis of the nonsectarian National Coordinating Committee for Aid to Refugees. Since New York City is the port of entry for the large majority of immigrants the central office is located at 165 West Forty-Sixth Street. However, there is a national committee composed of representatives of members of the local committees, such as the Boston Committee on Medical Emigrés (Dr. David Edsall, chairman), the Baltimore committee (Dr. John M. T. Finney, chairman), and the Chicago committee (Dr. Dallas B. Phemister, chairman), as well as of the New Haven and New Jersey committees which are being formed. The New York committee works in close cooperation with these committees, but since the initial task of selection devolves on New York, the following organization has been set up:

Members of the General Advisory Council include Dr. George Baehr, Dr. Clarence G. Bandler, Dr. Ernst P. Boas, Dr. Louis Casamajor, Dr. Alfred E. Colin, Dr. Lewis A. Conner, Dr. Haven Emerson, Dr. N. Chandler Foot, Dr. Frank Fremont Smith, Dr. Irving Graef, Dr. Foster Kennedy, Dr. John D. Kernan, Dr. Lawrence S. Kubie, Dr. Emanuel Libman, Dr. Currier McEwen, Dr. Walter W. Palmer, Dr. Henry Aslof Riley, Dr. Peyton Rous, Dr. Charles Hendee Smith, Dr. J. Bentley Squier, Dr. Mills Sturtevant, Dr. Homer F. Swift, Dr. Howard C. Taylor Jr. and Dr. I. Ogden Woodruff.

There is a central office, where each refugee physician is registered for the detailed examination of his credentials (Information about any foreign physician may be obtained by writing to Mr. Charles H. Jordan, Secretary.)

There are advisory boards in each of twenty medical specialties whose function it is to evaluate and examine the personal and scientific qualifications of every refugee. These boards make confidential reports on the qualifications of each individual physician, which are filed in the central office.

Those who are passed by the advisory board are then given material aid by the National Coordinating Committee while studying for state board examinations.

A curriculum committee arranges lectures in various departments of medicine. Emphasis is placed on the broad cultural requirements of American medicine as well as on the factual information required for the licensing examinations. A program for clinical retraining is being prepared to fit certain specialists for general practice.

The committee seeks to secure voluntary assistantships, supernumerary internships and temporary clinic appointments for eligible physicians to assist them in their studies.

After passing their examinations, physicians are resettled in communities where there is a known shortage of medical care. This is done only after consultation with the local authorities and with local representatives of the medical profession.

THE SOLUTION

Community needs must be considered as well as the needs of the physician. Resettlement of qualified physicians in areas most in need of medical service, and therefore best able to absorb the newcomers, is the solution proposed by the Committee for the Resettlement of Foreign Physicians. To this end the committee hopes that a change can be effected in the regulations in a majority of states, which now either bar foreign physicians from practice or make it unduly difficult for them to obtain a license until they become citizens (a period of five years). These local regulations have been largely responsible for the concentration of these physicians on the Atlantic seaboard.

Unquestionably certain foreign physicians cannot and should not be permitted to practice here until they are thoroughly qualified. A few will never be able to meet American requirements. These, obviously, must be retrained outside the medical field.

The committee proposes, through an examining board of qualified physicians, to pass upon the personal or scientific qualifications of the incoming physicians. It will give no support to those who are adjudged to be unfit to practice in this country.

In this connection it is important to quote here from a statement of the Boston Committee on Medical Emigrés, as follows:

After some ten months of experience, this Committee has learned:

1. That a substantial proportion of the medical refugees here and abroad are among the most talented members of the profession, in research and in clinical fields.
2. That existing prejudices against them derive most often from lack of contact and from fear that as aliens they are somehow undesirable. When they are given an opportunity to present themselves in person and have their professional achievements properly scrutinized, preconceived objections to them frequently soften or entirely disappear.
3. It appears likely that, if a thoroughgoing search of this country's unfilled medical needs were made, all of these men who have arrived or may arrive here and whom we consider competent would be absorbed without difficulty and to the distinct advantage of institutions and communities which otherwise go without the services they can provide.

It is the hope of the Committee for the Resettlement of Foreign Physicians that all members of the medical profession will cooperate in its work, to the end that the refugee physicians, who have no desire to compete with American physicians in congested areas, may be given an opportunity to exercise their profession, their skill and their training in areas where their services are most needed.

DAVID L. EDSALL, M.D., Boston.

Honorary Chairman, National Committee for
the Resettlement of Foreign Physicians.

EFFECT OF SUNLIGHT ON BONE AS REPORTED BY HERODOTUS IN 450 B. C.

To the Editor:—In book III of Herodotus's history, in which he describes some of his travels in Egypt and Libya, an account is given of the Persian invasion of Egypt under Cambyses. Near the mouth of the so-called Pelusian Nile, the forces of Cambyses met the Egyptians under King Psammenitus in 525 B. C. Herodotus viewed the battle field about seventy-five years later. His attention was called to the striking difference in thickness and strength of the Persian and Egyptian skulls which were still lying on the surface of the ground. His explanation of this difference is interesting, being so far as I know the earliest recorded definite proof offered of the effect of sunshine in thickening and strengthening bone tissue. A translation of chapter 12 of book III, in as nearly the simple style of the original Ionic Greek as I can make it, runs as follows:

"I saw a great marvel of which I had heard from the natives of the country. The bones of those who fell on either side in this battle lay scattered separately. The bones of the Persians lay in one part of the field and the bones of the Egyptians in another, as the two armies had separately stood. The skulls of the Persians were so fragile that a mere pebble thrown at them would penetrate them. But those of the Egyptians were so strong that you could hardly break them with a stone. The cause of this, so the people said, and I readily agreed, is that from childhood the Egyptians shave their heads, and the bone is thickened by exposure to the sun. For the same reason they do not become bald. Of all races of men bald heads are rarest among the Egyptians. Such then is the reason for their strong skulls. And the reason why the Persians have weak skulls is that they cover their heads all their lives with felt hoods, called tiaras by the Persians. Such are the facts of the case. I noticed the same condition at Papremis in the skulls of the Persians slain by Inaros the Libyan."

E. V. WILCOX, Chevy Chase, Md.

"DIAPHRAGMATIC FLUTTER WITH SYMPTOMS OF ANGINA PECTORIS"

To the Editor:—It may be of interest to your readers to add a note as to the peregrination of the medical curiosity reported in THE JOURNAL by Dr. W. B. Porter March 21, 1936, page 992, and by Drs. Whitehead, Burnett and Lagen April 1, 1939, page 1236, as a case of diaphragmatic flutter with symptoms of angina pectoris.

The patient was brought to the Massachusetts General Hospital Oct. 27, 1937, by police ambulance with the identical clinical picture as described by the previous writers. He lay doubled up on his right side, moaning in pain and in no respiratory distress, with a pulse of 80 and a blood pressure 130/80. He was not perspiring and his color was good. A rapid flutter could be felt and ausculted over the precordium and abdomen, and could be seen as a ripple over the latter. Fluoroscopy showed a normally beating heart and a diaphragm that oscillated with about a 1 cm. excursion at a very rapid rate. An electrocardiogram showed a regular oscillation of the base line of 1 mm. amplitude at a rate close to 300 per minute. His temperature was normal.

He gave his name as Frank Crowley and his age as 65. On entry he presented us with a reprint of Dr. Porter's article, so I presume that is why he listed his occupation as a deep-sea diver, as he did in Richmond, Va. Numerous puncture marks were noticed over both antecubital spaces and his speedy release from all pain on entry after one-fourth grain (0.016 Gm.) of morphine and his subsequent loud demands for more gave some support to the belief that he was addicted to drugs. He proved a very irascible patient and demanded release at daylight on the morning after entry, which was speedily granted after threats to nurses. A psychiatrist thought that he was "queer" but probably not psychotic.

The next day he was picked up from the side of the road by a passing mortorist and was last heard from at the Framingham Hospital.

He was an excellent raconteur and his stories of inspecting the battleship *Maine* and the *Lusitania*, and of crossing the floor of the Red Sea in search of chariots were greatly appreciated.

EDWARD HAMLIN JR., M.D., Boston.

"SYPHILIS IN NORTH CAROLINA"

To the Editor:—In THE JOURNAL April 1, page 1260, appears a short comment entitled "Syphilis in North Carolina." In this article you raise a doubt as to the accuracy of the statement to which you refer and intimate that this statement was made for the purpose of securing federal funds for the control of syphilis in this state.

It is felt in this department that you have placed your own interpretation on these figures and evidently have arrived at an erroneous conclusion. You have mistaken the prevalence of syphilis for the incidence of syphilis. The 48,000 "new cases of syphilis" reported each year are not cases of "new" syphilis in the sense that the disease was acquired within the year in which it was reported. These "new" cases mean simply that they have never been reported before to this department. Many of them are cases of latent and late syphilis, but from a reporting standpoint they are new in that they have never previously been brought to the attention of this department by case report. From your comments you evidently interpreted the 48,000 cases to be those of newly acquired syphilis, acquired within the year in which they were reported. By actual count since Jan. 1, 1936, to Dec. 31, 1938, we have had reported to this department 164,254 cases of syphilis, and you can readily see that this is in excess of 4,000 "new" cases per month.

CARL V. REYNOLDS, M.D., Raleigh, N. C.

Secretary, North Carolina State Board
of Health, and State Health Officer.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

POSSIBLE ACUTE CARBON MONOXIDE POISONING

To the Editor—I was called to attend a patient in coma. The man, aged 24, was apparently healthy with no history of previous serious illness. He states that prior to becoming unconscious he operated the motor of a large truck in a garage with the doors open. In about a half hour he went to the second floor of the same building and looked at the clock, he expected a telephone call and definitely recalled the time. He then attempted to open a window but fell to the floor and recalled nothing until an hour and twenty minutes later, when I saw him. His face appeared flushed with no cyanosis except slight cyanosis of the lobules of the ears. He seemed to recognize me but was unable to speak. There was a definite flaccid paralysis of the left arm and leg. The deep reflexes of both legs and arms were exaggerated. There was no ankle clonus nor was the Babinski reflex present. The tongue deviated slightly to the left, and the left corner of the mouth was slightly raised. The right pupil was somewhat larger than the left, and this condition persists. Both pupils reacted well to light. The heart rate was 84 and there was arrhythmia. On admission to the hospital the temperature was 100 F. Despite the fact that I noted automobile fumes in the room and had all the windows opened, I thought that the patient had suffered a cerebral embolus. The blood pressure was 120 systolic, 82 diastolic. Within four hours the patient apparently completely recovered. He spoke clearly and the foregoing history was elicited. He could use the left arm and leg well. The pulse rose to 120 and the temperature fell to 98 F and then to 97 F in twelve hours. On the third day the pulse fell to 60 and then on the following day to 52. The blood pressure rose to 136/88. The pulse rate one week later was 72. The patient complained of headache shortly after recovering consciousness, but this persisted for only three days. Urinalysis revealed dark green urine, alkaline in reaction, with a specific gravity of 1.032, it was negative for sugar and albumin but the specimen contained 1 plus pus cells. The Kahn test gave negative results; examination of the blood showed red blood cells 4,990,000, hemoglobin 100 per cent, leukocytes 13,100, polymorphonuclear neutrophils 94 per cent, basophils 1 per cent, small lymphocytes, 4 per cent, large lymphocytes 1 per cent. Repeated urinalyses were negative for sugar. I have thought that this patient was overcome by carbon monoxide and have so stated. Are the foregoing symptoms and signs, together with the history, in harmony with such a diagnosis? The patient seems perfectly well but is somewhat anxious about having a recurrence of such an attack if not due to carbon monoxide poisoning. MD, Pa.

ANSWER—On the basis of the data submitted, which contain no real evidence of exposure to carbon monoxide other than the operation of a motor in a large garage with open doors, one cannot make a definite diagnosis of carbon monoxide poisoning. There are no statements as to the effects on other men in the garage at the same time and no data as to possible concentrations of carbon monoxide in the air. Under the circumstances of this accident, the conditions could readily be duplicated and such information obtained. If it could be shown that the air contained from 600 to 800 parts of carbon monoxide per million parts (or from 0.06 to 0.08 per cent), it would probably be proper to assume quite definitely that the illness was due to carbon monoxide. At the present time, far too many conditions are attributed to carbon monoxide without proper reference to the circumstances of exposure, and these should and generally can be proved.

If the symptoms are considered alone and if it is assumed that there is definite evidence that carbon monoxide was in the atmosphere, it is quite fair to believe that this is a case of carbon monoxide asphyxia. Almost any variety of acute neurologic disturbance can occur in carbon monoxide poisoning, and it is frequent that unconsciousness or some serious neurologic symptom is experienced when the patient attempts to move about actively, even though he may move to an atmosphere which is free of carbon monoxide. A man poisoned by carbon monoxide has been brought to the limit of his power to supply his tissues with oxygen from the blood. "He can stand no extra strain of any sort and, even when he regains consciousness, as may be the case when the blood carbon monoxide reaches 50 per cent of saturation, he still has so slight a margin of oxygen tension as to be quite unequal to activity of any sort without suffering instantly from oxygen lack. As Stadie and Martin (1925-1926) remark: 'Despite the presence in the blood of two or three times the amount of oxygen necessary for normal tissue function, profound anoxemia results in CO poisoning. This is due to an alteration of the shape and

position of the oxygen dissociation curve causing a marked lowering of the partial pressure at which oxygen is available for tissue metabolism'" (Drinker, C. K.: Carbon Monoxide Asphyxia, New York, Oxford University Press, 1938. Stadie, W. C., and Martin, K. A.: The Elimination of Carbon Monoxide from the Blood: A Theoretical and Experimental Study, *J. Clin. Investigation* 2:77 [Oct.] 1925). It is the usual rule that those who have had acute experiences due to carbon monoxide such as this recover completely and there is, of course, no reason why the condition should leave any threat behind in terms of possible further trouble.

URTICARIA AND MENSTRUATION

To the Editor—Please give me some information as to the cause, treatment and prognosis of menstrual urticaria. The patient is about 25 years of age and ten months ago she had a cesarean section. Her menstruation is sometimes from four to seven weeks apart, but the history of menstrual urticaria is of several years' duration and the condition lasts from three to five days.

H. C. WIGER, M.D., Rice Lake, Wis.

ANSWER—It is presumed that by "menstrual urticaria" the inquirer has reference to urticarial attacks of a generalized nature (not localized to lesions on the skin in the proximity of the genitalia) occurring particularly in the premenstrual or menstrual periods. A history of urticaria or other allergic manifestations appearing solely or more frequently at that time is a common part of the patient's story. A number of medical articles dealing with that subject have been published. Almost without exception they are all clinical and based on consulting room observation. Intensive studies of a laboratory and experimental nature which might throw light on the association of these two factors, allergy and endocrine, are still lacking. It may be mentioned that there are other associations of a possible relationship between allergy and the endocrines. Some of these are exemplified by the tendency of allergic symptoms to be improved at puberty in the boy and to be aggravated in the same period in the girl, by the likelihood for allergic symptoms to diminish or vanish altogether during pregnancy and by the frequent change in the course of clinical allergy at the menopause.

Until the indicated experimental and laboratory work in the future provides a basis for a more specific and definite correlation of allergic symptoms and the menstrual cycle, this relationship will be regarded as a general one. According to the latter conception allergic symptoms are more apt to occur around the menstrual period just as they are more apt to occur following other emotional upsets, infections, exertion and thermal, mechanical and chemical stimuli. They are usually the precipitating factors rather than the specific causes in a patient who has an ever present allergy but is capable of being in allergic balance most of the time. In the case cited and in similar types there are three main methods by which one may achieve results: One is, of course, by the use of rest, sedation and such other measures as may counteract the excitability of the nervous system. Finally, results sometimes may be achieved by endocrine therapy. The prognosis is fair.

SILVER PREPARATIONS FOR SINUSITIS

To the Editor—Please discuss the treatment of sinusitis by the insertion of colloidal silver tampons. MD, Massachusetts

ANSWER—The use of colloidal silver tampons in the treatment of chronic sinusitis is practiced extensively by otorhinolaryngologists in this country. In a recent questionnaire it was shown that approximately 90 per cent of specialists used some silver salt in treating diseases of the ear, nose and throat. Although practically every silver preparation has been used, the favorite one is mild protein silver (argyrol) usually in 10 per cent strength.

Colloidal silver preparations are said to be bactericidal, sedative to inflamed mucous membranes and stimulating to reparative powers. These are debatable points. It is true, however, that the colloidal silver preparations are mildly astringent and it is partly due to this property that they give symptomatic relief. Moreover, because of their colloidal state and their astringent property they do incite a profuse watery secretion from the mucous membranes which depletes the nasal mucosa, thus supposedly helping rid the nose and sinuses of bacteria and pus.

The more ardent proponents of the silver tampon treatment have formulated a routine of tampon insertion, designating types of cotton, applicators and position of the tampon. The latter, the "sphenoid" and "infundibulum" direction, is said to bring

the medication into contact with most of the sinus ostiums and is considered by some to be absolutely indispensable to the full success of the procedure. The tampons are left in place from thirty minutes to an hour and after removal the nose is flushed with some cool irrigating fluid.

Despite the popularity of this form of treatment there are many capable rhinologists who feel that it has no peculiar advantages over many other conservative methods of treating chronic sinusitis.

The bacteriostatic and bactericidal power of mild protein silver as investigated by Hilding, Cannon and Walsh, is so slight as to be of little clinical importance. The astringent effects can be achieved by many other drugs without too elaborate a technic of medication. Though mild protein silver has not been shown to be harmful to ciliary activity, the possibility of argyria, local or general, even though infrequent, must be kept in mind when one is using silver salts extensively.

POSSIBLE HEAT STROKE WITH APHASIA

To the Editor.—The following is the summary of a case of mixed aphasia which suddenly occurred coincidentally with what was diagnosed as "heat stroke." A white man aged 50, large, well developed and muscular, was working digging a basement for a school house. The day was hot, there was no air circulating in the pit and the sun was beaming overhead. At 1 p. m. the patient suddenly got faint and collapsed unconscious. His fellow workmen first thought he had fainted, but when he failed to revive he was taken to the hospital, where he had a subnormal temperature and excessive sweating, and where he remained unconscious for four days. On regaining consciousness he was found to have a motor aphasia, apraxia, paraphasia and partial auditory aphasia but no alexia. Right hemiparesis and right hemiparalysis were present. The tendon jerks were hyperactive on the right side. The spinal fluid was normal, the gold curve 00000000, the Wassermann reaction of both the spinal fluid and the blood was negative. The pressure was 150 mm. initially and also after 10 cc. had been removed. The cranial nerves were entirely normal, there being no evidence of arteriosclerosis of the retinal vessels. The blood pressure was 140 systolic, 90 diastolic. The peripheral arteries were soft. The patient shows no clinical evidence of cardiac, renal or other organic disease. The patient is suing for compensation insurance, none of which has ever been paid since the onset of his illness. Now the question arises Can heat stroke cause aphasic symptoms such as the aforementioned and can you cite such cases on record? I might add that the signs and symptoms have remained unchanged during the past six months since the onset of the illness.

W. L. SHARP, M.D., Anderson, Ind.

ANSWER.—It is improbable that the patient is suffering from heat stroke per se unless it can be shown that he was entirely well without cardiac, renal or any other organic disease prior to the onset of his coma and that following the exposure he developed a deep coma with a temperature of from 104 to 108 F. as well as an increased cell count in the spinal fluid. If this can be done it will be possible to establish a causal relationship between the heat of the sun and the present symptoms. If he had these symptoms (heat stroke), this is one of the rare cases in which recovery occurs. Most all patients with heat stroke or apoplexy die because of the high temperatures and dehydration despite all therapy. It seems peculiar that the man showed only those signs of a large softening or hemorrhage (embolus, hemorrhage or multiple thrombi) on the left side of the brain. In heat stroke there is a widespread ganglion cell damage which produces not only hemiplegia, paraplegia, ataxia and aphasia but also convulsions and psychosis. The article by Shattuck and Hilferty (*Am. J. Trop. Med.* 12:223 [May] 1932) is recommended for perusal.

NARCOTIC ADDICTION AND HEREDITY

To the Editor.—I should like information concerning the effect of the use of morphine by the father, for a number of years previous to and at the time of conception, on the offspring. I also wish the same information where the father discontinued the use of morphine a few months prior to conception. I would also appreciate general information concerning morphinism and reproduction, especially relating to its effect on the offspring.

WALTER G. KLUGH, M.D., Hot Springs National Park, Ark.

ANSWER.—The problems and underlying reasons for the excessive use of narcotics and alcohol are the same. It is an escape mechanism from life's conflicts. Chronic morphinism has no true demonstrable pathologic picture. The nature of the disorder is mostly psychologic and not physiologic or pathologic.

Drug addicts can be divided into three groups: 1. The accidental addict, about 10 per cent, composed of normal individuals who develop the habit after the narcotic had been administered for the relief of pain for a period long enough to develop true withdrawal symptoms and who, when the narcotic is discontinued, do not resort to it again, after a

successful denarcotization treatment. 2. The recidivists, about 30 per cent, composed of potential narcotic addicts with underlying nervous instability who, after once experiencing narcotic relief and sensation, are unwilling or think they are unable to stand the mental or physical distress which normal persons accept without demanding narcotic relief. 3. The psychopathic personalities, about 60 per cent, recruited from the large class of inadequates with serious underlying defects of personality who find the drug a panacea for their lack of ability to adjust themselves to life's conflicts; the latter group includes the ne'er-do-well type made up of life's misfits who, as a rule, in spite of the exaggerated and sensational news and police reports, are not vicious or dangerous criminals. Addicts make poor criminals. They have no will power, their judgment is defective, they cannot be trusted and they commit, as a rule, only petty crimes and are ostracized and looked down on by the more capable and dangerous criminals.

There is no evidence that the excessive use of morphine affects the germ plasma of ova or spermatozoa or that the offspring are injured by morphinism in the father. However, where the nursing mother is an addict, cases have been reported that when feeding at the breast was discontinued the baby exhibited withdrawal symptoms which were promptly relieved by an opiate.

The danger lies in the descendant's inheriting the unstable nervous system and personality defect of the parent rather than the effect of chronic morphinism.

ESTROGENIC SUBSTANCE FOR ACNE AND FACIAL HYPERTRICHOSIS

To the Editor.—Somewhere I have read that acne vulgaris and facial hypertrichosis have been successfully treated with folliculin ointment. Please explain how it works and where one may procure the ointment?

M.D., Ohio.

ANSWER.—The theory of the use of estrogenic substance for the treatment of acne and hypertrichosis is that both these disorders are due to lack of the estrogenic substance. This is no doubt true for some cases of hypertrichosis and may be part of the basis of some cases of acne vulgaris. Most dermatologists are willing to state that some hormone disturbance is behind dyscrasia of the sebaceous glands which results in acne, but what this disturbance is they are not able to say. Theodore Rosenthal and Raphael Kurzrok (Excretion of Estrin in Acne, *Proc. Soc. Exper. Biol. & Med.* 30:1150 [May] 1933) found the estrogenic principle regularly present in the urine of normal women but absent from the urine of twenty-seven of the thirty-three women with acne vulgaris whom they tested.

Practical application of this theory to the treatment of acne vulgaris has not been conspicuously successful.

References:

- Rosenthal, Theodore: Acne and Its Relation to Endocrines, *Journal. Lancet* 56:496 (Sept.) 1936.
Van Studdiford, M. T.: The Effect of Hormones of the Sex Glands on Acne, *Arch. Dermat. & Syph.* 31:333 (March) 1935.
Lawrence, C. H.: The Anterior Pituitary-like Hormone: A Clinical Study of Its Effects in Acne Vulgaris, *THE JOURNAL*, March 21 1936, p. 983.
Michael, J. C.: Observations on the Treatment of Acne Vulgaris, *THE JOURNAL*, Aug. 3, 1935, p. 327.
McCarthy, Lee, and Hunter, O. B.: Failure of Therapy with Glandular Preparations in Acne Vulgaris, *Arch. Dermat. & Syph.* 35:211 (Feb.) 1937.
Templeton, H. J., and Truman, S. R.: Endocrine Therapy in Acne Vulgaris, *California & West. Med.* 48:337 (May) 1938.

In his discussion on the paper of Van Studdiford, C. Guy Lane cited a case of acne occurring at menstrual periods which had resisted x-rays but cleared up when amniotin was given for about seven months and remained clear without further medication. Earlier attempts to stop treatment had resulted in recurrence.

The results of the treatment of hypertrichosis in women is also unpredictable. In most cases no benefit is seen. Once in a while success is achieved for a while, but seldom is the result permanent. The chance of obtaining relief from the excessive growth of hair is much better when other symptoms of ovarian disturbance accompany the hypertrichosis.

While it seems that the use of estrogenic substance is justified in women with some signs of ovarian disturbance accompanied by hypertrichosis or acne vulgaris, especially the form which recurs at the menstrual period and clears up between the periods, it is certainly unwise to use such preparations indiscriminately. In view of the effect in young male rats, its use in boys, with acne should be avoided. It is a drug with great and not fully explored potentialities. Its administration in ointment form has the disadvantage of indefinite dosage.

HYPERKERATOSES OF FEET

To the Editor—A woman aged 24, whose physical examination is otherwise negative, has had thick callosities of the soles, heels and toes of both feet for six years. A surgeon and a dermatologist in consultation agree that this is apparently a simple callosity. Various ointments, including cod liver oil and allantoin, as well as paring down, have been followed by prompt recurrence even when the patient was kept in bed for a month. Roentgen therapy (twelve treatments, details lacking) in a large New York hospital to the extent of producing a slough was otherwise ineffectual. Ultraviolet has been tried. The patient has been saturated with vitamins A, B, C, D and G. The roentgen necrosis is now healed. Please help.

JOSEPH M. GROSS, M.D., Brooklyn

ANSWER.—Simple calluses are discrete overgrowths of the superficial part of the skin due to pressure or friction rub. Removal of the cause prevents recurrence of the callus. In view of the recurrence with the patient in bed, this would rule out the presence of a simple callus.

Hyperkeratosis, which corresponds to the description in this case, is an overgrowth of the outer layer of the skin which occurs on the plantar surface of the foot.

Hyperkeratosis is frequently a late stage of dermatomycosis. Treatment of the hyperkeratosis in such an instance would be the use of heliotherapy or Whitfield's ointment; 5 per cent salicylic acid in hydrous wool fat may be rubbed vigorously into the skin. Walking barefooted on dry sand is helpful if this is practical.

In addition, there is a hyperkeratotic condition of the skin which occurs in certain persons without known cause. This type may be congenital. Inquiry should be made to ascertain whether arsenic has been used as medication, since this is sometimes a cause of hyperkeratosis. Roentgen treatment has been used in some cases with benefit, but most of these patients are best treated by thoroughly washing the foot with tincture of green soap, which softens the skin. This is followed by an application of 5 per cent salicylic acid in hydrous wool fat, which is rubbed vigorously into the skin several times a day.

HEMORRHAGE AND LEUKEMIA

To the Editor—In a case of lymphatic leukemia, with the patient in fair condition and of plethoric type, what would be the effect of removal of a large quantity of blood (blood letting)? How long is the time of blood restoration? Which constituents of the blood are first restored? Are the erythrocytes or leukocytes first regenerated? Has this been given any scientific study as to extent or location of faulty regenerative function of the hematopoietic cells?

A. G. LEE, M.D., Texarkana, Ark.

ANSWER.—Although there are no data available on the effect of venesection in leukemia, large spontaneous hemorrhages occur which produce the same effect. Following such an occurrence, red cell and hemoglobin regeneration is slow—often there is no regeneration, especially in the acute forms of the disease. This poor response is probably due to the fact that the red cell forming tissue is already overtaxed. In several observed cases extensive hemorrhage did not affect the white cells appreciably.

No literature is available on the use of venesection as a test in leukemia. However, the cause of the anemia in leukemia is not settled, being variously thought to be due to malfunction of the marrow or to increased peripheral destruction.

POISONING FROM SELENIUM

To the Editor.—Kindly give me a brief description of so called poisoning by selenium fumes and the treatment.

M.D., New York

ANSWER.—Acute or chronic poisoning by selenium may be produced by inhalation of volatile selenium compounds or seleniferous dusts. In animals inhalation of moderately high concentrations of hydrogen selenide (H_2Se) produced fatty metamorphosis of the liver, accompanied later by hypertrophy of the spleen. At lower concentrations of hydrogen selenide, animals show less marked liver and spleen damage. Numerous studies have shown the toxic properties of selenium on ingestion or injection of its compounds. In general the site of greatest injury from absorption of selenium compounds is the liver, spleen and kidneys.

In man the symptoms following prolonged absorption of selenium may include pallor, disturbances, garlic odor of the breath and of the nose and throat (rose cold), coating of the tongue, and metallic taste in the mouth. Selenium in the urine is conclusive evidence that absorption of selenium has occurred. Analysis of a morning specimen of urine for selenium is suggested as a diagnostic procedure.

To prevent further absorption of selenium is the first step in the treatment of chronic selenium poisoning. The treatment is symptomatic; some authors suggest the use of a high carbohydrate diet, with increased water intake, as excretion is predominantly renal.

Selected general references:

Hamilton, Alice: Industrial Poisons in the United States, New York, Macmillan Company, 1925.
Dudley, H. C.: Selenium as a Potential Industrial Hazard, *Pub Health Rep* 53:281 (Feb. 25) 1938, reprint 1910

TUBERCULOSIS AND CAISSON DISEASE

To the Editor—A man aged 38 suffered an attack of caisson disease in March 1936, from which he made an almost complete recovery. Examination of his lungs at that time did not reveal any pathologic condition and no x-ray examination was made. In March 1937 a diagnosis of active pulmonary tuberculosis (positive sputum and roentgenograms) was made. He began to cough about a month before the roentgenograms were taken. Is there any possible connection between the tuberculosis and the caisson disease? Is there any literature on this subject?

M.D., New Jersey

ANSWER.—There is no logical explanation of a relationship between the attack of caisson disease which the patient suffered in March 1936 and the presence of active pulmonary tuberculosis in March 1937. As pulmonary tuberculosis frequently is not detected by physical examination and since x-ray films were not made, it is possible that pulmonary disease was present in a presymptomatic stage at the time he had caisson disease. Often chronic pulmonary tuberculosis can be located by x-ray films several years before significant abnormal physical signs or symptoms make their appearance. Therefore it is possible that x-ray examination in March 1936 would have revealed evidence of the disease.

On the other hand, it is possible that tuberculosis was not present in March 1936 and that the patient became infected subsequently to that date, since many persons now contract their first infections in adult life. No mention is made of a tuberculin test having been administered at the time of or subsequent to the attack of caisson disease. If this was done, and the patient was a nonreactor at that time, there is excellent evidence that the tuberculosis is of recent origin. Although the time is short for the development of chronic pulmonary tuberculosis from a recent infection there is occasionally such an occurrence. However, with the evidence presented there would not appear to be any association between caisson disease and tuberculosis.

RABIES PROPHYLAXIS

To the Editor—A recent outbreak of rabies resulted in scores of people presenting themselves for preventive treatment. Their contacts varied from ordinary petting of rabid animals to actual bites. One department in the area gave treatment to every one who had had any contact at all, whereas the other department required an actual bite of more than trivial extent before Pasteur treatment was started. Must a skin wound from the bite of a rabid animal be of subcutaneous depth or more before Pasteur treatment is indicated? Do small, superficial breaks in the skin indicate treatment if the patient has had contact with a rabid animal?

JOHN M. COLLINS, M.D., Seattle

ANSWER.—In the treatment of a person who may have been bitten by a rabid animal, the guiding principle is always safety first. Take no chances! The answer to the first question is No. Any wound made by the bite of a rabid animal, no matter how insignificant, may admit the infection. The answer to the second question is Yes in case it is possible that the break in the skin was made by the bite of a rabid animal.

COPPER IN DRINKING WATER

To the Editor.—Will you please advise me as to whether or not any toxic effects could result from using drinking water which contains 0.63 part of copper per million parts of water?

ARTHUR H. LONDON JR., M.D., Durham, N. C.

ANSWER.—The United States Treasury Department standard for water supplies to be furnished for drinking and culinary purposes by interstate carriers requires that the copper content of the water shall not exceed 0.2 part per million. In recent years there has been some criticism of this standard by biologists and chemists and physiologists, claiming that it is too low and that harmful effects may not result if the copper content is as high as 1 part per million. Experience with the physiologic effects of copper in the light of its more liberal use in water service connections and for control of algae in the public water supplies seems to indicate that the official standard is quite conservative.

GLASSES FOR PROTECTION AGAINST ULTRAVIOLET RAYS
FROM A QUARTZ BURNER

To the Editor:—Do ordinary glass or polaroid glasses give adequate protection against ultraviolet rays directed into the face with the eyes open from a Hanovia mercury vapor quartz burner? What is the lens in the goggle furnished by the manufacturer? The representative is unable to tell me. M.D., New York.

ANSWER.—Ordinary glass and polaroid glasses do give adequate protection against ultraviolet rays directed into the face with the eyes open with any quartz burner emitting ultraviolet rays. The polaroid glasses, however, are rather expensive and there is no point in using them for protection against ultraviolet rays, as ordinary window glass serves the same purpose.

Glass in goggles ordinarily used when taking ultraviolet radiation treatments are of various styles and usually are colored merely to soften the glare of the light. There are glass preparations on the market for protection against the effects of screening out infra-red radiation as well as ultraviolet radiation.

CHILDBIRTH AND OBESITY

To the Editor:—What would be the proper procedure for delivery in the following case? A negro woman 29 years old and weighing 325 pounds (147 Kg.) had one child after a difficult labor sixteen years ago and another stillborn child nine years ago. At both previous pregnancies her weight was under 200 pounds. She is at term. The question has arisen whether this woman should be delivered by cesarean section without previous test of labor or should be allowed to go into labor and the case handled from then on according to indication. M.D., Indiana.

ANSWER.—A cesarean section in a patient weighing 325 pounds is a formidable procedure. It necessarily carries with it a considerable risk for the mother. The query does not state that the previous stillborn children were the result of difficult labors. The labors may not have contributed to the fetal deaths. Unless some unusual complication arises, the safest procedure is to allow the patient to go into labor and deliver her through the birth canal. The rapid increase in her weight need not necessarily contribute to a more difficult natural delivery.

ORAL IRON MEDICATION AND CONSTIPATION

To the Editor:—What method or methods may be used to prevent the constipation so frequently caused by oral iron medication?

E. N. MURRAY, M.D., Camden, N. J.

ANSWER.—Oral iron medication usually causes constipation in persons who already have such a tendency. Sometimes the constipating effect seems to be worse when small doses are given. Ferrous sulfate and iron and ammonium citrates given on an empty stomach between meals in 0.2 Gm. (3 grain) and 2 Gm. (30 grain) doses three times a day respectively are frequently less costly than other preparations. If this fails, the usual treatments for constipation must be tried.

SUPERNUMERARY FINGERS AND TOES

To the Editor:—Please state what you consider the best time in life to operate on supernumerary fingers and toes. M.D., Ontario.

ANSWER.—In general it would be wise to remove supernumerary fingers and toes early in life, in fact as soon as the parts involved are well enough developed to make an accurate surgical removal possible after a careful study of the roentgenograms. Sometimes these extra digits are attached by separate joints, sometimes one joint suffices for both, and therefore the amputation must avoid impairment of the function of the adjacent finger or toe. In general this type of plastic surgery should be done about the end of the first year.

VAGINAL ABSORPTION

To the Editor:—On page 173 of the January 14 issue of THE JOURNAL the question "Is there any absorption from the vaginal mucosa?" is answered "There is no absorption from the intact vaginal mucosa. There can be absorption from a damaged mucosa. It is not probable that absorption in such a manner occurs often enough to be of practical importance." Absorption of the estrogens from the vaginal mucosa is well known. Serious poisoning and fatalities have been all too frequently reported after the use of mercury bichloride for vaginal douches. In addition there is the study by Macht (*J. Pharmacol. & Exper. Therap.* 10:509 [Jan.] 1918) in which it is stated in the conclusions: "It has been shown that a large number of drugs and poisons . . . alkaloids, inorganic salts, esters and antiseptics can be and are easily absorbed through the vaginal wall."

WALTER MODELL, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 20-22. Sec., Dr. J. N. Baker, 517 Dexter Ave., Montgomery.

ARKANSAS: Medical (Regular). Little Rock, June 8-9. Sec., State Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, 317 State Line, Texarkana. Medical (Eclectic). Little Rock, June 8-9. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock. Basic Science. Little Rock, May 22. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock.

CALIFORNIA: Written examinations. San Francisco, July 10-13, Los Angeles, Aug. 7-10, and Sacramento, Oct. 16-19. Oral examinations (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, August 7, and San Francisco, Nov. 15. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: Basic Science. New Haven, June 10. Prerequisite to license examination. Address State Board of Healing Arts, 1895 Yale Station, New Haven. Medical (Regular). Hartford, July 11-12. Endorsement. Hartford, July 23. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. Medical (Homopathic). Derby, July 11-12. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 11-13. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: Basic Science. Washington, June 26-27. Medical. Washington, July 10-11. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, June 19-20. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June 7-8. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

ILLINOIS: Chicago, June 20-22 and Oct. 17-19. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

INDIANA: Indianapolis, June 20-22. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: Iowa City, June 6-8. Dir., Division of Licensure and Registration, Mr. H. W. Greife, State Department of Health, Capitol Bldg., Des Moines.

KANSAS: Kansas City, June 13-14. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, June 7-9. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

MAINE: Augusta, July 11-12. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: Medical (Regular). Baltimore, June 20-23. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. Medical (Homopathic). Baltimore, June 20-21. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 11-13. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Ann Arbor and Detroit, June 14-16. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 100 W. Allegan St., Lansing.

MISSISSIPPI: Jackson, June 21-22. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: St. Louis, June 1-3. Sec., State Board of Health, Dr. Harry F. Parker, State Capitol Bldg., Jefferson City.

NEBRASKA: Omaha, June 8-9. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW HAMPSHIRE: Concord, Sept. 14-15. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 20-21. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York, and Syracuse, June 26-29. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, State Education Department, Albany.

NORTH CAROLINA: Raleigh, June 19. Sec., Dr. William D. James, The Hamlet Hospital, Hamlet.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, June 6-9. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Basic Science. Oklahoma City, May 15. Sec. of State, Hon. C. C. Childress, State Capitol, Oklahoma City. Medical. Oklahoma City, June 14. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: Medical. Portland, June 20-22. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland. Basic Science. Corvallis, July 8, and Portland, Oct. 28. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia and Pittsburgh, July. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, 400 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, June 27. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 18-19. Director, Medical Licensure, Dr. G. J. Van Heuvelen, State Board of Health, Pierre.

TENNESSEE: Memphis, June 15-16. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

TEXAS: Austin, June 21-23. Sec., Dr. T. J. Crowe, 918 Mercantile Bldg., Dallas.

UTAH: Salt Lake City, June 26-28. Dir., Department of Registration, Mr. G. V. Billings, 326 State Capitol Bldg., Salt Lake City.

VERMONT: Burlington, June 14-16. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 21-23. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WEST VIRGINIA: Bluefield, July 5. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: *Basic Science*. Milwaukee, June 3. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical*. Milwaukee, June 27-30. Sec., Dr. Henry J. Gramling, 2203 S. Layton, Blvd., Milwaukee.

WYOMING: Cheyenne, May 31. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in *THE JOURNAL*, May 6, page 1857.

Colorado January Report

Dr. Harvey W. Snyder, secretary, Colorado State Board of Medical Examiners, reports the written examination held at Denver, Jan. 4-6, 1939. The examination covered eight subjects and included 161 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. Four physicians were licensed by endorsement on January 3. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School.....	(1938)	89	
Osteopathy *		82, 86	
School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Rush Medical College.....	(1937)	N. B. M. Ex.	
State University of Iowa College of Medicine.....	(1926)	Iowa	
St. Louis University School of Medicine.....	(1936)	Illinois	
Baylor University College of Medicine.....	(1926)	Texas	

* Licensed to practice medicine and surgery.

Book Notices

The Treatment of Fractures. By Charles Locke Scudder, A.B., Ph.D., M.D., Consulting Surgeon to the Massachusetts General Hospital, Boston. Eleventh edition. Cloth. Price, \$12. Pp. 1,208, with 1,717 illustrations. Philadelphia & London: W. B. Saunders Company, 1938.

The treatment of fractures forms a more important part of surgical practice today than ever before because of much reckless automobile driving and the ever increasing mechanization of industry. In the twelve years since the previous edition of this book there have been many advances in the diagnosis and treatment of fractures, making it necessary for the author to rewrite his material completely. He has deleted all obsolete methods of diagnosis and treatment and added hundreds of new illustrations. Dr. Scudder personally approves the opinions expressed by the twenty other contributors to the volume, men actually engaged in doing the procedures about which they have written. He recognizes the importance of adequate first aid treatment and proper transport, factors which the general practitioner must master. There are forty-seven chapters; however, the size of the book remains convenient. It closes with a chapter on the medicolegal aspects of fractures.

The Essentials of Modern Surgery. Edited by R. M. Handfield-Jones, M.C., M.S., F.R.C.S., Surgeon to Out-Patients, St. Mary's Hospital, London, and A. E. Porritt, M.A., M.Ch., F.R.C.S., Surgeon to His Majesty's Household. Cloth. Price, \$9. Pp. 1,126, with 501 illustrations. Baltimore: William Wood & Company, 1938.

This book succeeds in its attempt to present the essentials of modern surgery in concise form for both students and practitioners. While it represents the work of fifteen authors, who are responsible for individual chapters, the chapters contributed by the senior author are especially fine. The numerous and instructive illustrations are unsurpassed in any similar volume. In arrangement the book resembles many current volumes in the same field, beginning with an entirely adequate treatment of the pathology of inflammation, infections and the principles of surgical technic and then passing on to regional surgery. The text is lucid, interesting and in general authoritative. However, an American reviewer is surprised to find in the chapter on anesthesia considerable discussion of chloroform but no mention of ethylene or of some of the more recent inhalation anesthetic agents. A more adequate discussion of diseases of the biliary tract and of cholecystography seems desirable. No mention is made of the use of the gastroscope and its place in the diagnosis of gastric lesions. More serious is the omission of any discussion of the problems of water balance, dehydration, and demineralization in preoperative and postoperative treatment and the significance of these factors in acute intestinal obstruc-

tion, acute dilatation of the stomach and high intestinal fistulas. These are minor criticisms, however, and both the authors and the publisher are to be highly commended for the production of this book.

Clinical and Experimental Investigations in Agranulocytosis with Special Reference to the Etiology. By Preben Plum. Denne Afhandling er af det lægevidenskabelige Fakultet antaget til offentlig at forsvares for den medicinske Doktorgrad, København. Paper. Pp. 410, with 113 illustrations. London: H. K. Lewis & Co., Ltd.; Copenhagen: Nyt Nordisk Forlag, Arnold Busck, 1937.

Most of this volume is devoted to the etiology of granulocytopenia. It is the most comprehensive and accurate compilation of data concerning that disease which has yet appeared. There are twelve chapters, a section of photomicrographs and records of 114 cases of agranulocytosis and other leukopenic diseases, all of which were observed in Denmark by the author or his colleagues. These chapters are followed by a list of drugs incriminated in the production of the disease, a summary, a summary in Danish, and finally a bibliography of 422 references incorporating the literature of the world. As stated in the introduction, the author compiled this work under a fellowship from a Danish fund for medical research and was aided by financial grants from other scientific agencies of Denmark. Therefore it can be considered to be accurate and scientific.

The first chapter considers the history of the disease, and early sporadic cases are cited. Plum concludes that the disease probably did not exist before the report of Schultz in 1922. There is then a thorough discussion of the terminology, geographic distribution, seasonal incidence, sex and age incidence and occupational frequency. Just as in the United States, the disease in Denmark has occurred more frequently in physicians, nurses and others closely associated with the medical profession. In about fifty pages there is an excellent summing up of the clinical symptoms, hematologic signs, pathologic changes and results of laboratory studies. Data from the world literature are presented, and the reports of the ninety cases studied in Denmark are included. Nearly eighty pages is then devoted to the etiology of agranulocytosis, and in this section is found the most interesting material. The author considers the various etiologic concepts that have been presented, including the role of infections, the various predisposing factors, the influence of the menstrual cycle, the role of allergy, the effects of such agents as arsenamine, benzene, arsenic, bismuth and gold preparations and, finally, the role of aminopyrine. There is then presented an accurate and chronologic record of the development of the theory of causation by drugs, beginning with the report of Kracke in the United States, who is given priority for the development of the concept. The author summarizes the cases reported of granulocytopenia occurring after the administration of aminopyrine, including experimental work with both human beings and animals, and includes his own extensive experiments. There is a brief discussion of the role of other drugs, including the barbituric acid preparations, novaldin, antipyrine, acetanilid, acetophenetidin, dinitrophenol, cinchophen, quinine, neostibosan and sulfanilamide. He states that since the probable etiologic significance of aminopyrine was recognized in Denmark the consumption of the drug has markedly decreased and that there has been a remarkable parallel between the incidence of the disease and the consumption of the drug to the extent that in 1936 the disease had practically disappeared. He concludes that it may be safely assumed that, as far as Denmark is concerned, aminopyrine is in all probability the main etiologic factor in agranulocytosis. He then discusses the pathogenesis, emphasizing the belief that the clinical symptoms are preceded by the hematologic changes and that the infectious processes result from loss of cellular resistance. The final four chapters deal with the diagnosis, differential diagnosis, course, prognosis and treatment. He discusses the merits of treatment with nucleic acid products including pentnucleotide, liver extract, transfusions, x-rays and other measures. A note of pessimism is sounded, for "according to our present knowledge of the etiology of agranulocytosis the therapeutic methods generally employed do not appear particularly expedient" and "the rational thing is to direct our therapeutic efforts against the provoking agent." He stresses the value of

prophylaxis and emphasizes that the most valuable measure in the control of the disease is to reduce the consumption of aminopyrine.

The twenty-six colored illustrations are excellent photomicrographic reproductions of the various mature and immature blood cells, and the black and white ones are mainly of the bone marrow in agranulocytosis. This work is available in both English and Danish. It has been executed with meticulous care and with a high degree of accuracy by one who obviously is a careful worker. It represents an authoritative source of material for all those interested in agranulocytosis and other leukopenic diseases.

Proceedings of the Fourth Conference on Psychiatric Education Undergraduate Instruction, Baltimore, Maryland, April 8-10, 1936. Paper. Pp. 345. New York City: The National Committee for Mental Hygiene, Inc., Division of Psychiatric Education, 1938.

In April 1936 the Fourth Conference on Psychiatric Education was held in Baltimore with Adolph Meyer in the chair. The present volume is a report of the proceedings of this conference and is an extremely comprehensive survey of the subject of psychiatric education. Many reports are included which discuss how much of the medical school schedule is devoted in various universities at the present time to the presenting of psychiatric material to the student. Papers were read in which the ideal curriculum in psychiatry for medical students was considered, and such features as the need of premedical psychology courses and the relationship of other parts of the medical curriculum to psychiatry were discussed in some detail. Considerable attention was devoted to the matter of how psychiatry should be taught, how the class work should be divided, the purpose of ward walks and the need for special training in the teaching of psychiatry. About a third of these proceedings is allotted to an appendix, which deals with the psychiatric course presented at the Johns Hopkins Hospital. There are classifications of mental disease along the lines of those in use at the Johns Hopkins University School of Medicine, and forms for history taking and recording are also shown. Also included in the appendix are several papers, chiefly by Dr. Meyer, which were not read at this conference but which treat of various aspects of psychiatry.

Traité de chirurgie orthopédique. Publié sous la direction de L. Ombredanne et P. Mathieu. Secrétaires de la rédaction: M. Lance, G. Huc et P. Padovani. Tome I. Physiologie, pathologie et thérapeutique. Cloth. Price, 300 francs. Pp. 902, with 433 illustrations. Tome II. Physiologie, pathologie et thérapeutique générales (fin). Rachis; membre supérieur. Half-cloth. Pp. 903-1921, with illustrations. Tome III. Deuxième partie: Rachis; membre supérieur (suite et fin). Cloth. Price, 300 francs. Pp. 1919-2875, with illustrations. Tome IV. Troisième partie: Bassin; membre inférieur. Half-cloth. Price, 300 francs. Pp. 2873-3778, with illustrations. Tome V. Quatrième partie: Rachis; membre inférieur (suite et fin). Half-cloth. Price, 300 francs. Pp. 3777-4482, with illustrations. Paris: Masson & Cie, 1937.

This set of five volumes is the finest material on orthopedic surgery that has come from France. It reflects the knowledge of French orthopedic surgeons and general surgeons interested in bone and joint and related lesions. The contributors were chosen with great care, and they have done themselves, both individually and collectively, great honor. Some of the most notable are Ombredanne, Mathieu, Lance, Huc, Padovani, Calvé, Delahaye, Ducroquet, Fontaine, Ferdet, Inglerans, Lamy, Lasserre, LeDoux-Lebard, LeFort, Leriche, Leveuf, Mouchet, Nové-Josserand, Policard, Ponzet, Rendu, Rocher, Roederer, Sorrel, Sorrel-Dejerine and Tavernier. Volume I treats congenital malformation of the extremities, the skeletal system, lesions of bones, diseases of joint and surgical procedures on joints, diseases of muscles, tendons and aponeuroses, and lesions of the skin. Volume II deals with diseases of the nervous system, including spastic paralysis, infantile paralysis and wounds of nerves, as well as lesions of the blood vessels of interest to the orthopedic surgeon, diseases of the blood, diagnostic roentgenography in orthopedic surgery, apparatus, including splints and braces, plaster of paris and celluloid, treatment in general of wounds, kinesitherapy, physical therapy and climatotherapy. The second part of this volume discusses the spine and all its lesions. Volume III contains a discussion of tumors of the vertebra, unusual diseases, the shoulder girdle and all its lesions, the thorax, the scapula, the shoulder, the arm, the elbow, the forearm, the wrist and the hand. Volume

IV deals with the pelvis, the hip, the thigh and the knee from the standpoint of congenital defects and infectious diseases. Volume V deals with the leg, the ankle joint and the foot, amputations, apparatus of all types, paralysis of the upper extremities, operative technic and apparatus for paralysis of the upper extremities and for the lower extremities, and the procedures for equalization of the length of the lower extremities. The text, composition and illustrations are excellent. The collaborators are unfamiliar with or unwilling to accept the work of surgeons in other countries. There is an occasional reference to Italian and German literature but few to that of the English speaking countries. The work is encyclopedic; it cannot be recommended to the individual English reading orthopedic surgeon but is a valuable reference work.

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern. Röntgendiagnostik der Gelenke mittels Doppelkontrastmethode. Von Dr. J. Oberholzer, Chefarzt am Kantonalen Krankenhaus Wallenstadt. Mit Vorwort von Dr. med. E. Bircher, A. Spitaldirektor Anrau. Fortschritte auf dem Gebiete der Röntgenstrahlen, Ergänzungsband XVI. Herausgeber: Prof. Grashof. Paper. Price, 23 marks. Pp. 128, with 134 illustrations. Leipzig: Georg Thieme, 1938.

The author discusses diagnostic roentgenography of joints by means of a double contrast method. The technic of the injection of various joints by the contrast method and the x-ray technic are effectively demonstrated. The discussions and illustrations, especially of the knee joint, are excellent and offer a fine method of precise diagnosis of interesting and often difficult problems.

Analysis of Parergasia. By Gladys C. Terry, Research Associate, Neurological Institute of New York, Columbia University, New York, and Thomas A. C. Rennie, M.D., Associate in Psychiatry, Phipps Psychiatric Clinic, Johns Hopkins University, Baltimore. With an introduction by Adolf Meyer, Henry Phipps Professor of Psychiatry, Johns Hopkins University, Baltimore. Nervous and Mental Disease Monograph Series No. 64. Boards. Price, \$4. Pp. 202. New York: Nervous and Mental Disease Publishing Company, 1938.

Seventy-seven cases of parergasia or schizophrenia from the basis for the present volume. A mass of data is arranged according to the life experience chart of Adolph Meyer. A tremendous amount of material is presented and yet a purely descriptive use is made of it. The parergastic subject's life defeat is based on poor constitution and personality traits which cause failure in adaptation to life situations. However, to accept life situations which impinge on the individual even in the early years as dynamic factors is the great defect of the meyerian psychobiology. It gives, in other words, lip service to the term dynamic and treats it purely descriptively. The material is so organized in a summarized descriptive form that no truly dynamic reconstruction could be achieved. Life experiences are stressed as important to the individual's fate yet their meaning in terms of the individual is ignored. The earliest infantile situations are virtually overlooked and the patient is considered as crushed by relatively late experiences impinging on a psychobiologic unit poorly prepared for them. What makes him unable to live through the multifarious experiences which are not so specific for his life? In this regard the followers of Meyer ignore the earliest infantile experiences which in their effects on the personality may cause truly dynamic alterations and prepare the way for the future failure in adjustment. These earliest interactions are so completely overlooked in this book that a tremendous amount of work becomes valuable only in a descriptive sense.

The Functions of Human Voluntary Muscles. By Norman D. Royle, M.D., Ch.M., F.R.A.C.S., Senior Orthopaedic Surgeon, Lewisham Hospital, Sydney. Cloth. Price, 3s. 6d. Pp. 42, with 11 illustrations. Sydney & London: Angus & Robertson Limited, 1938.

Dr. Royle developed a remarkable control of the individual muscles of his own body, thus acquiring a unique knowledge of the actions of certain muscles. This knowledge was the basis of a series of lectures in the department of anatomy at the University of Sydney, Australia, which in turn were the basis of this book. He discusses the movements of the vertebral column, jaws, shoulder girdle, upper limbs and lower limbs and emphasizes the importance of a knowledge of the formation as well as of the attachments and nerve supply of a muscle in determining appropriate treatment. Various methods of approach in ascertaining the formation of muscles, namely

anatomic, pathologic, electrical and physiologic methods, are described, and the principal or prime mover, reverse action, fixation muscles and synergic action are discussed. At first thought this book seems elementary, but it is well worth the time of any physician and especially the orthopedic surgeon.

Röntgendiagnostik der Knochen- und Gelenkrankheiten. Von Professor Dr. Robert Klenböck. Heft 5 (Abteilung Gelenkrankheiten): Rheumatoide Gelenkstuberkulose. Paper. Price, 60 marks. Pp. 451-1049, with 610 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1938.

This elaborate and comprehensive book on rheumatoid tuberculosis of the joints, volume 5 in a series on the x-ray diagnosis of bone and joint diseases, is divided into chapters on tuberculosis of the joints of the hand, the shoulder, the foot, the knee, the hip, the sacro-iliac region and the vertebrae. The second part deals with multiple lesions, including diseases, Heberden's nodes and mono-articular infections. There are several excellent illustrations of rhizomelic spondylitis with the bamboo pole appearance involving the cervical thoracic and lumbar vertebrae. The author discusses 378 cases and presents an extensive bibliography under eighteen headings. This fine volume is chiefly a reference book, highly technical and of value to those who read German easily.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Disability from Displacement of Fifth Lumbar Vertebra.—Donker, a man weighing about 200 pounds (90.7 Kg.), in the course of his employment Jan. 3, 1936, fell on his back and could not continue working. His legs felt numb and he had pains in his legs and back. He was taken to a physician in Sioux City for treatment but the pains persisted after several weeks of treatment. The physician then removed the patient's coccyx. The last week in April the physician released the patient, although at the time the patient complained of a burning sensation up and down his spine and numbness in his legs. Another physician, consulted about May 20, prescribed a brace for the lower part of the body and rendered treatment until August 19, but the pains continued to grow worse. On the last date named the workman entered the Veterans' Hospital in Lincoln, Neb., where he was kept in a cast for five weeks and was given a brace, his tonsils were removed and some teeth were extracted. After his release from the hospital, November 3, he instituted proceedings under the workmen's compensation act of Nebraska. At the trial he testified that he had very little use of his legs and was forced to wear the brace continuously, that his legs were numb and that he suffered a burning sensation of the spine and hip pains. The trial court awarded compensation for temporary total disability and the employer and his insurance carrier appealed to the Supreme Court of Nebraska.

The only questions for determination by the Supreme Court were the extent of the injuries suffered by the workman and the nature of the resulting disabilities. A physician who personally supervised the treatment given the workman at the Veterans' Hospital and who examined him during the month preceding the trial testified that in his opinion Donker was permanently and totally disabled. As to the condition of the lower portion of Donker's spine, there was expert testimony that the fifth lumbar vertebra was displaced forward so as to be no longer in line with the sacrum and that the space between the two was wider than normal. That condition, the witness testified, might have been present before the injury, might have been aggravated by the injury or might have been caused entirely by the injury. Donker's family physician, who attended him after his release from the Veterans' Hospital, testified, from the results of examinations made including the use of roentgenograms and his previous knowledge of the patient's condition, that the fall on January 3 would be sufficient to cause the injuries from which he suffered, that in his opinion

the workman's disability was due wholly and entirely to the fall and that the workman was totally and permanently disabled.

The Supreme Court concluded that the finding of the trial court that the workman was suffering from at least temporary total disability was clearly established by the evidence. It was undisputed that prior to January 3 Donker was an able bodied laborer, capable of continuously performing hard work without ill effects. After that date his condition changed markedly. The only explanation offered for that change by the defendant was that the workman was a malingerer. But the evidence, the court thought, preponderated against that conclusion.

Taking into consideration all the evidence, the Supreme Court concluded that the judgment of the trial court awarding compensation was justified. The judgment was therefore affirmed. —*Donker v. Central West Public Service Co. (Neb.)*, 280 N. W. 168.

Society Proceedings

COMING MEETINGS

- American Medical Association, St. Louis, May 15-19. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.
- American Academy of Tuberculosis Physicians, St. Louis, May 13-14. Dr. Arnold Minnig, 638 Metropolitan Bldg., Denver, Secretary.
- American Association for the Study of Goiter, Cincinnati, May 22-24. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.
- American Association for Thoracic Surgery, Los Angeles, July 5-7. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.
- American Association of Genito-Urinary Surgeons, Williamsburg, Va., May 24-26. Dr. Charles C. Higgins, 2050 East 93d St., Cleveland, Secretary.
- American Association of Industrial Physicians and Surgeons, Cleveland, June 5-8. Dr. V. S. Cheney, Armour and Company, Union Stock Yards, Chicago, Secretary.
- American Bronchoscopic Society, Rye, N. Y., May 26. Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.
- American College of Chest Physicians, St. Louis, May 13-14. Dr. Robert B. Homan Jr., 109 North Oregon St., El Paso, Texas, Secretary.
- American Dermatological Association, Montebello, Canada, May 31-June 3. Dr. Fred D. Weidman, University of Pennsylvania Medical Laboratories, Philadelphia, Secretary.
- American Gynecological Society, White Sulphur Springs, W. Va., May 22-24. Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.
- American Laryngological Association, Rye, N. Y., May 24-26. Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.
- American Neurological Association, Atlantic City, N. J., June 5-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.
- American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.
- American Orthopedic Association, Buffalo, N. Y., June 5-8. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
- American Otological Society, New York, May 22-23. Dr. Thomas J. Harris, 104 East 40th St., New York, Secretary.
- American Proctological Society, Brooklyn, N. Y., June 25-27. Dr. Curtice Rosser, 710 Medical Arts Bldg., Dallas, Texas, Secretary.
- American Radium Society, St. Louis, May 15-16. Dr. Frederick W. O'Brien, 465 Beacon St., Boston, Secretary.
- American Rheumatism Association, St. Louis, May 15. Dr. Loring T. Swaim, 372 Marlborough St., Boston, Secretary.
- American Society for the Study of Allergy, St. Louis, May 15-16. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.
- American Urological Association, White Sulphur Springs, W. Va., May 29-June 1. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.
- Associated Anesthetists of the United States and Canada, St. Louis, May 15. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary General.
- Association for the Study of Internal Secretions, St. Louis, May 13-14. Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.
- Connecticut State Medical Society, New Haven, May 25-26. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.
- Maine Medical Association, Poland Springs, June 25-27. Dr. F. R. Carter, 22 Arsenal St., Portland, Secretary.
- Massachusetts Medical Society, Worcester, June 6-8. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.
- Medical Library Association, Newark, N. J., June 27-29. Miss Janet Doe, 2 East 103d St., New York, Secretary.
- Minnesota State Medical Association, Minneapolis, May 31-June 2. Dr. B. B. Souster, 11 West Summit Ave., St. Paul, Secretary.
- Medical Association of Butte, June 28-30. Dr. Thomas L. Elena, Secretary.
- New York, June 1-2. Dr. G. way, New York, Secretary.
- Boston, June 26-29. Dr. Charles J. New York, Secretary.
- Manchester, June 8-9. Dr. Carleton R. cord, Secretary.
- Atlantic City, June 6-8. Dr. Alfred Secretary.
- Society, San Francisco, June 19-22. St., San Francisco, Secretary.
- ion, Spokane, Wash., June 26-29. Dr. le Avenue, Spokane, Wash., Secretary.
- idence, June 7-8. Dr. Guy W. Wells, Secretary.
- Society of Surgeons of New Jersey, Elizabeth, May 25. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.
- Vancouver Medical Association Summer School, Vancouver, B. C., June 6-9. Dr. W. W. Simpson, 203 Medical Dental Bldg., Vancouver, B. C., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

S: 273-304 (Feb.) 1939

- Fallacies in the Conduct of Labor. J. R. Garber, Birmingham.—p. 273.
Diagnosis of Intracranial Tumor. W. A. Smith, Atlanta, Ga.—p. 276.
Diagnosis and Treatment of Pleural Effusions. K. N. Joseph, Birmingham.—p. 281.
Some Clinical Observations in Asthmatic Cases with Methods of Management. J. W. Boggess Jr., Guntersville.—p. 285.

American Heart Journal, St. Louis

17: 131-258 (Feb.) 1939

- Reversible Cardiac Enlargement in a Case of Congenital Cavernous Hemangioma. R. Matas and B. R. Heninger, New Orleans.—p. 131.
Calcereous Disease of the Aortic Valve: Study of 228 Cases. T. J. Dry and F. A. Willius, Rochester, Minn.—p. 138.
Evaluation of Heart Volume Determinations by the Rohrer-Kahlstorf Formula as a Clinical Method of Measuring Heart Size. W. J. Comeau and P. D. White, Boston.—p. 158.
*Effects of Alkalosis and of Acidosis on the Human Electrocardiogram. P. S. Barker, Ann Arbor, Mich.; E. L. Shrader and Ethel Ronzoni, St. Louis.—p. 169.
Studies on Mercurial Diuresis: II. Immediate Effect on Venous Blood Pressure. I. F. Volini and R. O. Levitt, Chicago.—p. 187.
Plethysmographic Studies of Peripheral Blood Flow in Man: I. Criteria for Obtaining Accurate Plethysmographic Data. D. I. Abramson, H. Zazeela and J. Marrus, Cincinnati.—p. 194.
Id.: II. Physiologic Factors Affecting Resting Blood Flow in the Extremities. D. I. Abramson, H. Zazeela and J. Marrus, Cincinnati.—p. 206.
Use of Magnesium Sulfate in Measurement of Circulation Time. M. Bernstein and S. Simkins, Philadelphia.—p. 218.

Effects of Alkalosis and Acidosis on Electrocardiogram.—Barker and his co-workers observed pronounced flattening of the T waves in a patient with hysterical overventilation and tetany. This prompted an experimental investigation of the effects of alkalosis and acidosis on forty electrocardiograms of seven human volunteers. Alkalosis produced by voluntary overventilation or by the ingestion of sodium bicarbonate was accompanied by a reduction in the amplitude of the T wave. Acidosis produced by exercise or by the ingestion of ammonium chloride was accompanied by an increase in the amplitude of the T wave. While the clinical application of these observations is probably quite limited, they may offer an explanation for occasional electrocardiographic changes not otherwise understood.

American Journal of Cancer, New York

35: 159-326 (Feb.) 1939. Partial Index

- Changes in the Nature of the Stroma in Vagina, Cervix and Uterus of the Mouse Produced by Long-Continued Injections of Estrogen and by Advancing Age. L. Loeb, V. Sontzeff and E. L. Burns, St. Louis.—p. 159.
Relative Potency of Carcinogenic Compounds. J. Iball, London, England.—p. 188.
Effect of Diet on Tumors Induced by Ultraviolet Light. C. A. Baumann and H. P. Rusch, Madison, Wis.—p. 213.
Blood Groups in Relation to the Agglutination of Human Red Blood Corpuscles by Heterologous (Rat) Serums. T. Lumsden, London, England.—p. 222.
Radioactivity of Potassium in Tumor Tissue. A. Lasnitzki, Manchester, England.—p. 225.
Sex as a Factor in the Prognosis of Hodgkin's Disease. E. Epstein, Oakland, Calif.—p. 230.
Sarcoma of Soft Tissues. E. M. Burke, Buffalo.—p. 234.
Multiple Malignant Tumors, with Involvement of the Lower Bowel: Report of Multiple Primary and Contact Growths. H. E. Bacon, Philadelphia.—p. 243.
Tumor-like Hyperplasia of the Interstitial Cells in the Testis: Case. B. Snellman.—p. 258.
A Hopeful Factor in the Cancer Problem. W. C. MacCarty Sr., Rochester, Minn.—p. 275.

American J. Obstetrics and Gynecology, St. Louis

37: 183-362 (Feb.) 1939. Partial Index

- Occurrence and Significance of Nucleated Erythrocytes in Fetal Vessels of Placenta. C. T. Javert, New York.—p. 184.
*Effect of Calcium on Uterine Contractions and on Uterine Response to Intravenously Injected Oxytocics. D. N. Danforth and A. C. Ivy, Chicago.—p. 194.
Urologic Complications Following Complete and Supravaginal Hysterectomy: Comparative Study. A. J. Murphy, New York.—p. 201.
Critical Analysis of Blood Loss Following Delivery, with Special Reference to Value of Ergotrate. A. M. Reich, New York.—p. 224.
*Etiologic Factors in Sterility: Report of Study of 150 Cases. J. Kotz and Elizabeth Parker, Washington, D. C.—p. 233.
Neonatal Mortality at the Philadelphia Lying-in Hospital: A Seven Year Study. R. M. Tyson, Philadelphia.—p. 241.
Postpartum Hemorrhage as Cause of Death. C. T. Beecham, Philadelphia.—p. 258.
Inhibiting Effect of Pentavalent Arsenicals on Trichomonas: Comparative Efficacy and Toxicity of Aectarsone, Carbarsone and Aldarsone in Laboratory Studies. A. E. Rakoff, Philadelphia.—p. 265.
Treatment of Pelvic Inflammation by Iontophoresis of a Choline Compound. A. Jacoby, New York.—p. 272.
Comparative Study of Effectiveness of Two Antiseptics in Preventing Infection Following Delivery: Report on 1,000 Cases. J. E. Tritsch, New York.—p. 277.
Use of Blood Transfusions in Treatment of Pyelitis Complicating Pregnancy. L. H. Douglass and K. Laughlin, Baltimore.—p. 282.
Blood Sugar Changes in Labor and After Delivery. A. L. DeCamp, Fayetteville, N. C.—p. 285.
Relation Between Hydatid Moles, Relative Ischemia of the Gravid Uterus and the Placental Origin of Eclampsia. E. W. Page, Berkeley, Calif.—p. 291.
*Bartholinitis and Skeneitis Due to Trichomonas Vaginalis. H. A. Shlanski and S. P. Savitz, Philadelphia.—p. 294.
Tubal Pregnancy with Tuberculous Salpingitis. C. S. Stevenson and L. R. Wharton, Baltimore.—p. 303.
Successful Termination of Pregnancy Following Bilateral Sympathectomy. J. M. Melick, Worcester, Mass.—p. 334.

Effect of Calcium on Uterine Contractions.—Danforth and Ivy find that calcium is necessary for the maintenance of the tone, contractility and coordinated activity of the postpartum uterus of the dog and rabbit. When the available calcium is sufficiently reduced by the use of soluble sodium hexameta-phosphate, uterine contractions do not occur. The oxytocic action of pitocin, ergonovine and histamine is potentiated by calcium. Doses of pitocin, ergonovine and histamine, which are normally adequate for a uterine response, are ineffective when the available calcium is diminished.

Etiologic Factors in Sterility.—During the last four years Kotz and Parker studied completely 150 patients with the primary complaint of sterility. The etiologic factors in sterility in the female are grouped as (1) constitutional abnormalities, (2) organic pelvic pathologic conditions, (3) closed tubes and (4) endocrine abnormalities. In the male sexual incompetence is usually the etiologic factor. In every sterile couple a multiplicity of factors were operative. Absolute sterility was always due primarily to a specific organic pelvic pathologic condition. Relative sterility was usually due to many less serious factors. The secondary sterilities, as judged from their past histories, had a lowered fertility irrespective of the factors operative at the time of the examination. In the relative sterilities, pathologic changes in the pelvis, closed tubes, endocrine factors and male incompetence were the causes of the sterility, the significance of each being dependent on the severity of the condition and its association with other factors. Sterility due to a single fault was rare. Constitutional factors were not found to be the cause of sterility in any case. Endocrine factors were found to be important in the production of sterility. Blood hormone tests are valuable in determining the etiology of ovarian failure. The endometrial biopsy is the most accurate method of determining the type and degree of ovarian failure. There is no specific routine treatment for sterility. The one aim is to correct as many faults as possible. Of the 120 patients with relative sterility, thirty received no treatment. Twelve patients did not follow the treatment for the prescribed time. Seventy-eight patients with relative sterility were treated. There have been forty-one pregnancies, thirty-five of which were normal, five were miscarriages and one was ectopic. There were no instances of fetal abnormalities. Thirteen cases were considered failures and twenty-four patients are still under treatment. Of the thirty cases of absolute sterility the specific causes were as follows: The tubes had been previously removed in four, a large fibroid uterus was present in four, there was one case of bilateral chocolate cysts of the ovaries and one of sclerotic

ovaries, there were thirteen instances of closed tubes which could not be opened, pelvic inflammatory disease with closed tubes accounted for five cases and there were two cases in which male incompetence was the only cause.

Trichomonas Bartholinitis and Skeneitis.—According to Shelanski and Savitz, *Trichomonas vaginalis* has been demonstrated in Bartholin and Skene's glands and is a specific factor in producing bartholinitis and skeneitis. The presence of *Trichomonas vaginalis* in these glands is the source for reinfection in recurrent cases of *Trichomonas vaginalis* vaginitis. Injection of the glands with a 1 per cent solution of silver picrate has been found useful in treating this infestation.

American Journal of Public Health, New York

29: 95-196 (Feb.) 1939 Partial Index

- Duration of Immunity Conferred by Typhoid Vaccine Results of Revaccination by Intracutaneous Injection of Typhoid Vaccine J. F. Silex and G. C. Dunham, Washington, D. C.—p. 95
Serologic Tests in Diagnosis of Syphilis. Elizabeth Maltaner, Albany, N. Y.—p. 104.
Studies on Trichinosis. XI. Epidemiology of *Trichinella Spiralis* Infestation and Measures Indicated for Control of Trichinosis W. H. Wright, Washington, D. C.—p. 119
Preparation of Scarlet Fever Toxin Mary E. Evans and R. Y. Gottschall, Lansing, Mich.—p. 139
Results of Venereal Disease Control in Canada G. Bates, Toronto—p. 143.
Industrial Hygiene Program in a State Health Department C. A. Nau, Austin, Texas—p. 151

Archives of Ophthalmology, Chicago

21: 409-576 (March) 1939

- *Common Wart as Etiologic Factor in Certain Cases of Conjunctivitis and Keratitis. A. de Rötth, Chicago—p. 409
*Ocular Importance of Sarcoid Its Relation to Uveoparotid Fever F. B. Walsh, Baltimore—p. 421
Spatial Disorientation with Homonymous Defects of the Visual Field M. Kanzer and M. B. Bender, New York—p. 439
The Hughes Procedure for Rebuilding a Lower Lid S. R. Gifford, Chicago—p. 447.
Localizing Value of Incongruity in Defects in Visual Fields D. O. Harrington, San Francisco—p. 453
Syndrome of Tuberosus Sclerosis Report of Case T. L. P. Koch and M. N. Walsh, Rochester, Minn.—p. 465
Operative Treatment of Radiation Cataract A. B. Reese, New York—p. 476
Fusional Movements: Role of Peripheral Retinal Stimuli H. M. Burian, Hanover, N. H.—p. 486
Precocious Cataracts and Scleroderma (Rothmund's Syndrome, Werner's Syndrome). Report of Case S. A. Agatston and S. Gartner, New York—p. 492.
(a) Leiomyoma and (b) Hematoma of the Iris Report of Cases E. C. Ellett, Memphis, Tenn.—p. 497.
Fundus Oculi in Generalized Hypertension and Arteriosclerosis R. Salus, Prague, Czechoslovakia, translated by E. Waldstein, New York—p. 505.
Vertical Prism Imbalances in Bifocal Lenses Coexistent with Hyperphoria S. L. Olsho, Philadelphia—p. 515.
Diseases of the Choroid M. Cohen, New York—p. 522

Common Wart in Etiology of Conjunctivitis and Keratitis.—De Rötth summarizes his experience with ocular diseases caused by common warts of the eyelids, which he first described in 1933. He has encountered seven cases of unilateral conjunctivitis, mostly of the subacute form, and three cases of keratitis of different types in connection with these warts. An additional case of bilateral conjunctivitis is reported in which warts occurred on the lids of both eyes. The virus of the wart is considered to be the etiologic factor in these cases. This view is based on the conformity of the following facts: the unilateral appearance; the involvement of the superficial layers of the eye, which points to an exogenous factor; the resistance toward the usual treatment; the presence of one or several warts on the margin of the eyelid of the diseased eye; the quick recovery after the removal of the warts, and the analogy to molluscum conjunctivitis. On the basis of these facts, the author believes that all inclusion diseases of the skin are able to attack the eye.

Ocular Importance of Sarcoid.—Walsh cites several cases which give, he believes, further clinical and histologic evidence that uveoparotid fever and sarcoid are closely related diseases. The protean ocular manifestations of uveoparotid fever and sarcoid are exemplified by the case reports. Although ocular tissues were involved in all the cited cases, many cases of sarcoid occur in which the eyes are not affected. Therefore he believes that it is no longer necessary to labor the point that

uveoparotid fever and sarcoid are similar diseases and may be different manifestations of the same disease. Sarcoid and uveoparotid fever are closely allied conditions for which the cause is not known, but it will probably be proved that they are due to tuberculosis.

Arkansas Medical Society Journal, Fort Smith

35: 187-208 (March) 1939

- The Female Castrate Postoperative Care from an Endocrine Standpoint for the General Practitioner. G. R. Siegel, Clarksville—p. 187
Id. E. H. Hunt, Clarksville—p. 189.
Immunology and Laboratory Diagnosis of Syphilis M. J. Kilbury, Little Rock—p. 191.

California and Western Medicine, San Francisco

50: 81-168 (Feb.) 1939

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California State Hospitals The Problem of Overcrowding A. J. Rosanoff, Sacramento—p. 109
Immunization Procedures Report of the Committee E. B. Shaw, San Francisco, P. Hamilton, Alhambra, and H. E. Stafford, Oakland—p. 112
Blind Laws of California Some Comments J. P. Lordan, Los Angeles—p. 114.
Plea for Conservative Obstetrics A. Bernstein, San Francisco—p. 118

Delaware State Medical Journal, Wilmington

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- The National Health Program and American Medicine. M. Fishbein, Chicago—p. 17.
Biologic Aspect of Traumatic Injuries N. R. Washburn, Milford—p. 28

Florida Medical Association Journal, Jacksonville

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- Diagnosis and Treatment of Amebic Dysentery. J. L. Borland, Jacksonville—p. 381
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Georgia Medical Association Journal, Atlanta

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- Crystalline Insulin M. Sahyun, Detroit—p. 39.
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Treatment of Varicose Veins Recent Trends. M. M. Hagood, Marietta—p. 47.
Diagnosis and Modern Handling of Patients with Cutaneous Syphilis H. S. Alden and J. W. Jones, Atlanta—p. 49.
*Symptoms Occurring with Sulfanilamide Relieved by Nicotinic Acid Preliminary Report A. P. McGinty, G. T. Lewis and M. R. Holtzclaw, Atlanta—p. 54.
Contraception M. O. Corbitt, Augusta—p. 56
Operation for Rectal Prolapse Report of Case. H. W. Long, Milledgeville—p. 58.
Osteomyelitis and Compound Fractures Treatment with Zinc Peroxide and Cod Liver Oil. P. B. Wright, Augusta—p. 59.
Obstetrics in the Home. R. B. Crichton, Augusta—p. 61.
Hypertrophic Pulmonary Osteoarthropathy Report of Case. E. D. Hollis and E. B. Agnor, Atlanta—p. 63
Nissl Substances in the Nerve Cells of Teratoma J. Krafka Jr., Augusta—p. 64

Sulfanilamide Reactions Relieved by Nicotinic Acid.—If the administration of nicotinic acid to patients suffering from pellagra or radiation sickness will ameliorate the symptoms and decrease or eliminate the excretion of abnormal porphyrin, McGinty and his colleagues wondered whether it would have the same desirable effect on patients ingesting sulfanilamide. They have given nicotinic acid to a number of Negro patients receiving large doses of sulfanilamide while they were confined to bed in the hospital. A control urine specimen was obtained before sulfanilamide was administered. During the period of observation, symptoms were carefully noted. On the fourth day of medication, in addition to the sulfanilamide, administration of nicotinic acid was begun in doses of 50 mg. three times a day. Throughout the period of this regimen twenty-four hour specimens of urine were collected and an oxalated specimen of blood was obtained daily. Quantitative determinations of sulfanilamide were made on the blood and urine specimens by the method of

Marshall and Litchfield. Urinary porphyrin was detected by ether extraction of an acidified sample of urine, concentration of the ether extract, acidification with 10 per cent hydrochloric acid and examination with the spectroscope. The response of the patients to the additional administration of nicotinic acid has been most gratifying. The unpleasant symptoms and the porphyrinuria were decreased. The most definite clinical change observed was a clearing of mental apathy so often present with the ingestion of sulfanilamide.

Iowa State Medical Society Journal, Des Moines

20: 47-90 (Feb.) 1939

- Brain Tumors in Children P C Buey, Chicago—p 47
Scientific Tests for Intoxication Further Studies H W. Morgan, Mason City—p 53
Latent Infections of the Mastoid F F Agnew, Independence—p 55.
Institutional Epidemic Mastoiditis S G Hands, Davenport—p 58
What Do We Mean by Antiseptic Surgery? H W Orr, Lincoln, Neb.—p 60

Journal of Bacteriology, Baltimore

37: 111-236 (Feb.) 1939

- Precursors to the Formation of Creatinine by Bacteria C. H. Fish and T D Beckwith, Los Angeles—p 111
Comparative Study of Use of Varying Concentrations of Agar in Test Medium Used to Detect Contaminants in Biologic Products Carolyn R Falk, Helen Bienasz Bucca and Margaret P Simmons, New York.—p 121.
Double Zone Beta Hemolytic Streptococci Their Cultural Characteristics, Serologic Grouping, Occurrence and Pathogenic Significance J H. Brown, Baltimore—p 133.
Physiologic Youth as Important Factor in Adaptive Enzyme Formation C P. Hegarty, Ithaca, N Y—p 145
Method for Producing Increased Carbon Dioxide Tension in Individual Culture Tubes and Flasks. H. J. Shaughnessy, Denver.—p 153.
Growth Factor Requirements of the Root Nodule Bacteria P M West and P. W. Wilson, Madison, Wis—p 161
Determination of Histamine in Bacterial Cultures A H Eggerth, R. J. Littwin and Joyce V Deutsch, Brooklyn.—p 187.
Production of Histamine in Bacterial Cultures. A. H. Eggerth, Brooklyn.—p 205.

Journal of Immunology, Baltimore

36: 83 192 (Feb.) 1939

- Anaphylaxis in the Rhesus Monkey I. Horse Serum as an Antigen. Lenore M. Kopeloff and N Kopeloff, New York—p 83.
Id II. Egg White as an Antigen Lenore M Kopeloff and N. Kopeloff, New York—p. 101
Study of Meningococcus Cultures from Horses Immunized Against Meningococci Sophia M Cohen, Albany, N. Y—p 129
Antigenic Relationships of Pneumococci to Erythrocytes and Organs of Men and Animals. A J Weil and C Sherman, Pearl River, N. Y.—p 139
Neutralization of Vaccine Virus by Serum of Vaccine-Immune Animals. R F Parker, Cleveland—p 147
Nonspecific Factors in Resistance I Capacity to Sustain Effective Circulation A Locke, Pittsburgh—p 159
Id II Ability to Withstand Shock A Locke and E R Main, Pittsburgh—p 173
Id III Capacity for Retarding Bacterial Proliferation A Locke, E R Main and R R Mellon, Pittsburgh—p 183

Laryngoscope, St. Louis

49: 69 134 (Feb.) 1939

- Diseases of the Larynx Material Abstracted During the Year 1938 H. B. Orton, Newark, N J—p 69
Indication for Surgery in Meningitis Secondary to Disease of the Middle Ear and of the Nasal Sinuses, Reservations in Early Surgical Intervention H M Goodyear, Cincinnati—p 102
Internal Jugular Vein Thrombosis Secondary to Lateral Pharyngeal Abscess Case Report G B Gilmore, New York—p 106
Observation on Behavior of Leukocytes in Nasal Mucus (Preliminary Report) H A Schatz, Philadelphia—p 111.
Ionization for Control of Severe Hypertensive Epistaxis. A L Beck, New Rochelle, N Y—p 113
Adamantinoma of the Superior Maxilla with Intracranial Extension S Androp, Baltimore—p 119
Procaine Idiosyncrasy and Cervical Phlegmon as Complications Following Local Anesthesia for Tonsillectomy. Case Report. H. D. Harlowe, Virginia, Minn—p 123

Ionization for Hypertensive Epistaxis.—Beck has controlled severe hypertensive epistaxis by ionization in three cases in which ligation of the external carotid was considered. The ionization, or iontophoresis, as has been employed for vasomotor rhinitis and hay fever, brought about permanent control of the epistaxis. The first was done nearly three years ago and there has been no epistaxis since in any of the patients. All three patients have a well marked arteriosclerosis. The thick fibrinous membrane of coagulative necrosis that immediately

forms on the surface seems to act as a perfect blanket or cover and seals the leaking vessels. Whatever undesirable changes are produced in the mucous membrane may be considered the lesser of two evils, for control of the bleeding is the immediate necessity. The resulting submucosal fibrosis probably prevents repetitions of the bleeding. In all the cases, packing had been inserted repeatedly in an endeavor to stop the bleeding. In carrying out the procedure the packing which has been placed in the nose to control bleeding is removed a little at a time and to the enlarging nasal surface cocaine and epinephrine solution is applied topically. It is advisable to anesthetize the opposite side of the septum when only one side is involved. The ionizing pack and incorporated electrode are then introduced in the customary manner and the current is applied. A current strength of 10 milliamperes for ten minutes produces a good surface membrane. After-treatment consists of deliberate nonintervention, particularly while the pseudomembrane is present. Sedatives or narcotics are usually necessary from the first twelve to twenty-four hours. After the membrane has come away an attempt at preventing the formation of adhesions which tend to form at places at which the space is very narrow is justified. They do no particular harm.

Mental Hygiene, Albany, N. Y.

23: 1-176 (Jan.) 1939. Partial Index

- Significance of Research in Mental Disorders A. Gregg, New York.—p. 1
General Principles of Psychotherapy. E. G. Billings, Denver.—p. 25
The Child Reveals Himself Through Play. Method of Play Intervention. J. H. Conn, Baltimore.—p. 49.
Case Work in an Authoritarian Setting. J. Slawson, New York.—p. 70.
Can the Alcoholic Become a Moderate Drinker? Anonymous.—p. 80
Results and Problems of Group Psychotherapy in Severe Neuroses P. Schilder, New York.—p. 87.
Experiment in Training Nurses to Help Mothers in Preventive Mental Hygiene J. Levy, Trenton, N. J.—p. 99.

New England Journal of Medicine, Boston

220: 221-268 (Feb. 9) 1939

- An Episode in Massachusetts in 1818 Related to the Teaching of Anatomy. F. C. Waite, Cleveland—p 221.
*Cerebrospinal Fluid in Optic Neuritis, "Toxic Amblyopia" and Tumors Producing Central Scotomas A. L. Watkins, Boston—p. 227.
Regional Enteritis Study of Five Cases W. A. R. Chapin, Springfield, Mass—p. 232.
Polyposis of the Small Intestine Report of Five Cases E. A. Shaw, Providence, R. I.—p. 236
Gynecology. J. V. Meigs, Boston—p. 242.

Cerebrospinal Fluid and Vision.—From his examination of 120 patients who came to the hospital because of failing vision, the diagnosis in forty of whom was acute retrobulbar neuritis, Watkins concludes that the cerebrospinal fluid in acute cases is normal except in those caused by multiple sclerosis. In these, which form from 25 to 50 per cent of the group, the colloidal gold curve may show a strong first zone reaction. In thirty-nine cases of chronic retrobulbar optic neuritis the onset of the visual disturbance was slow and gradually progressive over a period of months rather than weeks. The average age (39) was somewhat higher than in the acute cases (33), with 62 per cent of patients more than 40 years of age. Both eyes were affected slightly more frequently (54 per cent) than one alone and the eyeballs were tender and painful in only 22 per cent. Pallor of the optic disks was usually observed (72 per cent), but they were hyperemic in 21 and normal in 7 per cent. The characteristic field was a central scotoma, and the visual impairment showed progression to nearly complete blindness. Lumbar punctures revealed no abnormality in initial pressure, cellular content, total protein or colloidal gold curve. The etiology was unknown in 85 per cent of the cases and proved to be multiple sclerosis in 15 per cent. The average age in the thirty cases diagnosed was 52. The course was one of slow progressive loss of vision in the two eyes, although not necessarily equally. The eyeballs were in no case tender and the optic disks were either normal or slightly pale. The diagnosis was made from visual field examinations, the characteristic field being a cecocentral scotoma, although in some cases it was made from a history of overindulgence in alcohol and tobacco and the presence of a central scotoma similar to retrobulbar neuritis, and 40 per cent of these patients improved after reducing or stopping the use of tobacco or alcohol. Cere-

brospinal fluid examinations showed initial pressures which were usually normal. The total protein averaged 33 mg. per hundred cubic centimeters, being distinctly abnormal in only two cases. The colloidal gold curve was negative in all cases. Five patients showed a diminution of vision, papillitis and a constricted field of vision. These five patients were between 4 and 44 years of age. There was tenderness of the eyeball in only one case. There was slight choking of the optic disks and peripheral constriction of the visual fields and some had only unilateral involvement. Lumbar punctures showed normal initial pressures. All cases were of fairly rapid onset, and normal vision was regained. A pansinusitis occurred coincidentally in two cases and hay fever in another. One patient had a definite lead intoxication which seemed of etiologic significance. Of six other patients with optic neuritis, three had transverse spinal cord lesions and retrobulbar neuritis which was thought to be on an unclassified infectious basis but fitted into the clinical syndrome of optical neuromyelitis. The other three had blindness with central scotomas and multiple peripheral neuritis. A necropsy in one of these cases revealed extensive periarteritis. In the three cases of optical neuromyelitis and the two of multiple peripheral neuritis with optic neuritis there was definite abnormality of the cerebrospinal fluid. In the case of periarteritis the fluid was normal. In an additional twenty-two tumor cases and failing vision the author found that the cerebrospinal fluid pressure, cellular content and colloidal gold curve may all frequently be within normal limits but that the total protein is usually increased from two to five times the normal when there is present a central scotoma from the pressure of tumors or aneurysms on the optic nerves or chiasm.

Public Health Reports, Washington, D. C.

54: 205-244 (Feb. 10) 1939

- Epidemiologic Study of Poliomyelitis in the District of Columbia. C. C. Dauer.—p. 205.
 *Mottled Enamel in South Dakota. H. T. Dean, E. Elvove and R. F. Poston.—p. 212.
 Effect of Artificial Temperatures on Stability of Neosarsphenamine. T. F. Probey and W. T. Harrison.—p. 228.

Mottled Enamel in South Dakota.—Dean and his associates state that there are forty-one communities in South Dakota, divided among twenty counties, in which endemic mottled enamel has been demonstrated by survey. In addition there are thirty other places in which mottled enamel is probably endemic. The endemicity is seemingly limited to the smaller communities and rural districts in which the inhabitants obtain their domestic water from the Dakota sandstone, that is, users of artesian water.

Radiology, Syracuse, N. Y.

32: 131-260 (Feb.) 1939

- Application of Sialography in Non-Neoplastic Diseases of the Parotid Gland. J. V. Blady and A. F. Hocker, New York.—p. 131.
 Roentgen Therapy by the Method of Chaoul. E. P. Pendergrass, P. J. Hodess and C. J. Garrahan, Philadelphia.—p. 142.
 Cholecystography: Single Dose versus Double Dose Methods of Administering the Dye. M. Feldman, Baltimore.—p. 155.
 Influence of Ultraviolet Rays on Body Weight. F. Ellinger, Copenhagen, Denmark.—p. 157.
 Treatment of Carcinoma of Breast: Technic, Complications and Results. Elizabeth Newcomer, Denver.—p. 161.
 Paraplegia from Erosion of Vertebral Column by Large Thoracic Aneurysm. M. J. Hubeny and P. J. Delano, Chicago.—p. 171.
 The Pulmonary Artery: Roentgenographic and Roentgen Kymographic Study. S. Brown, J. E. McCarthy and A. Fine, Cincinnati.—p. 175.
 Cross Sectional Radiography of Heart. G. Danielis, Chicago.—p. 190.
 *Treatment of Erysipelas with Ultraviolet Energy. M. E. Knapp, Minneapolis.—p. 195.
 Diagnostic Pneumothorax. S. Schnur, New York.—p. 198.
 Effect of Cable Length on Radiation Output of Shock-Proof X-Ray Tubes. T. H. Rogers, Springdale, Conn.—p. 202.
 Use of Roentgen Therapy in Carotid Sinus Syndrome. C. A. Stevenson, Temple, Texas.—p. 209.
 Median Rhomboid Glossitis. J. F. Sammet, Chicago.—p. 215.
 Value of Assessing and Prescribing Dosage in Radiation Therapy in Simple Terms. R. Paterson, Manchester, England.—p. 221.

Treatment of Erysipelas with Ultraviolet Energy.—Knapp combines the reports of Titus and Jenkins (who treated eighty-one and fifty cases, respectively) with that of his own (510 cases) on the efficacy of ultraviolet radiation in the treatment of erysipelas. Experience shows that the dosage should be heavy so that the original dose suggested by Ude (twice the

erythema dose) has now been increased to from ten to twenty times the erythema dose. A border of 3 or 4 inches of normal skin around the involved area is included in the treatment. If multiple exposures are necessary, the edges are allowed to overlap. If the eyelids are not involved the eyes are covered with black paper or cotton to prevent an ultraviolet conjunctivitis. If the eyelids are involved the patient is instructed to keep his eyes closed during the treatment. Moist packs are prohibited for from twelve to twenty-four hours after the treatment, as they interfere with the proper development of the erythema. Usually no packs are necessary. If the skin feels stiff after the erythema develops, a little petrolatum may be applied to relieve it. If the lesion spreads, the same or an even heavier dose of ultraviolet is given the next day. Most of the patients remark about the relief of pain, which often occurs while the lamp is still being applied. Later there is some increased edema of both the area of erysipelas and the surrounding normal skin. This subsides in from twenty-four to forty-eight hours, and if no further spread or complications occur the temperature drops rapidly to normal, the treated area wrinkles and then desquamates, and in five or six days the entire area is replaced with new skin. In the majority of cases only one treatment is necessary. A comparison of the three series shows that the average number of treatments per case (from 1.3 to 2.06) and the average number of days (from 3.13 to 4.58) from treatment to normal temperature are nearly the same in the three series. The percentage of deaths (7.4) is much greater in the Minneapolis series than in the others (2.4 and 2). It is probable that this can be explained by the fact that Titus and Jenkins' patients were largely private cases, while the author's series was composed entirely of charity patients, many of whom waited until the last moment before allowing themselves to be taken to a hospital. Eighteen of the deaths occurred in cases in which some factor other than erysipelas was the primary cause of death. The greatest value of ultraviolet is shown in the treatment of erysipelas in infants. Erysipelas has always been feared as an extremely fatal disease in small children. Of fifteen children less than 1 year of age treated with ultraviolet radiation, only two died. To this may be added three private cases without a death.

Rhode Island Medical Journal, Providence

22: 19-38 (Feb.) 1939

- Hepatobiliary Syndromes. E. A. Field, Providence.—p. 19.
 The Art of General Anesthesia. P. A. Kees, Springfield, Mass.—p. 27.

Southwestern Medicine, El Paso, Texas

23: 35-66 (Feb.) 1939

- Treatment of Nephroptosis. C. H. Arnold and L. V. Gibson, Lincoln, Neb.—p. 35.
 Perinephric Abscess with Ureteral Obstruction. K. D. Lynch and R. F. Thompson, El Paso, Texas.—p. 38.
 Lateral Gastroduodenostomy in Surgical Treatment of Duodenal Ulcer. V. C. Hunt, Los Angeles.—p. 39.
 Surgical Management of Acute Appendicitis. J. R. Phillips, Houston, Texas, and L. F. Knoepf, Beaumont, Texas.—p. 44.
 Medical Care for Low Income Groups. J. R. Scott, Albuquerque, N. M.—p. 46.
 *Presence of Coccidioid Infection in Phoenix. E. W. Phillips, Phoenix, Ariz.—p. 48.

Coccidioid Infection in Phoenix.—Phillips has encountered eight typical delayed positive reactions to coccidioidin in the district of Phoenix, Ariz. Two of these positively reacting patients have spent a summer in California within the last two or three years; another lived there for eight years and probably became infected there. Of the eight positive reactors, seven are known to be sensitized to foods, pollens or both. The remaining patient has symptoms and physical signs (including persistent eosinophilia) strongly suggesting the presence of atopic disease but the offending organism has not been found. In three of the allergic patients, prompt relief of symptoms followed the positive reaction. Another, with an excessive local reaction, suffered for three days from malaise, generalized aching and nausea, but no fever. This evidence justifies the suspicion that coccidioidomycosis is present in Phoenix, apparently in a chronic form not previously described. Unless the coccidioidin test is not specific, this organism is a factor in certain cases of asthma and chronic bronchial infection.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 257-312 (Feb. 11) 1939

- Virus Diseases. G. M. Findlay.—p. 257.
Intra-Uterine Aspiration. B. Lorincz and A. Davis.—p. 261.
Direct Inguinal Hernia. W. G. Gill.—p. 263.
*Transmission of Syphilis by Blood Transfusion. J. A. W. McCluskie.—p. 264.
Suggested Skin Protective. P. B. Mumford.—p. 266.
Clinical and Social Survey of Male Linen Weavers. J. Deeny and H. S. Booker.—p. 267.

Transmission of Syphilis by Blood Transfusion.—McCluskie reports a case of syphilis transmitted by a blood transfusion. The disease did not show itself until two months after transfusion, unless a few reddish macules on the arm were early secondary manifestations—syphilis d'emblée. In both the donor and the recipient the disease responded to relatively small doses of arsenic and bismuth preparations. The Wassermann reactions of the donor and the patient were both tested at the time of the transfusion and were negative, and neither presented any sign of the disease. The donor had jaundice shortly after giving the blood, and the recipient two weeks after transfusion. Two other authentic cases are reviewed from which it is clear that syphilis can be transmitted from donors who are clinically and serologically negative. This fact should be explained to prospective donors, so that, by careful questioning, one may be able to rule out those who have been exposed to infection during the preceding two months. It has been suggested that the greatest safeguard against such accidental transmission of syphilis would be to employ cadaver blood obtained according to the technic of Yudin (1936). Apart from the natural prejudice which the general public in England might have to the practice, it would be possible only when conducted on a large scale with considerable laboratory facilities. It may in the future be practicable to add some innocuous antiseptic—for example, acriflavine—to the blood for a sufficient period before transfusion to ensure sterility. The author has added a small amount of neoarsphenamine (0.45 Gm.) to the transfused blood in emergency cases in which there has been doubt with no untoward effect. These measures were purely empirical, and he has no proof of their efficacy. In addition to the risk to the patient there is the possibility of an action for damages against the doctor who transmits syphilis by transfusion.

Lancet, London

1: 249-308 (Feb. 4) 1939

- X-Ray Kymography of the Heart. F. G. Wood.—p. 249.
*Treatment of Pneumonia with Sulfapyridine. T. F. Anderson, with bacteriologic observations by R. M. Dowdeswell.—p. 252.
Chronic Constrictive Pericarditis. J. B. Hunter and T. East.—p. 255.
Ossification of the Vertebral Body. T. J. B. A. MacGowan.—p. 258.
Neoplastic Cysts Communicating with the Ventricular System: Report of Case. W. McKissock.—p. 259.
Metabolic Eczema in Idiopathic Steatorrhea. I. D. Riley.—p. 262.
Osteomalacia of the Spine Associated with Chronic Diarrhea. J. M. Holmes.—p. 264.
*Chemotherapy in Plague Infection. H. Schütze.—p. 266.

Sulfapyridine in Pneumonia.—Anderson and Dowdeswell compare the results in fifty cases of pneumonia treated with sulfapyridine with fifty cases in which nonspecific treatment was given. There were eight deaths in the latter series as compared to one in the series treated with sulfapyridine. The course of the disease was considerably modified by sulfapyridine and the pyrexial period was reduced. The drug appeared to be active against all types of pneumococci.

Chemotherapy in Plague Infection.—Schütze tested the efficacy of a benzylsulfanilamide derivative, sulfapyridine and a diaminodiphenylsulfone glucoside against infection (experimental) with *Bacillus pestis* in mice and rats. All three compounds produced a definite therapeutic effect; sulfapyridine was more potent than either in both rats and mice. The benzylsulfanilamide derivative protected rats but not mice and the diaminodiphenylsulfone glucoside protected mice but not rats. Anti plague serum injected subcutaneously at the same time as the test dose of *Bacillus pestis* produced results comparable with those of sulfapyridine. Future experiments may show whether a combination of the two treatments is superior to either alone.

Medical Journal of Australia, Sydney

1: 131-172 (Jan. 28) 1939

- Eye, Ear and Fingertip. W. A. Osborne.—p. 131.
Alcoholism and Its Treatment. J. Bostock.—p. 136.
Notes on "Cardiazol" Therapy in Schizophrenia. C. R. D. Brothers and Isabel Williams.—p. 138.
The Stiff Joint. E. B. M. Vance.—p. 139.
Studies in the Urinary Excretion of Vitamin C in Certain Diseases of Children. S. Williams and Margaret Green.—p. 145.
Role of the Bandicoot in the Epidemiology of Q Fever: Preliminary Study. E. H. Derrick, D. J. W. Smith, H. E. Brown and Mavis Freeman.—p. 150.

Quarterly Journal of Medicine, Oxford

8: 1-78 (Jan.) 1939

- Spontaneous Pneumothorax. K. M. A. Perry.—p. 1.
*Insulin Resistance and Diagnosis of Thyroid Disease. W. J. Griffiths.—p. 23.
Further Studies of Plasma Lipids in Toxic Goiter: Evidence Suggesting a Bimodal Distribution. E. M. Boyd and W. F. Connell.—p. 41.
Plasma Lipids in Anxiety States and Their Comparison with Lipopenia of Hyperthyroidism. E. M. Boyd, W. F. Connell and A. M. Doyle.—p. 47.
Obesity, Hypogenitalism, Mental Retardation, Polydactyly and Retinal Pigmentation: The Laurence-Moon-Biedl Syndrome. A. Sorsby, H. Avery and E. A. Cockayne.—p. 51.
Substitution Therapy in Hypopituitarism. A. W. Spence and L. J. Witts.—p. 69.

Insulin Resistance and Diagnosis of Thyroid Disease.—Griffiths describes an abnormality of carbohydrate metabolism in thyroid disease which can be detected even in the absence of any significant increase in the basal metabolic rate. This abnormality takes the form of a diminution in the sensitivity of the muscles to insulin. Thus, whereas in the normal subject the rate at which the muscles withdraw sugar from the blood is greatly increased by insulin, this effect is either diminished or abolished in thyrotoxic and in many nonthyrotoxic cases of goiter. The author bases his remarks on the data obtained from a study of thirty-five cases of thyroid disease. In toxic goiter the peripheral insulin response to the insulin-dextrose test is either poor or negligible, denoting an impairment of the power of the muscles to utilize carbohydrate; this is referred to as peripheral insulin resistance. A similar condition of resistance is found in many cases of nontoxic goiter in which, although the basal metabolic rate is not raised, other signs suggestive of thyroid disturbance, such as intermittent tachycardia, increased fatigability, nervousness and the like, are present. In some cases of goiter, both toxic and nontoxic, central resistance to insulin is present. This condition may be described as an enfeeblement of the normal action of insulin in promoting storage of sugar in the liver. With few exceptions, in both types of cases peripheral insulin resistance is considerably diminished by subtotal thyroidectomy. Central resistance is also in general abolished by thyroidectomy, but again it is occasionally unaffected. The possible relationship between peripheral insulin resistance and myasthenia is stressed. In this connection the creatinuria which is a common feature of thyroid disorders is of particular interest, more especially in view of the association of peripheral insulin resistance, creatinuria and myasthenia in other diseases such as diabetes, acromegaly and dermatomyositis. In view of the frequency with which the author has encountered peripheral insulin resistance in cases in which the nonthyrotoxic or psychoneurotic element of goiter enters, he suggests that estimation of this factor might prove to be a valuable method of detecting possible aberrations of thyroid function in patients who, while not thyrotoxic in the sense that they have a raised metabolism, nevertheless complain of weakness, increased fatigability and symptoms of a cardiac or nervous character.

South African Medical Journal, Cape Town

13: 37-78 (Jan. 28) 1939

- National Health Insurance and an Improved Rural Medical Service. H. Gluckman.—p. 39.
State Medical Insurance in British Columbia. W. Wilson.—p. 41.
A Few Personal Thoughts on General Practice—Past and Present. C. E. L. Burman.—p. 44.
Laryngeal Diphtheria. P. Bayer.—p. 47.
Medical Practice Among Natives. D. D. Dunn.—p. 51.
The Future of Tuberculosis Control: The Papworth Demonstration. N. Mann.—p. 53.
The Transkeian Heart: Tuberculous Pericarditis. J. C. Downes.—p. 55.

Journal de Chirurgie, Paris

53: 305-448 (March) 1939

- Tumors of Internal Theca of Ovary. P. Moulouguet and J. Varangot.—p. 305.
- Abdominoperineal Amputation with Hysterocolpextomy in Cancer of Rectum. J. Charrier and Barraya.—p. 322.
- Connections Between Staphylococic Infections and Avitaminoses. J. Patel.—p. 344.
- Technic of Ablation of Aorticorenal Ganglion. R. Fontaine and F. Bilger.—p. 352.
- *Quincke's Edema of Viscera Simulating Acute Appendicitis. H. Redon.—p. 360.

Quincke's Edema Simulating Acute Appendicitis.—Redon reports the clinical history of a man who had severe pains on the right side of the abdomen. His physician observed that the abdomen was supple; moreover, the patient did not vomit; the temperature was 37.5 C. (99.5 F.) and the pulse was 80. The physician recommended the application of ice and decided to wait twelve hours before making a decision. When Redon saw the patient, the general symptoms were still the same. He rejected the diagnosis of appendicitis and in view of the paroxysmic character of the pains he considered the possibility of an acute invagination and decided to resort to a surgical intervention. On opening the peritoneum he was struck by the extraordinary appearance of the ileocecal region. There was a sparkling edematous mass and Quincke's edema was thought of, the more so since there were no other abnormalities; the appendix in particular presented no sign of inflammation, and the ileum and cecum were likewise normal. However, the appendix was removed and the microscopic examination verified that it was free from anatomic abnormalities. The postoperative recovery was uneventful. The patient was discharged from the clinic on the tenth day. Later investigations confirmed the author's first impression. The patient stated that he was subject to frequent urticarial crises, especially after ingestion of fish, and that before the attack in question he had eaten fish and mussels. Thus the case seems to represent a true attack of Quincke's edema or of "visceral urticaria," as Paul Chevallier proposes to designate the condition. The author regards this case as noteworthy because it proves the existence of a visceral form of Quincke's edema, which, although assumed by some, had not been proved as yet. For surgeons, this case explains certain obscure abdominal symptoms and thus diagnostic errors may be avoided.

Presse Médicale, Paris

47: 281-304 (Feb. 22) 1939

- *Gonadotropic Secretion and Functional Placental Activity: Hormonal Characteristics of Insufficiency, of Normal Condition and of Hyperactivity of Placental Gland. A. Brindeau, H. Hinglais and M. Hinglais.—p. 281.
- Question of Parakeratoses, Dermatoses of Sensitization: Is Psoriasis an Ultravivus Disease? A. Desaux and H. Prétet.—p. 283.

Gonadotropic Secretion.—Brindeau and his co-workers report studies on the quantitative estimation of the gonadotropic secretion. They used successively two methods of titration: first they employed male mice and later rabbits. The latter method is at the same time convenient, rapid and precise and it constitutes in practice a veritable functional test, a method of measurement of the activity of the placental gland. The activity of the placental gland can be insufficient, normal or exaggerated. The authors take up first the secretion of the gonadotropic hormone in nonpregnant women and demonstrate that in healthy, sexually mature women traces of the gonadotropic hormone are found. However, in certain pathologic conditions, such as amenorrhea, cancer of the cervix uteri and lutein cysts or after the menopause, considerable quantities of gonadotropic hormone may be found. In some of these cases 100 or more rabbit units may be detected per liter of urine. Quantities of about 150 units, the authors regard as uncertain in their diagnostic significance, because they overlap into the zone of those values that indicate a dead ovum. In the table, in which the authors list the quantitative values of gonadotropic secretion during gravidic states, they first mention the amounts that indicate placental insufficiency. In cases of placental insufficiency with certain death of the ovum, up to 500 rabbit units of gonadotropic hormone may be detected, whereas values between 500 and 2,000 units indicate weak placental

action but not necessarily death of the ovum. In the presence of normal placental activity between 2,000 and 25,000 units is detected. Values that exceed 25,000 units are indicative of placental hyperactivity. In placental hyperactivity the authors differentiate two groups: 1. Values between 25,000 and 60,000 units are observed in the toxicoses of pregnancy. In hyperemesis gravidarum, for instance, values between 30,000 and 50,000 units have been detected. 2. Values of 60,000 units and higher indicate the presence of hydatidiform mole. The authors show further that gonadotropic titration is an important aid in the early diagnosis of malignant chorionepithelioma. After the evacuation of the hydatidiform mole, the gonadotropic hormone content of the blood should be determined at intervals of about ten days. If the values fall to zero, the woman may be regarded as out of danger. However, if the titer remounts again after temporary decrease, malignant degeneration is certain and operation is necessary.

Arquivo de Patologia, Lisbon

10: 125-380 (Dec.) 1938. Partial Index

- *Cancer of Lung. Nunes d'Almeida.—p. 221.
- Röntgen Therapy in Fibroma of Uterus. Irene Nunes.—p. 351.

Cancer of Lung.—Nunes d'Almeida reports sixteen cases of cancer of the lung. The greatest incidence of the disease was between the ages of 50 and 60 years. All patients but one were men. In the majority the disease developed in the right lung. The author found that the symptoms of cancer of the lung are not precise. Early in the development of the disease the patients are in apparently good health. However, they suffer from repeated hemoptysis, frequently from acute pain in the thorax and shoulder of the side in which cancer developed or from dyspnea. All patients report a progressive thinness and cough during which solid material is eliminated. Axillary and cervical metastases may develop in some cases in the absence of symptoms of diseases of the respiratory tract. The diagnosis is made from microscopic study of the material eliminated while coughing or from material taken by biopsy from grown ganglions and confirmed by x-ray examination of the thorax followed by bronchoscopy in the frontal and lateral postures. Pulmonary cancer may be of bronchial or parenchymal (including lobar) type. Bronchial cancer is the most common and acute form in the group. It develops in the wall of the main or large bronchi, partially (or completely) occludes the lumen of the bronchi, rapidly involves the hilar mediastinal and paravertebral ganglions and the lung parenchyma, and gives early metastases. It shows in the roentgenograms by opacities of the atelectatic lobe or lobes of the lung, and during bronchography by the stopping of the progress of the opaque substance at the occluded zones. Sometimes the tumor is not visible, but the stricture of the visible bronchi indicates the presence of cancer in distant bronchi. The parenchymal forms may be either primary, which are benign, or secondary to bronchial cancer, which are acute. Pure parenchymal forms show in the roentgenograms as isolated tumors at either one or various lobes. An early differential diagnosis between bronchial and parenchymal cancer is important because of the fact that parenchymal forms, especially lobar, are amenable to cure by an early operation (lobectomy or pneumonectomy). The earlier the operation and the better the preoperative and post-operative care of the patients, the better the results. Radium locally applied and roentgen treatments are palliative. They are indicated in early bronchial cancer and in advanced parenchymal cancer.

Brasil-Médico, Rio de Janeiro

52: 89-237 (Jan.) 1939. Partial Index

- *Complement Fixation in Leishmanioses. A. Marques da Cunha and E. Dias.—p. 89.
- Conservative Surgery in Calculous Cholecystitis. P. Cezar de Andrade.—p. 95.
- Cerebral Symptoms in Course of Acute Rheumatic Fever. A. Sampaio Tavares.—p. 97.

Complement Fixation Reaction in Leishmanioses.—Marques da Cunha and Dias state that the complement fixation reaction is not resorted to for the diagnosis of leishmaniosis because there is no proper antigen available for the test. The authors prepared a stable alcoholic antigen from *Leishmania* cultures. They give in detail the technic for the preparation

of the antigen. The authors found that the antigen which they prepared induces (1) strongly positive complement fixation in the blood serum of rabbits which are hyperimmunized with various species of leishmania, (2) positive complement fixation in the blood serum of patients who are suffering from American, visceral and tegumentary leishmaniasis and in animals with experimental leishmaniasis and (3) moderate positive results in the blood serum of patients who have Chagas' disease. A differentiation of the various species of *Leishmania* which cause the various forms of clinical or experimental leishmaniasis cannot be made by the results of the test.

Beiträge zur klinischen Chirurgie, Berlin

169: 1-176 (Jan. 31) 1939. Partial Index

- Lockjaw and Gibbus. R. Löhr.—p. 1.
Diagnosis of Strain as Cause of Fracture of Spinous Process of Vertebra. P. Rostock.—p. 15.
Permanent Result of Two Stage Operation on Biliary Passages. F. Bernhard.—p. 25.
Results with Nicolas Operation for Habitual Dislocation of Shoulder. E. Kreuter.—p. 32.
*Ureteronephrectomy for Renal Tuberculosis. C. van Gelderen.—p. 52.
*Results from Use of Filtered Ultraviolet Rays in Laparotomies. T. Marti.—p. 84.

Ureteronephrectomy for Renal Tuberculosis.—According to van Gelderen there were thirty-nine cases of renal tuberculosis in which ureteronephrectomy was performed at the surgical clinic of the University of Amsterdam between 1919 and 1938. The more extensive operation did not increase either the immediate operative mortality or the mortality of the later course. The ureteral incision healed in almost every instance by primary intention and remained healed. The renal incision presented about the same incidence of wound complications as is seen after a plain nephrectomy. Apparently these complications are not due to the ureter left behind. The removal of the ureter reduces the average duration of wound complications. Empyema of the ureter, cold abscesses and postoperative colics are absent. Even the unfavorable cases do well after ureteronephrectomy. There were three fatalities in this series. The operation presented no disadvantages. The anticipated advantages, however, did not justify themselves completely. The rapid and permanent recovery of the bladder, however, is apparently due to the removal of the ureter. The author recommends this combined operation in all except the early cases of renal tuberculosis.

Filtered Ultraviolet Rays in Laparotomies.—According to Marti, clinical observations on the effect of irradiation with ultraviolet rays in laparotomized patients established the effectiveness of the method in reducing postoperative pain. The therapy, however, was not successful in every case and recourse to analgesics was necessary. Ultraviolet irradiation during the operation had a definite effect in increasing peristalsis during the postoperative period. In various forms of abdominal operations, particularly after an operation for incarcerated hernia, the treatment reduced in some degree the mortality. In cases of diffuse suppurative peritonitis, the results were far from those claimed by Havlicek, who had obtained a 100 per cent cure. The incidence of postoperative thrombosis, embolism and pulmonary complications was reduced. This was particularly striking as far as the occurrence of pulmonary embolism after operation for incarcerated hernia was concerned. The results, however, are far from those claimed by Havlicek. The author feels that the employment of the laparophos lamp in abdominal operations is a valuable therapeutic agent, even though somewhat overrated by its originator.

Medizinische Welt, Berlin

13: 177-212 (Feb. 11) 1939. Partial Index

- Occupational Diseases of Lungs. R. Schoen.—p. 177.
Acute Appearance of Multiple Small Tuberculous Cavities. E. Saupe.—p. 181.
*Genesis and Therapy of Hyperemesis Gravidarum. G. Guhr.—p. 182.
Organization of Blood Donors and Blood Transfusion. K. A. Seggel and H. Reiter.—p. 185.
Quinine in Influenza. E. Pawlowski.—p. 190.

Genesis and Therapy of Hyperemesis Gravidarum.—Regarding the genesis of hyperemesis gravidarum, Guhr says that the theories about it have undergone many changes but that recent advances in the research on hormones and vitamins

have introduced new points of view regarding the pathologic-physiologic processes that are involved in this disorder, and the therapeutic measures that have been based on these new theories have produced considerable success. In order to explain the treatment with vitamin B₁ and a liver extract which is being used successfully at the author's clinic, he reviews the theoretical foundations that correspond to the present insight into the complicated metabolic processes, giving special attention to the hepatic impairment. Following this discussion he reports the results obtained in twelve cases of hyperemesis gravidarum which were treated with vitamin B₁ and a liver preparation. The patients are given intragluteal injections of ampules of liver extract (2.2 cc.) which contain 500 international units of vitamin B₁. At first one ampule of the preparation is injected daily and as soon as improvement is noticeable the injections are given every second day. The total number of injections varies in different cases, but from six to ten are usually sufficient. In especially severe cases more than one injection may be given daily. The diet should be rich in carbohydrates. Discussing the mode of action of the combined administration of vitamin B₁ and liver, the author suggests that it acts as a protective liver therapy, because investigations indicate that a primary hepatic disorder and the involved disturbance in the carbohydrate metabolism are decisive factors in the genesis of hyperemesis gravidarum. Dysfunction of the anterior lobe of the hypophysis is the eliciting cause. Deficiency in vitamin B₁ is not regarded as a causal factor of hyperemesis gravidarum; however, as an adjuvant vitamin B₁ supports the action of the liver extract in that it not only favors an increase in glycogen but also normalizes the disordered carbohydrate metabolism.

Strahlentherapie, Berlin

64: 1-200 (Jan. 25) 1939. Partial Index

- Investigations on Dosimetry of Ultraviolet Rays. U. Henschke and R. Schulze.—p. 14.
Results of Irradiation in Sarcomas: Observations in Zurich from 1919 to 1936. O. Walther.—p. 59.
Preventing Secondary Effects on Urinary Bladder in Ray Therapy of Cancer of Uterus. T. C. Neef and F. Hoff.—p. 113.
Rectal Complications in Patients with Uterine Cancer. F. Gál.—p. 125.
*New Method of Irradiation by Means of Moving Radium Preparations. K. Mayer.—p. 134.
Measurements in Roentgens on Telecurie Therapy Apparatus. A. Gumbert and G. F. Gardini.—p. 149.
Biophysical Foundations of Weak Radium Therapy. B. Rajewsky.—p. 158.

Irradiation by Means of Moving Radium Preparations.

—Mayer points out that irradiation by means of moving x-ray tubes was suggested as early as 1913 by H. Meyer. In spite of the great importance of this technic, it was neglected until in recent years it was revived in the form of rotation therapy by Dessauer, René du Mesnil de Rochemont and others (see also *Strahlentherapie* 60:645, 648, abstracted in THE JOURNAL April 2, 1938, p. 1152). In the present report the author describes his own efforts in adapting the moving principle to radium therapy, pointing out that he experimented with moving radium preparations for the first time in 1926 (report in "Nowiny Lekarskie," page 428) and that in 1933 he discussed the therapeutic application of moving radium preparations. He shows that the irradiation with moving radium involves less technical difficulties than does the employment of the moving principle in roentgen therapy. The small and free radium containers can be coupled easily with a driving mechanism consisting of a clockwork or of an electrical device. It is possible to employ various types of movements. The radium container may be moved in straight lines back and forth, or a rotatory or vibratory method may be employed. The author evaluates the mode of action and the distribution of the radium rays, if the moving technic is employed, pointing out that greater uniformity of ray perfusion of the tissues reduces the danger of relapse in case of tumors. Discussing the devices of application, he says that account must be taken of the available radium supply. This applies especially to the radium containers, not so much to the driving mechanism. The author shows in illustrations that the same motor can be used to produce straight-lined back and forth movements, oscillating arc movements or rotating movements. Regarding the determination of the dosage in the treatment with moving radium preparations, the author refers to studies by René du Mesnil de Rochemont on rotatory roentgen therapy.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 377-476 (Jan. 28) 1939. Partial Index

Surgical Treatment of Pulmonary Tuberculosis. W. Bronkhorst.—p. 378.

*Investigations on Blood Circulation in Drumstick Fingers. W. H. D. De Haas.—p. 384.

Diagnosis and Treatment of Chronic Gonorrhea of Cervix. L. A. Falke.—p. 390.

Measuring of Light Projected Through Coagulating Blood, a Method to Determine Time and Duration of Coagulation. H. Festen.—p. 396.

Circulation in Drumstick Fingers.—De Haas says that many reports about the microscopy of drumstick fingers maintain that there is a strong overfilling of the capillaries. This is of practical significance in that it forms the anatomic basis for the widely accepted opinion that the pathogenesis of drumstick fingers is connected with stasis and cyanosis. However, there are also some investigators who found the capillaries normal or contracted. The author's own investigations aimed at determining possible differences in the brachial circulation of two groups of ten patients with bronchiectasis, in one of which drumstick fingers were present and in the other absent. The studies consisted in capillaroscopy and in the determination of the venous pressure and of the cutaneous temperature. The results of these investigations are recorded in tables. It was found that in drumstick fingers the smallest vessels are not dilated but contracted. The author thinks that this explains some of the peculiarities of drumstick fingers, for instance the localization of this symptom on the extremities that are most exposed to cold, that is, on the fingers rather than on the toes; moreover, the greater incidence in men than in women (in women the capillaries are dilated during menstruation). Regarding the cause of this vasoconstriction the author says that a detailed discussion is impossible in the scope of this article, but he suggests that the vasoconstrictive substances, of which it is known that the organism can produce them, are destroyed in the lungs. In some diseases of the lungs and in congenital heart diseases (among others in bronchiectasis) this filtrating action of the lung fails. The author thinks that it is the impairment, exclusion or overflowing of the pulmonary filter which is of decisive importance for the development of drumstick fingers.

83: 477-616 (Feb. 4) 1939. Partial Index

Treatment of So-Called Neuroses in Children. H. C. Rümke.—p. 483.

*Treatment of Uterine Prolapse in Old Women. F. C. van Tongeren.—p. 493.

Extraction of Cataract in Small Hospitals. G. Wiegersma.—p. 498.

Petrositis. P. G. Gerlings.—p. 504.

Uterine Prolapse in Old Women.—Van Tongeren shows that old women who have a uterine prolapse can often be relieved to a considerable extent by a pessary. Even in case of total prolapse the pessary may be helpful. However, if the treatment with the pessary fails, the operation according to Neugebauer-Le Fort is advisable. After this operation, relapses are less likely than is the case after the operation that has recently been recommended by Kahr. Kahr's operation is even more simple than that of Neugebauer-Le Fort. Kahr too does not counteract the prolapse as such but makes a blockage on the vulva. The author employed Kahr's operation in seven cases but in three of these a relapse resulted. To be sure, all of these women had a total descensus uteri. However, the results obtained with the operation of Neugebauer-Le Fort were more favorable, for of the twenty-five women who were operated on according to this method only three had a relapse and these could now be treated with a pessary, which had not been possible previously. Thus it seems that if relapses do follow the operation of Neugebauer-Le Fort they are usually less serious than those which develop after Kahr's operation.

83: 617-726 (Feb. 11) 1939. Partial Index

Chronic Cystic Mastitis and Carcinoma. S. M. Kropveld.—p. 626.

Treatment of Coxa Vara in Adolescents. C. P. van Nes.—p. 635.

*Amyloid Deposits in Islands of Langerhans in Diabetes Mellitus. C. van Beek.—p. 646.

Amyloid in Islands of Langerhans in Diabetes.—Van Beek was induced to make histologic studies on the islands of Langerhans of patients with diabetes mellitus by the detection of amyloid deposits in the islands of Langerhans of a woman aged 54 who died in diabetic coma. Reviewing the literature he found reports on hyaline degeneration of the islands of Langerhans in diabetic patients, but he questions that these deposits really are hyaline, for reactions in various staining tests indicate

that the substance is amyloid. Studies on the pancreas of fifty-nine patients with diabetes mellitus, whose ages ranged from 5 to 85 years, disclosed amyloid in twenty-five, or 42.3 per cent. In classifying the patients according to age groups it was observed that the amyloid deposits are present only in those over 50 years of age and that with increasing age the incidence of these deposits becomes greater. The author shows that the question whether the amyloid precipitate in the islands of Langerhans is a partial manifestation of a generalized amyloidosis must be answered in the negative. However, the occurrence of occasional amyloid deposits in some pancreatic islands in aged persons, in the absence of clinical signs of diabetes, makes it difficult to decide whether amyloid deposits are the cause or the result of diabetes mellitus. A parallelism with arteriosclerosis, especially of the arterioles, could be demonstrated. The factors leading to the precipitation of amyloid are still unknown.

Ugeskrift for Læger, Copenhagen

101: 115-140 (Jan. 26) 1939

Substances in Phosphate Concrements of Urinary Tract (Chemical-Röntgenographic Study). A. T. Jensen and J. E. Thygesen.—p. 115.

*Vitamin P in Hemorrhagic Nephritis. T. Gimsing.—p. 117.

Thrombopenic Purpura After Treatment with Arspenamine. A. Stigaard.—p. 118.

Harness for Abduction Splints. O. Raagaard.—p. 119.

Vitamin P in Hemorrhagic Nephritis.—Gimsing reports seven cases of hemorrhagic nephritis treated with injections of vitamin P. In no case were there results which could not have been attained as well by rest in bed and diet; in some cases the treatment was without effect, in others it seemed to exert a transitory irritating effect on the kidneys.

101: 141-172 (Feb. 2) 1939

*Family with Hereditary Epidermolysis Bullosa. E. D. Bartels.—p. 141.

Skin Transplantation with Film Bandage. M. Olesen.—p. 144.

Eczema Due to "White Ox-Eye" (*Chrysanthemum Leucanthemum*). P. V. Marcussen.—p. 147.

Hereditary Epidermolysis Bullosa.—Bartels says that in this disorder bullae appear in the parts of the skin exposed to mechanical action, most often on the hands and feet, but also, though rarely in the simple form, on other parts of the body and in the mucous membrane, as in the mouth and throat, and the nails. The content of the blisters is at first clear, later often becoming hemorrhagic. In the simple form the bullae heal completely in from one to two weeks, in the dystrophic form they are followed by more or less marked atrophy of the skin. The disorder as a rule sets in early, often shortly after birth. The prognosis for cure is unfavorable. A tendency to hyperhidrosis is often present; treatment of the hyperhidrosis leads to a not inconsiderable improvement. Of fifty-five members of the family in question twenty-five (eleven men, fourteen women) are known to have epidermolysis bullosa simplex. Transmission seems to be dominant and not connected with the X-chromosome, at least not exclusively. The author believes that ephedrine may be helpful for a definite limited time. The effect of ephedrine apparently supports the theory that there is in these cases a disturbance of the blood vessels or of the nerves and blood vessels.

101: 203-230 (Feb. 16) 1939

*Case of Streptococcal Infection After Injection for Protection Against Diphtheria. T. Madsen and E. J. Henningsen.—p. 203.

Investigations on H. Røtter's Intracutaneous Test in Man for Establishment of Vitamin C. E. Poulsen and H. Lieck.—p. 206.

Tetany in Breast-Fed Child on Basis of Latent Osteitis Fibrosa in Mother: Contribution to Function of Parathyroid Gland. C. Friderichsen.—p. 209.

Blocking and Forming of Nose in Child Aged 4. E. Dujardin.—p. 211.

Electrical "Phantom Heart." G. Rendtorff.—p. 212.

Streptococcal Infection After Diphtheria Immunization.—Madsen and Henningsen review the complications (abscesses and scarlatiniform exanthem) in thirty-four of 2,418 children given injection against diphtheria in January 1933. With one exception all were vaccinated by the same physician at the same time and place. Examination of pus from the abscesses in twenty-three cases revealed a hemolytic streptococcus belonging to group A, type II, in twenty-two cases. Investigation indicated that the anatoxin was contaminated by the assisting nurse, in whose throat and nasal secretion a streptococcus, type II, was established.

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THE MIND OF MAN AND HIS SECURITY

PRESIDENT'S ADDRESS

ROCK SLEYSER, M.D.

WAUWATOSA, WIS.

One by one the great plagues that used to devastate mankind are being overcome. No longer does civilized man live in constant fear of cholera, smallpox and bubonic plague. Typhoid has become so rare that many a modern physician has never seen a case of this disease. Even diphtheria is being brought so certainly under man's control that last year twenty-four cities in the United States did not have a single death from diphtheria. Hardly a decade passes without some new announcement of a phenomenal discovery. In our own time we have seen arsphenamine for syphilis, insulin for diabetes, liver for pernicious anemia, biologic preparations for pneumonia and for scarlet fever, sulfanilamide and sulfapyridine for streptococci and pneumococci and similar infections. We have seen the rise of physical therapy and the growth of a new field called allergy. We have seen life expectancy rise from 40 years at birth to 62 years. What fields remain to be conquered?

Among the problems which yet confront us, mental defect and mental disease are increasingly significant. They are imposing in their scope. An understanding of the human mind and of human thinking may aid in the solution of problems of government.

On any day nearly 1 per cent of all of the people¹ in this country, actually 1,300,000 people, are incapacitated by epilepsy, by feeble-mindedness and by various types of mental illness. The figure is obtained by adding to 550 of every hundred thousand of our population who have nervous and mental disease and who are not in hospitals the total number now being cared for in sanatoriums, hospitals and other institutions. Patients with mental disease occupy 47 per cent of the hospital beds in this country. For the country as a whole, the number of persons hospitalized for mental disease increased more than 40 per cent from 1926 to 1936. The estimated cost of maintenance of these beds is \$230,865,000, with an additional cost of \$18,178,000 for patients under private care. Three hundred Americans enter institutions for mental patients daily for the first time. In addition to hospitalized patients, several millions are more or less incapacitated because of mental illness or disturbances. In such states as

Massachusetts and New York, where hospital facilities are most nearly adequate and where most reliable statistics are available, one out of 150 adults in the present general population is hospitalized because of mental disease. About 1 per cent of the adult population were under care in mental hospitals at some time during the past year. From 5 to 6 per cent of the general population will spend some time in mental hospitals during their lifetime. Including nonhospitalized persons with mental illness, 2 per cent are incapacitated some time of each year. At some time in their lives 10 per cent of the adult general population will be more or less incapacitated by mental illness. Accepting studies made in Massachusetts, fifty-seven of every thousand male infants and fifty-three of every thousand female infants will live to be committed to mental hospitals. It has been estimated that loss of earnings of hospitalized mental patients, plus the cost of maintenance, represents an annual economic loss in this country of \$783,586,000. These figures, bluntly stated, define the scope of our problem. Let us see what hope exists in our attack on it.

CHIEF PROBLEMS IN NERVOUS AND MENTAL DISEASE

Epilepsy, or the falling sickness, has been recognized by the historians from Homer to those of today as the most frightening of human illnesses. The sudden loss of consciousness, the convulsions, the shocking accidents and the dependence associated with this condition make it outstanding as a pressing question. Surely intensified and expanded research on epilepsy is most needed. True, there are available in this country a number of research funds and endowments devoted to the study of this disease. We have learned much about the phenomena associated with it. Every new development in the study of the human body, including most recently the electric encephalograph, has been devoted to a study of this condition; yet our progress has been slight. New remedies for diminishing the threshold of excitation, diets and physical methods of treatment which aid in controlling the number of the attacks and which may diminish to some extent their intensity are announced from time to time. Yet there still remains to be found for this disease, as already is available for some other diseases, a method of control or of treatment that can be included in that magic word "cure," which is the inspiration of every true physician. Perhaps it may be found that there is no one epilepsy and that a variety of convulsive disorders concern us. Such a definition of the problem only enhances its importance.

THE SPASTIC CHILD

Again appealing to the physician for as prompt a solution as possible is the question of the spastic child. These children, who from injury at birth or from other

¹President's address before the American Medical Association at the Ninetieth Annual Session, St. Louis, May 16, 1939.
1. Zubin, Joseph: The Mentally Ill and Mentally Handicapped in Institutions, Pub. Health Rep., supp. 146, 1938, pp. 1-20.

cause develop disability associated with motion of the body and sometimes deterioration of the mental processes as well, command the interest and the pity of all of us. For many of them permanent care in the home or in an institution seems the only answer. The care of these children illustrates how modern medicine, including the knowledge and the work of many specialties, may be brought to bear for prevention and treatment, for reeducation and for complete control. In the prevention of this condition we must study not only the constitution and heredity but all of the toxic changes that may act on the germ cell as it develops within the mother's body. We need the finest control of the art of the obstetrician by whose assistance the child comes into the world. Once the handicap is recognized, the specialist in the care and feeding of children, the orthopedic surgeon, the child psychologist and the psychiatrist must combine in giving their utmost to enable the child to make the most of the functions that it possesses. Perhaps by the very nature of mankind the births of "spastic" children will never be wholly controlled, yet surely the incidence may be reduced to the irreducible minimum and rehabilitation employed to the utmost utilization.

FEEBLEMINDEDNESS

For the control of feeble-mindedness, modern medicine must look to the investigators in genetics and heredity for advice in limiting the production of children incapacitated from birth to meet the mental needs of modern civilization. There is no panacea that we can offer for these fundamental problems of humanity and civilization. Certainly it has not yet been established that modern methods of the prevention of conception in their application to mankind as a whole can control the production of such specimens. Neither is there any evidence that laws regulating sterilization of the parents of the feeble-minded will in any serious manner diminish the total number of feeble-minded. The evidence that is available indicates that at least 10,000,000 people of 130,000,000 in this country bear within their bodies elements which may result occasionally in the production of a feeble-minded child. Our nation is not unique in this regard; indeed, some other nations offer a far greater likelihood of increased mental deficiency. Apparently this is one of those problems of mankind in the mass which nature must eventually solve, as nature has settled many another problem of disease in the past. The laws of biology are more immutable than those of man. The fact that even with the best of education and nurture that we can give the feeble-minded they still tend to die young and thus do not invariably reproduce is an indication of nature's long range technic in keeping multiplication of the unfit under control.

Let me emphasize again that most authorities are agreed that there has been no continuous increase in the number of the feeble-minded, of the mentally defective and of those with mental disease. Such increase as has occurred is the result of the application to these human beings, among all of us, of what modern medicine has done to decrease disease as a whole and thus to prolong life for all of us.

DEMENTIA PARALYTICA

Research in the field of nervous and mental diseases has been particularly concerned in the past ten years with the problem of general paralysis, which the public

calls paresis or softening of the brain and which the scientists call dementia paralytica. What great discoveries have led to possible control of general paresis? Foremost was the determination that the spirochetes of syphilis may invade the human brain and there produce this disease. This discovery, made by a Japanese of German training in an American institution, points again to the universality of medical science. Next came the knowledge that drugs used for the control of syphilis, properly applied, may be of great virtue in impeding the progress of this condition. More recently attention has centered on heat treatment or artificial fever produced by various methods. Now here is a disease of which we know the cause and for which we have certain methods of diagnosis and treatment. Are we ready to say that general paralysis can be completely eliminated? Unfortunately no! A great diminution in the total number of cases of syphilis will bring about a lessened number of cases of this disease. Once established in the brain, however, the spirochete seems inevitably to produce damage to the tissues of the nervous system. The most that treatment can do is apparently to stop the progress of such damage. It cannot restore tissue that has been destroyed and degenerated. Until the time comes when every invasion of the spirochete is recognized and controlled at the earliest possible moment, cases of dementia paralytica will continue to demand medical and institutional attention. Complete elimination of this or of any other disease the dissemination of which depends on intercourse between human beings would require a control of the actions and of the lives of men beyond the power of even the most rigid of governments to establish. Such control would involve changes in our methods of living which are inconceivable under any civilization. Men whose minds and wills are animated temporarily by some single motivation as of religion or nation or race, or who follow blindly after strange gods or strange leaders, may sacrifice freedom of thought and freedom of speech and freedom of action to seek a special goal. But eventually the mind awakens and biology triumphs.

DEMENTIA PRAECOX

Dementia praecox, or the so-called insanity of adolescence, now is responsible for at least 60,000 patients in our institutions and perhaps for another 30,000 persons who are in early or in controlled stages of the disease and not yet hospitalized. Indeed, there are some who insist that there may be far more of these people, including noted statesmen, poets and financiers, outside institutions than within. Manifestations of schizophrenia occur frequently in many hundreds of thousands of so-called normal people. The application of the insulin shock method and of the so-called metrazol shock treatment has given a new stimulus and new inspiration to physicians who are responsible for the care of these patients. Apparently these technics bring about fundamental constitutional changes in the bodies of those who are incapacitated. These changes are reflected in the brain. One of the greatest difficulties of the specialist in nervous and mental disease in the past has been the development of technics whereby treatment applied to the human body as a whole could be made effective on the tissue of the brain. Many authorities are convinced that the application of these new methods will enormously reduce the total number of cases of this type in our institutions. Yet every one who stops solemnly and carefully to consider the

knowledge thus far acquired and published would hesitate to evaluate the total progress that can be made. The diseases with which we are here concerned are diseases of a lifetime. Perhaps it may require a lifetime, or several lifetimes, before the physicians of the future will be able to measure in terms that are scientific what has actually been accomplished by these new technics.

EXPANSION OF THE FIELD OF NERVOUS AND MENTAL DISEASES

People in general, and even most physicians, seldom pause to consider the vast expansion that has occurred in the field of nervous and mental disease. New methods of diagnosis, new research in the pathologic changes that occur in the tissues, the science of the psychologist and the art of the psychoanalyst have broadened tremendously the work of the neuropsychiatrist. Most people know about the diseases that have already been mentioned. To the vast majority such terms as myasthenia gravis, apraxia, polioencephalitis, lenticular degeneration, cataplexy, disseminated sclerosis and myelitis represent words with a hazy or slight significance. The modern nomenclature of conditions affecting the nervous system comprises many hundreds of such terms indicating the intricate detail and multiplicity of signs, symptoms and manifestations with which the modern neurologist and psychiatrist must concern himself.

Increasingly the effects of the mind on the physical functions of the body become apparent. The actions of the heart, the stomach and intestines, the blood vessels and the skin may be intimately and seriously affected by mental processes. Yet this does not signify that relations of mind to body may be lumped into a single category or that closing of the mind to physical manifestations will remove them not only from consciousness but also from existence. It means instead that we must intensify our research into the mechanisms that are involved so that the knowing and understanding mind may be truly the master of the body in which it functions.

THE PSYCHIATRIST LOOKS AT THE FUTURE

Most significant among all the aspects of our civilization is not the increase in the number of the mentally afflicted. This, like many another of the problems with which statesmen and economists concern themselves, is a reflection of just one simple fact for which the sciences of medicine and public health must take the responsibility: Human beings tend to survive, to be more healthful, to live longer than they used to. This explains the fact that more people die now from cancer instead of dying from typhoid and from cholera and from smallpox. It explains why spastic children and the feeble-minded and the epileptic survive instead of being included in the figures for infant mortality. It explains why heart disease and not tuberculosis is now captain of the men of death. It explains why a people who once troubled themselves little with the problems of old age now find the accumulation of economically dependent men and women past 65 and 70 years of age well nigh their chief concern. Man grown old is not efficient; he cannot labor with his body, and his mind is subject to loss of memory, slowness of action and occasionally queer aberrations.

The problem of the individual who is mentally afflicted is, of course, the concern of the individual psychiatrist much more than it is perhaps the concern of the world

as a whole; our world has in these modern days so many concerns which demand its consideration. These concerns arise in most instances not out of individual thinking but out of the psychology of the mass of men, whose opinions are in many instances controlled by stimuli definitely planned to secure a certain result. Perhaps in a day when men were much more accustomed to thinking for themselves and to reasoning from the available knowledge, such influences might not be as effective as they are now. The citizen of the United States in Revolutionary times was a hardy pioneer who had fought the forces of men and of nature successfully and who knew where he wanted to go and what he wanted to do. Today the forces that have been developed by man as a result of modern invention in the field both of materials and of thought are so intricate and so great that frequently they are far beyond the ability of the average man to grasp. Hence bewildered, little men seek constantly for leadership without even sufficient data or background to determine whether or not that leadership is for good or for evil. The breakdown of the sense of individual responsibility is thus a menace not only to the individual but to the nation and to mankind.

Perhaps as a result of the belief of many a man that our civilization has failed, men seek increasingly for security. They wish to be protected against the hazards of unemployment, against the dependence of old age, against the pain and suffering associated with sickness. There has been no lack of self-anointed leaders ready to propose economic and governmental panaceas for meeting the difficulties in the situation. When the Congress of the United States first came to consider social security, the President of the United States warned them against charlatanry in the field of economics. That warning is as important today as it has ever been in the past. It is perhaps more important because of the increased complexity of the situation which confronts us and because of the fact that its long duration has apparently worn away the powers of resistance of many of those who did not at first succumb. But the medical profession, aware of the nature of men and the moral fiber of men, must oppose increasingly those forces which tend to sap vitality, to destroy initiative and to break down individual character. Ethnologists and sociologists know that the life of the race repeats the life of the individual and that the life of the individual repeats the life of the race. They know that nations are but masses of men and that national opinions are the reflections of individual thought. As men become increasingly willing to turn over to their statesmen or to the governments which those statesmen represent the individual responsibilities for which men in the past have fought and died, the vitality of the nation itself must become weakened. The loss of character and of individual initiative may not be pathologic in the sense that mental defect is pathologic. It may not be an illness in the sense that feeble-mindedness is a disease, but its effects on the life of the nation as a whole are as weakening as would be a continued increase in the number of mentally defective among us.

These reflections lead to the inevitable conclusion that it is necessary for physicians and for the nation as well to weigh carefully the extent to which the responsibility of the individual for his own care in times of old age and of disease and of unemployment is to be turned over to the nation. In other words, how

great a price are we prepared to pay for what is called security? If national control over illness is to bring about a breakdown in the character of our people so that they will, like many a foreign nation, be ready to yield supinely to the wills of dictators and of dictator nations, the price will have been far too great. If protection against the hazards of illness and of old age is to include an unwillingness to battle against economic forces which bring about unemployment and national destitution, making the individual citizen ready to accept governmental gratuity on every conceivable occasion, again the price to be paid is far more than the goods are worth.

Today the American people stand before the world as a nation of free men where the processes of individual initiative, freedom of thought, controlled research and independent character have placed us in the very forefront of all the peoples in the world in science, in health, in our scale of living, in recreation and in the ability to enjoy life. It is true, as some of our statesmen have said, that not all the people are possessed of all these advantages, yet taken as a whole the statement is true of the vast majority of our people. By the same forces which have brought us to this high place we should be able to overcome the deficiencies of those who have not yet realized these great advantages and to give to them much of that which is enjoyed by the majority. To this purpose the American medical profession has repeatedly dedicated itself. The solutions of the problems of the nations so far as they concern medical care are the responsibility of the medical profession. That is a responsibility which a free medical profession has never avoided and to which it is at this very time giving its most serious consideration. The responsibility for restoring to this nation an economic status in which more and more independent citizens will be able through their own employment and through the returns coming from that employment to supply themselves with the necessities of life is a responsibility which must rest on the leaders of the nation in industry, in finance and in government. With these leaders also American medicine is ready and willing to cooperate in doing all that can be done to spread more widely the benefits of American life and living.

As President of the American Medical Association for the coming year it is to this task primarily that I propose to devote myself.

Lifeless Reports.—The physicians and surgeons of our great teaching hospitals become more and more dependent on technical experts. How easy, as the problems suggest themselves at the bedside, to accept the view that it is fitting that these highly trained and fully equipped men should undertake the investigation. But the result, so often is that from the first the reach is forced into a narrow channel of technicality from which it fails to emerge, and the work ends in one of those reports which, scientific though they may be in their cold logic, unfold no story, and remain uninspiring and lifeless. The fascination and importance of the problem in its wider and practical implications have been concealed, the inspiration that should drive to its solution has been lost, because the problem is no longer seen in its full perspective, a problem primarily concerning the living, in part concerning the dead, and in part deriving from the laboratory. It is just this integration that is of so much consequence to the vitality of medical research; and this integration is, and always must remain, chiefly within the special province of Clinical Science.—Lewis, Sir Thomas: *Research in Medicine and Other Addresses*, London, H. K. Lewis & Co., Ltd., 1939.

RESECTION OF THE LIVER

CONDITIONS FAVORABLE FOR OPERATION;
METHODS; EXPERIMENTAL STUDIES

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Relatively few resections of the liver have been reported in surgical literature. Several recent textbooks and at least two modern systems of surgery do not even mention the operation. This is probably because so few cases occur in the individual surgeon's experience, no single surgeon having published reports of more than six cases; yet resections of the liver have been done successfully for many years. In the United States Keen¹ reported his first case forty-seven years ago and added his third case and tabulated seventy-six cases from the world literature forty years ago. Bastianelli,² one of the earliest operators, in addition to his original publication forty-three years ago has sent us a personal report of six cases. Garré³ early stated that "no method can be introduced into general surgery unless it can be executed with simple means which every operator has at hand." More than thirty years ago he reported six successful operations in which hemorrhage was controlled by silk ligature of larger vessels and deep constricting catgut sutures. Growths requiring this procedure may confront any abdominal surgeon at any time and a knowledge of the methods that have been successfully used would make possible the saving of many lives. Fifty-nine instances of resection of the liver have been reported to us in correspondence with members and associates of members of the American Surgical Association and with twenty-four cases previously reported by members of the association it is evident that a large proportion of experienced abdominal surgeons encounter one or more hepatic conditions requiring resection at some time during many years of practice. A discussion of certain phases of this subject was given in an earlier paper.⁴ We now repeat important considerations and add a report of experimental studies concerning hemorrhage and shock.

Favorable to safe liver resection are the following facts:

1. The lobes and subdivisions of the liver are supplied by independent arteries, so that one section can be removed without injury to the remaining sections.
2. Anastomoses between blood vessels of different lobes of the liver are free, insuring adequate circulation if a section is cut off from its normal blood supply.
3. Regeneration after removal of liver substance is rapid and quite complete.

The blood supply of the liver has been carefully studied by Martens.⁵ His illustrations show that not only do the right and left lobes have each an independent artery but there are branches supplying smaller subdivisions, lobus quadratus and lobus caudatus. His injection and corrosion specimen also showed that if

Read before the Section on General Surgery of the Pan American Medical Association, Havana, Cuba, Jan. 19, 1937.

1. Keen, W. W.: *Boston M. & S. J.* 126, 1892; *Ann. Surg.* 25: 267, 1899.

2. Bastianelli: *Policlinica (sez. chir.)* 2, 1895.

3. Garré: *Surg., Gynec. & Obst.* 5: 331, 1907.

4. Tinker, M. B.: *Ann. Surg.* 102: 728-741 (Oct.) 1935.

5. Martens: *Arch. f. klin. Chir.* 114: 1001, 1920.

the artery supplying one lobe was injected the free anastomoses would carry the injection to all parts of the uninjected lobe.

Regeneration was experimentally studied many years ago by Ponfick⁶ and also by von Meister.⁶ It was found that four fifths of the livers of rabbits, rats and dogs could be removed without fatal outcome and would grow back to approximately normal after such extensive excision. More recently Fishback⁷ of the Mayo Clinic has carried out similar experiments with the same results. He found that four-fifths regeneration occurred in from six to eight weeks. These experimental results as regards extent of regeneration were confirmed clinically by Wendel,⁸ who found it necessary to do an intestinal resection on a woman whose liver he had resected two years previously.

METHODS OF RESECTION

The most satisfactory exposure of the liver for the average resection is a modified transverse incision slanting slightly toward parallel to the costal border. This is essentially the incision used by Kocher of Bern for surgery of the biliary tract. Study in the dissecting room in Cornell University Medical College, through the courtesy of Drs. Kerr and Papez, showed us that the region under the dome of the diaphragm on the right can be exposed fairly satisfactorily by dividing the eighth, ninth and tenth ribs near the attachment of the costal cartilages. This permits extra upward retraction of from 2 to 4 inches. A vertical extension of the incision upward toward the ensiform cartilage also helps if needed.

The control of hemorrhage has been the problem to which all surgeons have given most attention. McDill⁹ suggested compression of the blood vessels and other structures supplying the liver by compression of the hepatoduodenal ligament with a rubber padded clamp applied in the foramen of Winslow. Kirschner¹⁰ also suggests compression by finger pressure or a rubber covered intestinal clamp; but Ravdin, translator and editor of Kirschner's English edition, adds a note to the effect that such a procedure is accompanied by a profound fall in blood pressure and should be used cautiously. Kirschner also mentions that compression should be restricted to the shortest possible time because the intestine cannot recover if the blood supply is shut off more than a quarter of an hour.

Animal experimentation in the physiologic laboratories at Cornell University to determine the effect of compressing the blood vessels, nerves and ducts in the hepatoduodenal ligament has been possible through the cooperation of Prof. Joseph F. Dye. It showed the fall of blood pressure graphically in several cases by tracings on smoked drums. Rapidity and extent of fall in blood pressure varies with each animal, fifteen minutes being apparently about the maximum time that pressure could be safely continued, considerably less in some cases, since the intestine may become alarmingly blue. The clamping might save life in case of violent, uncontrollable hemorrhage; it could be used for a few minutes until other measures could be applied; it seems unnecessary and undesirable as a routine.

Mattress or chain sutures passed with a blunt needle through the entire thickness of the liver before cutting have been found effective in preventing hemorrhage by a large number of surgeons. If a special needle is not available, as is frequently the case, a large probe with an eye may be used or a long needle with the eye end pushed through first. A blunt needle pushes vessels aside, avoiding injury to larger hepatic vessels. It is important that ligatures should not be pulled too tightly, lest they cut through the friable liver tissue if a great thickness is transfixed, requiring heavy tension. To prevent such cutting, catgut sutures through the liver have been tied over celluloid or magnesium plates, rubber tubing or strips of fascia. A mattress needle, small rod or uterine probe as suggested by Dr. Leonard Freeman¹¹ accomplishes the same result with material which would almost always be available and could be easily removed when it had served its purpose.

Electrosurgery.—Oozing, which is very active from every point of the surface when the liver is cut with a scalpel, was prevented by Keen¹ and others by use of the actual cautery in the days before the introduction of electrosurgery. The radio cutting knife I have found equally efficient for this purpose,² more rapid and far less destructive: also radio cutting was found more satisfactory than the spark gap apparatus. Electrosurgical cutting is recommended by Kirschner¹⁰ and has also been successfully used by surgeons of the University of California Clinic, by Lilienthal,¹² by Kelly and Ward,¹³ by Howard Gray¹⁴ and by others. Removal of a V shape section in resection of smaller tumors is recommended, when possible, by several surgeons as favoring ready approximation of raw surfaces; this not only helps in controlling hemorrhage but favors smooth healing. Covering the wound in the liver by omentum in animals and man has also been found helpful by Boljarski¹⁵ and others.

Autotransfusion.—Great loss of blood from ruptured cavernous hemangioma or from extensive wounds may give rise to profound and sometimes fatal shock. When these growths or injuries are located, as they are most frequently, near the margin of the liver away from the larger bile ducts, there is little admixture of bile with the blood. In our previous paper autotransfusion of such blood was suggested. The possibility of serious results following autotransfusion from toxic choline derivatives or other substances was suggested by Morton.¹⁶ Kirschner¹⁰ suggests that the blood should be tested to determine the absence of agglutination or hemolysis in cases of rupture occurring more than twenty-four hours previously. He suggests collecting the blood by a ladle or suction; also that it may be citrated and immediately returned into a vein by means of a gauze covered funnel. Our experimental studies at Cornell after autotransfusion of an animal's own blood from hemorrhage of the liver do not show evidence of any serious toxic effect: in fact the tracings on the smoked drums showed either no important change in blood pressure or in some animals a rapid and well maintained rise in blood pressure and improvement in the general condition of the animal. Professor Dye states that he has repeatedly injected acetylcholine into the blood stream of animals experimentally without harmful effects.

6. Cited by Ewing, James: *Neoplastic Disease*, ed. 2, Philadelphia, W. B. Saunders Company, 1922, p. 676.

7. Fishback: *Collected Papers of the Mayo Clinic* 21:98, 1929.

8. Wendel: *Arch. f. klin. Chir.* 114:982, 1920.

9. McDill, J. R.: *Ann. Surg.* 56:333, 1912; *Bloodless Surgery of the Liver*, J. A. M. A. 59:1283 (Oct. 5) 1912.

10. Kirschner, Martin: *Operative Surgery* (English edition), Philadelphia, J. B. Lippincott Company, 1933, p. 526.

11. Freeman, Leonard, in discussion on Tinker.⁴

12. Lilienthal, Howard, in discussion on Tinker.⁴

13. Kelly, H. A., and Ward, G. E.: *Electrosurgery*, page 167, Philadelphia, W. B. Saunders Company, 1932, p. 737.

14. Gray, H. K.: *S. Clin. North America* 14:717 (June) 1934.

15. Boljarski, N.: *Arch. f. klin. Chir.* 23:507, 1910.

16. Morton, J. S., in discussion on Tinker.⁴

Resection has been done for the following conditions:

Benign Growths: Hemangioma, echinococcus cysts, gummas, tuberculoma and destructive liver injuries. (Simpler measures are ordinarily available for the last three conditions.)

Malignant Growths: Carcinoma (including adenocarcinoma), sarcoma and hypernephroma.

Cavernous hemangiomas are relatively common tumors of the liver; they are frequently ruptured, giving rise to serious intra-abdominal hemorrhage and, because they are generally thin walled, the bleeding may start spontaneously. Our case, previously reported,¹ belongs in this class of growths. It is important in operating on these patients to excise wide of the growth, as hemorrhage even from a needle prick may be uncontrollable. Packing, actual cautery and even sutures are unavailing unless the stitches are placed in normal liver tissue. This is well shown by the following reports: Gray Turner¹⁷ cites the case of a woman admitted to Guy's Hospital in collapse: a diagnosis of ruptured ectopic pregnancy was made; the abdomen was found to be full of blood; the pelvis was normal; hemorrhage from a hemangioma of the liver could not be controlled by suture or packing; the tumor was removed by cautery and the patient was given an infusion but died after one hour. Severe hemorrhage from a needle prick of a huge angioma of the right lobe is reported by Mantle¹⁸ and quoted by Charles H. Peck.¹⁹ The hemorrhage was uncontrollable by suture or packing and the patient died after two hours. Fatal hemorrhage was also reported by Borst and Chiari²⁰ and by a number of others. The fairly frequent pedunculated hemangiomas are much less difficult and dangerous. Peck¹⁹ reported such a growth involving the entire left lobe, which was removed after the pedicle was clamped and the stump was closed with a continuous catgut suture; the tumor weighed 3 pounds 14 ounces (1,759 Gm.), the largest tumor removed in this country up to the time of this report. Clar²¹ gives details of a successful operation by Schloffer, with a report of thirty others from the literature, an operative mortality slightly over one third of 1 per cent.

Malignant Tumors of the Liver.—As stated in our earlier paper,⁴ many surgeons are pessimistic regarding resection of the liver for malignant growths. This has led others to abandon operation, although the experience of Keen,¹ McArthur²² and Yeomans²³ among Americans and a number of foreign surgeons has shown the possibility of cures up to seven years' duration. Reliable pathologic diagnosis is indispensable. In Keen's¹ case the diagnosis of cylindric cell cancer by Coplin and Tinker was confirmed by William H. Welch and T. M. Prudden; in McArthur's²² case the pathologic diagnosis of adenocarcinoma by Hektoen and Zeit was confirmed by Fenger; in Yeomans's²³ case the pathologic diagnosis of adenocarcinoma by Jefferies of the Philadelphia Polyclinic was confirmed by Ewing.²⁴

Involvement of surrounding organs may offer special difficulties. In McArthur's²² case the liver was involved by extension from cancer of the stomach, so that resection of the stomach as well as of the liver

was required. Wendel⁸ operated for carcinoma of the colon associated with cancer of the liver. Kellogg Speed²⁵ reported extensive involvement of the diaphragm and chest wall requiring resection, together with cancer of the liver. Cullen²⁶ reported nephrectomy for adenocarcinoma with a malignant condition involving the liver; the patient remained well for four years but eventually died of recurrence in the kidney region, the liver being entirely free from recurrence. All these patients recovered from operation and lived for several years.

Primary carcinomas of the liver sometimes seem favorable for operation because of the infrequency of metastases, slow growth and susceptibility to irradiation, as mentioned by McCallum,²⁷ Ewing²⁴ and Sternberg.²⁸ Adenocarcinomas, which are most frequent, respond well to irradiation. Several growths at first reported to be adenoma have later proved malignant, probably adenocarcinoma. In some cases operation has been repeated; in others postmortem examination or clinical symptoms have left no doubt as to the malignant nature of the growth. Sarcoma has been reported by Elliott²⁹ and a few others. Ewing²⁴ believes that there is difficulty in determining the character of the growth in these cases and questions the occurrence of sarcoma, also hypernephroma of the liver.

The unfavorable results following resection for cancer of the liver are based, to a considerable degree, on statistics of operations performed from twenty-five to forty years ago. Moreover Thoele,³⁰ publishing his report in 1913, overlooked two reports by Keen in 1899 in which the patients were living three years after the operation. Improvement in surgical technic and methods during the past twenty years should favorably influence the results in surgery of hepatic cancer. The combination of irradiation and surgery, which has added such remarkable improvement in the results of treatment of cancer of the thyroid, also a glandular organ, should be of help in similar hepatic conditions.

We have not noticed any report of experimental studies such as are described in this paper. Their important bearing in preventing hemorrhage and in preventing and combating postoperative shock seems to warrant the following summary:

RESULTS OF EXPERIMENTS IN LABORATORIES OF PHYSIOLOGY AT CORNELL UNIVERSITY

1. Clamping the hepatic artery and structures in the hepatoduodenal ligaments showed a gradual but at the end of fifteen minutes an extreme fall in blood pressure. Removal of the clamp is followed by a rapid rise in blood pressure to above normal, which is well maintained.

2. A fall in blood pressure occurs when sympathetic nerves are blocked with procaine hydrochloride and also when sympathetic nerves are stripped from the hepatic artery.

3. Autotransfusion of blood from wounds of the liver gives a prompt and well maintained rise in blood pressure and improvement in the animal's general condition. There is no apparent harmful effect from admixture of bile and other associated products with the blood from extensive lacerated wounds.

404 Savings Bank Building.

17. Turner, Gray: Proc. Roy. Soc. Med. (Sect. Surg.) 16:43 (June) 1923.

18. Mantle: Brit. M. J. 1:365, 1903.

19. Peck, C. H.: Surg., Gynec. & Obst. 33:277 (Sept.) 280, 1921; Tr. South. S. & Gynec. A. 33:289, 1921.

20. Borst and Chiari, quoted by Garré: Handbuch der praktischen Chirurgie, ed. 5, Stuttgart, Ferdinand Enke 3:686, 1923.

21. Clar, F.: Med. Klin. 24:1746 (Nov. 9) 1928.

22. McArthur, L. C.: Ann. Surg. 42:626, 1905.

23. Yeomans, F. C.: Primary Carcinoma of the Liver, J. A. M. A. 64:1301 (April 17) 1915.

24. Ewing: Neoplastic Disease, p. 679.

25. Speed, Kellogg: S. Clin. North America 10:213 (April) 1930.

26. Cullen, T. S.: Surg., Gynec. & Obst. 4:573, 1907.

27. McCallum, W. G.: Text-Book of Pathology, ed. 5, Philadelphia, 1932, p. 1116.

28. Sternberg, Carl: Lehrbuch der allgemeinen Pathologie und der pathologische Anatomie, Berlin, F. C. W. Vogel, 1928, p. 499.

29. Elliott: Tr. Am. Surg. A. 1897, p. 257.

30. Thoele: Neue deutsche Chir. 7:1913.

THE ANTIBACTERIAL EFFECTS OF
THE ORGANIC MERCURIAL
COMPOUNDSWITH SPECIAL REFERENCE TO THEIR USE AS
GERMICIDES FOR THE STERILIZATION OF
SURGICAL AND DENTAL INSTRUMENTS,

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A search of the literature has revealed no carefully controlled work showing that any organic mercurial compound can be relied on to kill the spores of an anaerobic bacteria. Nevertheless, claims have been made that these compounds can be depended on for the sterilization of instruments, and vast quantities of them are sold to physicians and dentists for that purpose.

Mercury in its various forms has been used in medicine since the time of the early alchemists, but it remained for Robert Koch¹ to popularize its use as an antiseptic. Immediately after his famous string experiments with anthrax spores the medical world believed that it had in its hands an all powerful germicide which would destroy any disease-producing organism, because apparently Koch had shown that very great dilutions of mercury bichloride would kill the spores of the most resistant organisms. Only a few years after this idea had become thoroughly instilled in the current literature² Geppert³ (1889-1891) with carefully controlled experiments showed that mercury bichloride is a poor germicide although it possesses an almost unbelievable antiseptic or, better, bacteriostatic ability. Mercury bichloride at its best possesses several disadvantages which were known to Koch: It corrodes metal instruments, its apparent killing effect is diminished in the presence of organic matter and it coagulates protein. Furthermore, mercury bichloride cannot be used on the skin over long periods of time without causing dermatitis; it is toxic when injected parenterally and therefore cannot be used in chemotherapy. In spite of these objections and the observations of Geppert and others that mercury bichloride cannot be depended on to kill the spores of anthrax bacilli, it continued to be used because of its great antiseptic action. Chemists throughout the world attempted to produce a mercurial compound which would not have these disadvantages and perhaps might kill the sporulating organisms as well. The first products of these researches possessed few advantages over mercury bichloride, but just at the close of the World War several compounds appeared on the open market in the form of organic mercurials. Some of these were apparently free from the disadvantages of mercury bichloride. With certain types of laboratory tests they seem to be more effective than mercury bichloride. Clinical results indicated that they could be relied on as antiseptics. Many claims were made for them, some rightfully and some without the slightest scientific foundation. Among these claims it

was suggested that certain of the products could be used for the "cold sterilization" of surgical and dental instruments. In fact, several manufacturers placed on the market preparations especially designed for this purpose. Practically all the germicidal claims made for such products were based on phenol coefficient tests in which only *Staphylococcus aureus* and *Eberthella typhi* were used. No adequate tests were made with sporulating organisms such as *Bacillus anthracis*, *Clostridium tetani* or the group of organisms causing gangrene.

Claims for the cold sterilization of instruments and for sporicidal activity found their way into many journals, textbooks and standard references. Even as late as 1937 the Council on Pharmacy and Chemistry of the American Medical Association accepted the claim for one organic mercurial that it is "a potent germicide for the spore-bearing and non-spore-bearing bacteria."⁴ No experiments with organic mercurial compounds have been found in the literature comparable to those of Geppert with mercury bichloride.

That sutures cannot be rendered sterile by the use of mercurial compounds was first brought to my attention in 1937 while making a survey of the sterility of catgut sutures for the Council on Pharmacy and Chemistry.⁵ Bulloch,⁶ Meleney and Chatfield⁷ and later Clock⁸ pointed out that sutures treated with mercurials are not actually sterile but that the mercurials merely exert a bacteriostatic action on the organisms present. In making this survey for the Council I obtained some sutures which were more than 10 years old. These sutures were "sterilized" by a mercury method and were suspended in 1:1,000 potassium mercuric iodide tubing fluid. When sterility tests were made on them, twelve of the fifty-two sutures were found to contain viable spores, seven of which were of anaerobic bacteria. These results led me to question the advisability of using mercurial compounds for sterilization of instruments, especially after learning that no carefully controlled work had been done in which anaerobic spores were used as the test organism.

DEFINITION OF TERMS DESCRIBING ANTIBACTERIAL
ACTION OF THE MERCURIALS

In order to have no misunderstanding regarding the terms used throughout this work, certain words commonly used to describe the antibacterial action of the mercurials are defined.

The present uses of the terms sterile and sterilization are given in a report of the Council on Pharmacy and Chemistry:⁹ "The Council on Pharmacy and Chemistry has formally gone on record as disapproving of the use of the terms "sterile," "sterilize" and "sterilization" in a bacteriologic sense other than in their correct scientific significance; i. e., meaning the absence or destruction of all micro-organisms. These terms are not relative and to permit their use in a relative sense not only is incorrect but opens the way to abuse and misunderstanding."

4. Merthiolate, New and Nonofficial Remedies, Chicago, American Medical Association, 1937, p. 293.

5. Brewer, J. H.: The Present Status of the Sterility of Catgut Sutures on the American Market, *J. A. M. A.* 108:722-727 (Feb. 27) 1937.

6. Bulloch, William: The Disinfection and Preparation of Catgut for Surgical Purposes, British Medical Research Council Special Report Series, No. 138, 1929, part 1, p. 7.

7. Meleney, F. L., and Chatfield, Mabel: The Sterility of Catgut in Relation to Hospital Infections, *Surg., Gynec. & Obst.* 52:430 (Feb., No. 2A) 1931.

8. Clock, R. O.: The Fallacy of Chemical Sterilization of Surgical Catgut Sutures, *Surg., Gynec. & Obst.* 56:149-161 (Feb.) 1933.

9. Report of the Council on Pharmacy and Chemistry: Use of the Terms "Sterile," "Sterilize" and "Sterilization," *J. A. M. A.* 107:38 (July 4) 1936.

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Dr. J. Howard Brown helped the author in planning this work and gave almost daily guidance and valuable criticism; Dr. Warfield M. Firor gave assistance and suggestions relative to the surgical problems involved, and Drs. Lloyd Felton and Paul N. Leech gave helpful criticism. Miss Elizabeth King gave technical assistance. Various commercial firms supplied the mercurials tested.

1. Koch, Robert: Zur Untersuchung von pathogenen Organismen, *Mitt. a. d. k. Gsndtsamte.* 1:1, 1881.

2. Flügge, C.: Mikroorganismen, Leipzig, F. C. W. Vogel, 1886, pp. 542-545.

3. Geppert, J.: Zur Lehre von den Antiseptics, *Berl. klin. Wchnschr.* 26:789, 819, 1889.

The word antiseptic, around which much confusion has arisen in the past, should convey only one meaning: that which is carried in the word itself—the preventing of sepsis or putrefaction.

Regarding the words germicide and geruicidal, there has been little difference of opinion among workers. The terms refer to anything that kills germs (micro-organisms).

The words bactericide and bactericidal convey the same meaning as germicide, except that they apply to bacteria only.

The word disinfectant is commonly used to refer to substances used on inanimate objects. The meaning, as the word implies, is to render noninfectious. A disinfectant may be either an antiseptic or a germicide; that is, it may either prevent infection by preventing development of the organisms or destroy them outright.

Bacteriostatic or bacteriostasis refers to an agent or state which prevents the development of the organisms. An antiseptic which does not kill may be a bacteriostatic agent.

For a more detailed discussion of the true value of these words one is referred to Patterson's¹⁰ "Meaning of Antiseptic, Disinfectant and Related Words." I am in thorough agreement with him that if one adheres to the strict denotation of these terms there will be no serious confusion among the laity or professional men.

Much confusion in medical literature has arisen because certain fundamental principles have not been taken into consideration. This is especially true concerning mercurial antiseptics or disinfectants. For instance, mercury bichloride, as Abbott¹¹ has pointed out, is capable, in strong concentration, of killing *Staphylococcus aureus*, while in very dilute solutions it is only bacteriostatic. Thus a compound may be antiseptic in concentrations too weak to be germicidal. Not only must the concentration of the active agent be considered but the following factors must also be considered in choosing the proper term to describe a particular action: the time of contact, chemical nature of the surrounding medium, the reaction (pH), temperature, number of organisms present in proportion to the amount of chemical agent, the nature of the organism and the purpose for which the chemical is used.

PRELIMINARY EXPERIMENTS TO SHOW TO WHAT EXTENT ANAEROBES ARE ACTUALLY PRESENT ON INSTRUMENTS AFTER OPERATIONS

As a result of a review of the literature¹² it was decided to determine to what extent anaerobes were actually present on blades after operations. Arrangements were made with the Department of Surgery of the Johns Hopkins Hospital to secure blades used in a series of operations. The nurse in charge of operations had an attendant drop the blades into a sterile tube as the surgeon discarded them. Aseptic precautions were observed and there was very little chance of contamination. The blades from 120 operations were examined and 12 per cent were found to be contami-

nated with anaerobic spore-forming bacteria. Had these blades been "sterilized" by some inefficient chemical means and reused, there would have been the possibility of infecting other patients. Eight per cent of the contaminated blades were those used for incision of the skin, and this closely parallels the observations of Roberts, Johnson and Bruckner,¹³ who found 8.5 per cent of the knives used for making the cutaneous incision to be contaminated with *Clostridium welchii*. These observations, together with the reports of infections in the literature, seem to indicate that the spore-forming anaerobes should also be used in determining whether a chemical agent is suitable for disinfecting instruments. For the experiments to follow it was decided that pathogenic anaerobes should be chosen on the basis of their mode of attack on the body and the frequency with which they occur in nature. *Clostridium tetani*, *Clostridium septicum* and *Clostridium welchii* were chosen. *Clostridium tetani* remains localized in the tissues and kills entirely by virtue of its toxin. *Clostridium welchii* and *Clostridium septicum* invade the tissues. *Clostridium septicum* may be found in large numbers in the pericardial and peritoneal cavities after fatal infection, and these infections are always characterized by dark red muscles and edema. In infections caused by *Clostridium welchii* the muscles are pale and spongy as the result of gas formation. An important characteristic of the clostridia which is not often appreciated is that all the pathogenic members are able to form spores in the animal body (Topley and Wilson,¹⁴ p. 672).

In order to check the technic used and to make the experiments comparable to those of other workers, several different kinds of bacteria have been used as controls. In certain instances *Bacillus anthracis* (a spore-forming aerobe), *Staphylococcus aureus*, *Corynebacterium diphtheriae*, *Escherichia coli* and *Eberthella typhi* were used. These include representatives of both the gram-positive and the gram-negative nonsporulating bacteria.

INTRODUCTION TO METHODS USED FOR TESTING THE MERCURIALS FOR THE STERILIZATION OF INSTRUMENTS

The opinion regarding the evaluation of disinfectants is divided into two more or less distinct groups: those who would place every confidence in the results of some laboratory tests and those who accept only clinical data; that is, whether the agent actually works in practice. A far greater number of physicians fall into the latter class and there is much to be said in favor of such an opinion. Garrod (1935) has well stated: "It is customary to deride laboratory conditions as [being] too far removed from those of practice to afford significant results; the truth is that practical conditions can be imitated closely and in almost every particular. The virtue of a test may in fact be held to depend largely on how far it achieves this, and the whole art of devising it consists in securing the necessary conditions without sacrifice of uniformity."

If one attempts to evaluate chemical agents for use on the skin or mucous membrane, to act as either antiseptics or disinfectants, many factors at once present themselves which tend to make it impossible to reproduce actual uniform conditions. Among these factors

10. Patterson, A. M.: Meaning of "Antiseptic," "Disinfectant" and Related Words, *Am. J. Pub. Health* 22: 465 (May) 1932.

11. Abbott, A. C.: Corrosive Sublimate as a Disinfectant Against the *Staphylococcus Pyogenes Aureus*, *Bull. Johns Hopkins Hosp.* 2: 50, 1891.

12. At this point, owing to lack of space, a section has been omitted containing a review of the literature concerning theories of the mechanism of killing by the mercurials, previous work on the antibacterial activity of mercurials and methods of testing their bactericidal action for the sterilization of instruments. A short review of the literature relative to the instances of anaerobic infection traceable directly to faulty sterilization of instruments is also included. These sections may be obtained from the author in a special reprint, together with a supplementary bibliography.

13. Roberts, Kingsley; Johnson, W. W., and Bruckner, Helen S.: The Aseptic Peritoneal Cavity—A Misnomer, *Surg., Gynec. & Obst.* 57: 752 (Dec.) 1933.

14. Topley, W. W. C., and Wilson, G. S.: *The Principles of Bacteriology and Immunity*, ed. 2, Baltimore, William Wood & Co., 1936.

tissue permeability, individual variation in the animals, including resistance, drug sensitiveness and many other variants, become apparent if one attempts such tests. In testing these chemical agents for the sterilization of instruments, however, there is no reason why the actual conditions cannot be reproduced to the finest detail. The procedure is an entirely *in vitro* one with none of the variable elements of *in vivo* tests entering in. Since this is true there is no reason why the standard method for testing such chemicals should be based on any type of test other than one which exactly reproduces the condition under which the chemical is to be used.

In order to make the proper approach to the problem, it was thought wise to secure some reliable information concerning the actual use of these mercurials in the "cold sterilization" of instruments. Since the larger part of the surgery done by physicians is carried out in hospitals where steam sterilization is accessible, chemical solutions are not used to the extent that they are in the dental field, where very little surgery is done in hospitals. Practically every dental surgeon must provide for the sterilization of his own instruments.

DENTAL QUESTIONNAIRE TO DETERMINE ACTUAL CONDITIONS OF USE OF THE MERCURIALS

Before attempting a study of the antibacterial effects of the organic mercurials used for disinfection of instruments it was necessary to know to what extent these substances were used, the treatment of the instruments before and after attempting sterilization and how long they were left in the solution before being considered safe for use. With the aid of the secretary of the Council on Dental Therapeutics of the American Dental Association, a questionnaire was prepared and sent to all class A and B dental schools in this country and the following dental clinics: Mayo Clinic, Section on Dental Surgery, Rochester, Minn.; University of Chicago, Zeller Foundation Clinic, Chicago; the Forsyth Dental Infirmary for Children, Boston, and the Murray and Leonie Guggenheim Dental Clinic, New York.

In addition, the questionnaire was sent to a representative group of individual dentists over the country, some with very large practices and others with comparatively few patients. Although only sixty-five questionnaires were sent out, the answers represent a cross section of dental practices, since all of the dental schools are included.

Much thought was given to framing the questions in order that they might be clearly understood and so that the answers might be comparable. In view of the definitions given earlier in this paper, some question arose as to the proper word to be used in connection with the treatment of the instruments. Disinfection more adequately describes the actual accomplishment in most cases, but at the time this questionnaire was circulated practically all the commercial solutions carried the phrase "for the sterilization of instruments." A large number of the publications on the subject deal with the chemical sterilization, or chemical agents used for the sterilization, of instruments. Seventy-one per cent of the dentists advocated the use of chemical agents for the sterilization of some instruments. These were usually cutting instruments, scalpels, nerve broaches, tissue shears or instruments made of rubber or other material which would be damaged by boiling.

Sixty-three per cent of those making use of some chemical agent for sterilization use a mercurial.

Metaphen, potassium mercuric iodide, merax, mer-cresin, mercaboliolide and merthiolate were the mercurials used. Almost 50 per cent of those using a mercurial used metaphen germicidal solution (1:2,500).

Two of the factors known to influence the chemical disinfection of instruments are the preliminary treatment the instruments receive and the length of time they are allowed to remain in the solution. According to the replies, the time elapsing after the instrument was used until it was placed in the solution ranged from immediately after use to twenty-four hours or until the instrument was needed. The object of this question was to determine whether enough time elapsed for the blood and saliva to dry. In those instances the instruments would be much more difficult to disinfect. Practically all of those suggesting the use of any chemical agent thought it advisable to wash the instruments before placing them in the chemical solution. Several scrubbed with a brush or other scrubbing agent and a few used scrubbing with soap.

There was a great variation in the length of time the instruments were left in the solution, the time varying from one minute to four hours. Almost every minute up to thirty was suggested as the minimum before the instruments were considered safe to use. Sixty per cent of those answering this question considered a period between ten and thirty minutes as the minimum time for sterilization. At the completion of the sterilization 45 per cent suggested drying on a sterile towel and placing in cabinets before use. The other treatments suggested were rinses in various sterile solutions, saline solutions, boric acid, distilled water or alcohol and drying in air.

Regardless of the value of a questionnaire as a means of obtaining reliable information, this one served to furnish the names of the mercurials actually being used, fixed the maximum and minimum time limits and stated the condition of the instruments when placed in the solutions. This information was necessary in designing experiments to simulate actual conditions of use.

MERCURIALS USED IN THE EXPERIMENTAL WORK

The list of mercurials to be used in the experimental work was made up of all those mercurials named in the answers to the dental questionnaire together with those mentioned as agents which might be used as antiseptics or disinfectants in the 1937 edition of *New and Non-official Remedies*. Included are a few new ones which have not been submitted to the Council on Pharmacy and Chemistry or at least have not been accepted at the present date. Some of the mercurials, owing to their dye content or for other reasons, are not suitable for use on instruments and are not promoted for such purposes but have been included because they represent different types of the organic mercurial compounds. Several inorganic compounds have been included to act as controls and some because they are still being employed to a large extent for the disinfection of instruments.

The mercurials used are shown in table 1. The information in this table has been derived from various sources: manufacturers, publications and in some instances consulting chemists. The material will be of value to those unfamiliar with the trade names and to persons wishing to make chemical comparisons.

The chemicals for the most part were secured from the secretary of the Council on Pharmacy and Chem-

istry. In some cases the products were secured directly from the manufacturer and in others they were purchased on the open market.

Since it is not my purpose in this work to compare the efficiency of the various preparations except as to whether they are capable of accomplishing complete sterilization, no attempt has been made to keep the dilutions of the different mercurials constant. The rule generally followed was to use the dilution suggested for the sterilization of instruments or, if the product was not advocated for this purpose, the dilution used was that mentioned for disinfecting the skin or wounds.

In the case of the proprietary mercurials, the solutions were obtained in original packages, since in several instances other chemicals were incorporated to keep the mercurial in solution, to aid in penetration or to prevent rusting of the instruments. In certain instances they are obtainable only in solution form. The nonproprietary chemicals were made up in accordance with suggested directions for use. With some of these it was necessary to make fresh solutions often; with others, large amounts could be made up and kept in glass stoppered bottles in the dark. In every case more than one lot was tested with each organism.

Although it has been shown by Moll,¹⁵ Joachimoglu¹⁶ and others that the reaction (p_{H}) greatly affects the bactericidal action of the mercurials on spores, no attempt has been made in the experimental work to adjust the p_{H} . The stock solutions were used as they came from the manufacturer, since it was desired to test the solutions as obtainable by the physician. It was assumed that the solutions on the market would be of the optimal p_{H} for the maximum killing effect. In the few cases in which I made the solutions, unbuffered distilled water was used. The p_{H} of the various solutions was found to be between 3.5 and 10.5, and stock solutions of the different mercurials varied little from lot to lot.

EXPERIMENTAL

Method Used to Obtain Spores for the Experimental Work.—Before I began the actual experiments it was necessary for me to have spore suspensions of the various anaerobes in pure culture. One serious source of error in testing disinfectants with spore-forming organisms has been that the method of cultivation before the test has not been conducive to spore formation, with the result that the tests have simply been made on vegetative forms which were no more resistant than staphylococci or other vegetative organisms. An interesting example of this has been found in securing information on the organic mercurials from the manufacturers. A letter was sent to each of the manufacturers of mercurials asking for information on their product, with special regard to its efficiency as an agent for sterilizing instruments. One of the manufacturers in answer wrote a letter including protocols of experiments showing that its particular product was very effective for killing *Clostridium welchii*. The exact words were “. . . is very effective for the sterilization of instruments. This statement is based on experiments which showed that surgical instruments contaminated with blood and three representative organisms such as *Staph. aureus*, *B. coli* and the spore-bearing *B. welchii* were sterilized in 5 minutes or less.”

On close examination of the protocols it was suspected that the organisms had been grown in beef infusion broth containing dextrose in order to get a heavy suspension for the test. *Clostridium welchii* does not form spores in the presence of this carbohydrate.¹⁷ For confirmation, a culture of the strain used was obtained from the company and cultural tests showed no spores to be formed in the medium as used by the manufacturer. Thus it was necessary before the experiments were attempted to have a method of cultivation for each of the anaerobes used to insure adequate spore formation.¹⁷

Experiments with Dental Burs.—As a result of the information obtained in the dental questionnaire, the following experiments were made. They follow in every detail the methods used by the physician or dentist in “sterilizing” his instruments. These experiments were made to determine whether or not the mercurials under actual conditions of use were capable of sterilizing the instruments when spores of some of the pathogenic anaerobes were used as the test organism. I do not claim originality for this type of test. Practically every hospital in which infection has occurred and the instruments were suspected has called on its bacteriologic laboratory to make just such tests as these. The one object in this work has been to conduct the tests so that in case the organisms had not been killed they would have had the proper conditions for growth.

For the first series of experiments dental burs¹⁸ were sterilized in a Petri dish in the hot air oven. These burs were removed with aseptic precautions and the serrated cutting edges dipped in defibrinated blood to which had been added spores of one of the test organisms. The burs were then placed upright in holes in a rack made to fit inside a Petri dish. The burs were covered by inverting a Spray dish over them. This whole assembly had previously been sterilized in the hot air oven. The transfer and dipping of the burs were accomplished with the aid of a pair of forceps previously sterilized and flamed between transfers.¹⁹ The contaminated burs then represented the contaminated instruments as they came from a patient's mouth, provided there had been loss of blood and the contaminating organism had been present. The burs in the inverted Spray dish were left at room temperature for varying lengths of time before being placed in the chemical disinfectant. One set was washed immediately (five minutes) after being contaminated and placed in the disinfectant. Sets of burs, that is, one for each organism, were placed in the disinfectant after fifteen minutes, thirty minutes, one hour, four hours and twenty-four hours. This was to determine whether or not it made any difference at what time after use the instruments were placed in the disinfectant. It was thought that the drying of the blood might make mechanical cleansing more difficult and thus affect the sterilization.

Since most of the dentists thought it advisable to wash the instruments and some even to scrub with a brush before placing them in the “germicidal” solution, it was decided to vary this procedure. Some sets of instruments were not rinsed at all, others were rinsed

15. Moll, T.: Untersuchungen über die Wirksamkeit einiger chemischer Desinfektionsmittel. *Centralbl. f. Bakt.* 54: 416, 1920.
16. Joachimoglu. *Der Wasserstoffionenkonzentrations auf die*.
134: 489-492, 1923.

17. The technic for obtaining spore suspensions of the several organisms is given in the special reprint.

18. Dental burs for this work were furnished by the Ransom and Randolph Company, Toledo, Ohio.

19. Hill, H. B.: Sterilizing Instruments During Bacteriological Autopsy Work, *J. Applied Micro.* 3: 964, 1900.

in sterile tap water and still others were scrubbed until apparently clean with a sterile brush and water.

Although the answers to the questionnaire placed the time for sterilization in the chemical solutions from one minute to four hours, it was decided to use as the minimum time ten minutes. This was the minimum time suggested by some of the manufacturers for the sterilization of instruments. In addition, sets of contaminated burs were allowed to remain in the various

solution of potassium mercuric iodide (Parke-Davis germicidal disks). This work was done in 1936, and these were the mercurials which were being or had been used for sterilization of instruments by dentists and dental clinics in Baltimore.

Although this work with dental burs represents seven months of experimental work and sixty complete experiments, a tabulation of the results would be of little value, for in each instance growth was obtained

TABLE 1—*Mercurials Used in the Experimental Work*

Name	Manufacturer	Chemical Name	Mercury Content	Structural Formula*	Empirical Formula	Type	Comment	Concentration of Type Used
Merthiolate	Ell Lilly & Co	Sodium salt of ethyl mercaptothiosalicylic acid	49%	C_2H_5HgS	$C_8H_9O_2S Hg Na$	$R_1Hg S R_2$	Where R_1 and R_2 are different organic radicals	1:1,000 isotonic solution
Metaphen	Abbott Laboratories	Anhydride of 4,6-dihydroxymercuri ortho cresol	56.57%	sodium salt used	$C_7H_2O_4Hg N$	$R Hg X$	.	1:2,500 aqueous germicidal solution
Merphenyl nitrate	The Hamilton Laboratories	Phenyl mercuric nitrate (basic)	63%		$C_6H_5HgOH, C_6H_5HgNO_3$	$R Hg X$	Where R is an organic and X is an inorganic radical	1:1,500 boric acid solution
Mercurbiodide	The Upjohn Co.	Ortho hydroxy phenyl mercury biiodide	60.95%		$C_6H_5O HgCl$	$R Hg X$	.	1:1,000 aqueous solution
Mercrelin	The Upjohn Co.	Not a chemical entity	.	A mixture of mercurbiodide and five isomeric amyl ortho cresols	C_6H_5-OH, C_6H_{11}	.	.	Tincture (only form available)
Mertosol	McKesson & Robbins, Inc	Acetoxy mercuri 2 ethyl hexyl phenol sulfonic acid	40%	CH_3COOHg	$C_{10}H_{14}O_6S Hg$	$R_1Hg O R_2$	.	1:1,600 isotonic solution
Merurochrome	Hynson, Westcott & Dunning	Sodium salt of di brom hydroxymercuri fluorescein	24.26%		$C_{10}H_4O_6Br_2HgNa_2$	$R_1Hg X$	...	1:50 aqueous solution
Meroxyl	Hynson, Westcott & Dunning	Sodium salt of 2,4 di hydroxy-3,5 di hydroxymercuri benzo phenone 2' sulfonic acid	26.29%		$C_{13}H_9O_6Hg_2SNa$	$\begin{matrix} -HgX \\ R_1 \\ -HgX \end{matrix}$	.	1:200 stabilized aqueous
Mercury oxyanide	Nonproprietary	.	83.5%	.	$Hg(CN)_2 HgO$	Inorganic	A basic mercuric salt of hydrocyanic acid	1:6,000 aqueous
Mercuric cyanide	Nonproprietary	.	83.3%	.	$Hg(CN)_2$	Inorganic		1:1,000 aqueous
Potassium mercuric iodide	Nonproprietary	.	25.5%	.	$K_2Hg I_4$	Inorganic	A complex salt formed from 1 mole of HgI_2 and 2 moles of KI	1:1,000 aqueous
Mercury chloride	Nonproprietary	Mercuric chloride, "corrosive sublimate"	83.3%	.	$HgCl_2$	Inorganic	.	1:1,000 aqueous

* The positions of some of the groups are doubtful. For source of information see text.

mercurials for periods of thirty minutes, one hour and twenty-four hours. Immediately after being removed from the sterilizing solutions the burs were placed in 40 cc. of 1 per cent sodium thiosulfate for twenty-four hours to neutralize any of the mercurial which might be present, as suggested by Meloney and Chatfield.⁷ The burs were removed from this neutralizer, washed in 40 cc. of distilled water and transferred to infusion broth (40 cc.). They were then incubated in an anaerobe jar and removed when growth was noted. In instances in which growth was found, the organisms were identified to make sure that they were the same with which the bur had originally been contaminated.

The mercurials used were merthiolate 1:1,000, metaphen germicidal solution, mer cresin and a 1:5,000

even after twenty-four hours' exposure to the disinfectant when the spores of any of the following organisms were used: *Clostridium sporogenes*, *Clostridium* septique, *Clostridium tetani*, *Clostridium welchii* and *Bacillus anthracis*.

The technic in these sixty experiments was varied so that some of the experiments simulated every possible combination suggested or actually used by the dentists.

The mixture of the organisms with blood approaches conditions which would be encountered in surgical practice.

Since in dental practice the instruments are not exposed to sodium thiosulfate, it was decided to repeat some of the experiments and omit this treatment.

The burs were rinsed in distilled water after remaining in the mercurials for one hour and for twenty-four hours respectively. They were placed in broth, and growth of the test organisms was obtained in every instance. Mead²⁰ found metaphen incapable of killing *Bacillus anthracis* and *Bacillus subtilis* spores in one hour. He failed, however, to obtain growth after one and one-half hours. His method was to inoculate agar plates from the instruments after rinsing off the excess germicide. He incubated his cultures only forty-eight hours before making readings. Burke, Sprague and Barnes²¹ have shown that this incubation period is not sufficient. Meleney and Chatfield⁷ have shown that organisms which have been treated with a disinfectant often do not grow out until the fifteenth day, with a maximum number growing out on the thirteenth day.

It is also to be expected that the practice of placing the instrument in the broth would yield a much higher percentage of positive results than that of simply dipping the instruments into melted agar. In actual practice the instruments might be forced into the tissues, and particles in crevices of the instrument would be removed which might not be dislodged by a simple dipping into agar.

EXPERIMENTS WITH DETACHABLE SURGICAL BLADES²²

Dental burs with deep grooves and serrated edges were chosen because they presented lodging places for bacteria such as would also be found in joints of hinged instruments. This would make mechanical cleansing more difficult and would tax the germicide to a greater extent. The choice of these rough burs gave no idea what the value of such solutions might be in the case of smooth instruments such as scalpels. For this work detachable surgical blades were used. New blades from which the grease had been removed and those from which it had not been removed were used. These blades were used because they could be submerged in the medium and incubated for the duration of the test. The experiments with these instruments were made along with the dental burs, and in no instance were the results different. That is, growth was obtained in every instance. The conditions of testing and the mercurials used were the same as for the dental burs.

Two possible sources of error in this type of test are to be noted. In these experiments the contaminating blood mixture had been made with defibrinated blood. The contaminating mixture should have been made with whole blood, for the bacteria would then have been entangled in the fibrin and might have been more difficult to remove from the instruments. In actual practice the surgeons' blades are affixed in the handle and many crevices are formed which fill with pus, blood and exudate of various kinds, and, if actual conditions were to be approached, the blades should have been affixed to handles. Since positive results were obtained with the smooth blades and defibrinated blood, these factors are minimized; but had the organisms been killed in any instance these would have been very important factors and should be borne in mind in experiments of this type.

After studying the results of the experiments with burs and detachable blades it was realized that, although

the experiments reproduced in detail the methods actually employed in chemically "sterilizing" instruments, certain bacteriologic technic was not above criticism for reasons to be described later, and perhaps a true picture of the ability of the mercurial disinfectants had not been obtained. The technic of a group of experiments was outlined so that the action of the mercurials on the spores of several organisms could be tested. These experiments were designed to determine the action of the mercurials not on spores entrapped in blood or dried in films in crevices surrounded by protein but naked spores in a large excess of the mercurial. The greatest attention was paid to bacteriologic technic, so that ideal conditions for killing and no chance of accidental contamination would exist.

DEVELOPMENT OF AN EFFICIENT CENTRIFUGE TECHNIC FOR TESTING MERCURIALS

Are the organic mercurials, under ideal conditions, capable of killing or rendering nonviable the spores of anaerobes? With this question in mind the following experimental work was undertaken. The technic was improved from time to time and these improvements are noted in the text.

Ditthorn and Bartel²³ described what they term a more exact method for evaluating disinfectants. *Staphylococcus aureus* was the only organism tested by these workers, and although *Chemical Abstracts* in reporting this work makes the statement that the authors used the method for "determining the value of the disinfectant in killing spore suspensions," no mention of any sporulating organism could be found in the original publication.

My first experiments using a centrifuge technic were made before I became familiar with the previously mentioned work of Ditthorn and Bartel, but the method used differed in only a few respects. Cultures of *Clostridium sporogenes*, *Clostridium tetani*, *Clostridium welchii* and *Bacillus anthracis* were grown on agar by previously described methods which insured spore formation. The spores were washed twice with distilled water, which left only a small sediment of bacteria on the bottom of a 15 cc. centrifuge tube. This washing was done to get rid of any toxin and soluble organic matter that might have been present. The tubes containing the spores were filled to the 15 cc. mark and, by means of a very fine capillary pipet, the organisms were mixed with the disinfectant. Metaphen germicidal solution and merthiolate were the only mercurials used in these preliminary experiments. The mercurial spore suspension was allowed to stand for fifty minutes and centrifuged ten minutes (one hour total). The disinfectant was decanted and the treated organisms were washed twice. The anaerobic organisms were transferred to cooked meat medium under petrolatum by a technic described by Brown²⁴ for preventing the organisms from becoming covered with petrolatum and thus preventing growth. The spores of *Bacillus anthracis* that had been treated by this method were streaked out on agar and planted into serum broth as suggested by Süpfle and Degeler²⁵ in order to insure growth of anthrax spores which had been treated with

20. Mead, S. V.: Sterilization for Surgery of the Mouth, *Internat. J. Orthodontia* 16: 1097 (Oct.), 1215 (Nov.), 1317 (Dec.) 1930.

21. Burke, V.; Sprague, A., and Barnes, L.: Dormancy in Bacteria, *J. Infect. Dis.* 36: 555-560 (June) 1925.

22. These blades were furnished for this work by the Surgical Blade Division of the American Safety Razor Corporation, Brooklyn.

23. Ditthorn, F., and Bartel, M.: Experiments to Determine a More Exact Method for the Valuation of Disinfectants, *Disinfection* 8: 62-66, 1923; *abstr. Chem. Abstr.* 18: 1314, 1924.

24. Brown, J. H.: The Vaseline Tube and Syringe Method of Micro Gas Analysis of Bacterial Cultures, *J. Exper. Med.* 35: 667 (May) 1922.

25. Süpfle, K., and Degeler, A.: Die Bedeutung optimaler Nähöbden zur Nachkultur bei der Prüfung von Desinfektionsverfahren, *Arch. f. Hyg.* 55: 189, 1916.

disinfectants. All of the cultures in cooked meat and also the serum broth contained viable spores. Since it was possible that the mercurials might have affected the organisms in such a way that although it was possible to recover them in culture mediums they might have no longer been capable of producing disease, guinea pigs were inoculated with 0.5 cc. of the final sediment diluted to 1 cc. at the same time the cooked meat and serum broth were inoculated. Since it was known that the strains of *Clostridium welchii* and *Clostridium sporogenes* were nonpathogenic for guinea pigs, these organisms were not used in the animal section of this experiment. One-tenth cc. of 1:20 lactic acid was injected along with the tetanus suspension to insure the proper necrosis for infection. The anthrax suspension was injected subcutaneously in the left thigh. The guinea pig inoculated with the untreated anthrax suspension (control) died on the second day; the metaphen and merthiolate treated spores caused death on the third day. The tetanus control and the two animals injected with treated organisms all died on the fourth day after injection.

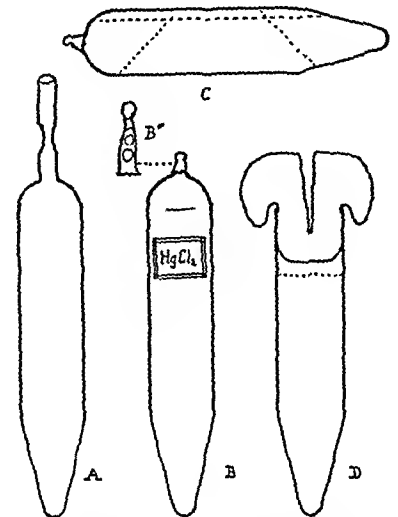
At this point a critical study of the technic was made and several errors were found. No technic is satisfactory in which there is a possibility that some of the organisms or spores may escape the action of the disinfectant entirely or for even a part of the supposed period of action. In suspension experiments of any type in which the organisms are placed in the disinfectant by means of a pipet, or in the case of the foregoing experiment in which the organisms were already in the centrifuge tube, there are many chances that there will be some bacteria not touched by the chemical agent, or at least not covered by the disinfectant for the full length of the desired period of exposure. This is true even though the suspension is made in one tube and transferred to another tube. Although theoretically possible, I doubt whether one can transfer such a suspension without some of it reaching a point on the tube at which it will not be entirely covered for the duration of the test. The "ringing effect" is also to be considered. That is, the rings left on the test tube as the liquid evaporates may leave a ring of bacteria on the surface of the glass well out of reach of the chemical being tested. This is very important in experiments in which the mercurials are left for as long as twenty-four hours, as in the case of some of the previous tests. This ringing is very noticeable in testing tinctures or solutions containing alcohol such as mercuric. No suspension experiment in which this type of mercurial is being tested can be considered correct unless this ringing factor has been taken into consideration.

To eliminate this source of error, some type of tube which could be sealed off in the flame was sought. If the suspension could be sealed in the proper type of tube and rotated in such a manner that the entire surface would be wetted for the period of exposure to the chemical agent, then this error would have been eliminated. After attempting to seal test tubes off in the flame uniformly, I decided that probably some ampule already on the market might be satisfactory. After trying several types of tubes I found the Judd and Simon²⁶ modification of the Keidel tube. Tube A shown in the accompanying illustration offers several advantages. It has a capacity of 50 cc., which allows a large volume of disinfectant to be used with an insignificant

volume of spores. The neck of the tube is already constricted and ready for sealing in the flame. The tube is so constructed that it has a centrifuge bottom and, by cutting the tube off with a hot wire and inserting a sterile cotton plug from a test tube of the same size, one has an ideal centrifuge tube for washing the bacteria. This eliminates another source of error in that it is not necessary to transfer the organisms from the time they are exposed to the disinfectant until they are planted into the medium. The point (bottom) of the tube is not sufficiently small to prevent free flow when the tube is rotated.

Since apparently none of the mercurials tested in the earlier work were capable of killing the spores on short contact, it was necessary to have a machine to rotate the tubes satisfactorily over long periods of time.

An off-center cam arrangement was made so that when the tubes were placed on it horizontally they would be entirely wetted in going through each cycle. The dotted lines in C show the extremes reached by the meniscus in traveling this cycle. The speed of the motor was set so that eighty complete cycles a minute were made. This was fast enough so that there was no chance for drying in any section of the tube. The tubes were rotated for twenty-three hours. About thirty minutes was required



A, Keidel tube (50 cc.) as described by Judd and Simon. B, tube A sealed off properly and ready to be placed on rocking machine. B', improper way of sealing tube; allows collection of air in neck of tube. C, tube B in horizontal position as placed on rocking machine. Dotted lines show changing positions of meniscus as tube is rocked, demonstrating that the entire tube is wetted during each cycle of the machine. D, tube B with top removed. Note divided cotton plug.

to inoculate from eight to twelve tubes and seal them in the flame before placing them on the machine, and thirty minutes was required for the first centrifuging, so that a total of twenty-four hours elapsed from the time the mercurial came in contact with the spores until it was removed.²⁷

The spore suspensions of the anaerobes are made to contain approximately 330,000,000 viable spores per cubic centimeter. One cc. of this suspension is placed in the Keidel tube with 40 cc. of the mercurial to be tested and the tube sealed and placed on the rocking machine. After the tubes had been removed from this machine and centrifuged, a filed line was made just above the label, as shown in B, and the tubes were opened by removing the top. All the mercurial but about 0.6 cc. can be decanted or pipetted off without disturbing the sediment. The remaining 0.6 cc. is thoroughly mixed with the sediment by means of a pipet, and about 0.2 cc. is removed for animal inoculation. One loop of the spore-mercurial mixture is planted in an appropriate medium and incubated. Forty cc. of

26. Judd, C. C. W., and Simon, C. E.: The Vacuum Tube of Keidel, as Applied to Blood Culture Work, J. A. M. A. 64: 822 (March 6) 1915.

27. The complete technic is available in the special reprint. Its great detail was considered inadvisable for a clinical publication of this work, and it has been condensed here.

sterile distilled water is added and the organisms are resuspended by washing up and down several times with a very fine capillary pipet. The tube is then plugged and centrifuged. This process is repeated three times, making a total of four washings. Although there is practically no turbidity in the final washing, when the sediment is diluted to 0.4 cc. a slight turbidity will remain, indicating the presence of organisms.

The technic in general has been to inoculate the proper recovery medium; that is, a medium which is ideal for the development of the spores if they have not been killed. In addition, mice have been inoculated to see whether or not the spores have been rendered noninfectious if they have not been killed. Representative results are given in table 2 and in most cases the protocols were repeated twice, making three sets of experiments.

The large amount of material in table 2 may appear quite complicated. It is hoped that this short explanation will obviate any difficulties:

As an example, *Clostridium septique* is considered under mercury bichloride. Spores of *Clostridium septique* were treated for twenty-four hours with mercury bichloride. The spores still suspended in the mercurial were used as an inoculum and were injected into mice and planted in a culture medium. Column 3 shows that the mice did not die even at the end of fourteen days, indicating that the spores were not capable of producing infection. Column 4 shows that the spores grew out in one day, indicating that the organisms were not killed. The results in column 5 and 6 are the same as those in 3 and 4; the inoculum, however, consisted of spores which had been washed four times to get rid of any mercurial present. The results in column 7 under "inoculum: treated spores in mercurial plus lactic acid" indicate that when the spores were injected along with lactic acid they were capable of producing infection and killing the mice. Column 8 shows that *Clostridium septique* could be recovered by cultural methods. Columns 9 and 10 show results similar to columns 7 and 8.

COMMENT ON THE CENTRIFUGE EXPERIMENTS

If these mercurials had been bactericidal, it would have been necessary to make many additional tests in order to prove the ability of the organic mercurials to disinfect instruments. Tests in the presence of various body fluids would have been made. Tests for organisms dried in pus, whole blood, saliva, bile or, in fact, any fluid which might be found about the body in operations would have been necessary. These tests would be of little value, since it was shown that the mercurials were unable to kill the spores even in twenty-four hours in the absence of body fluids and other factors which are known to decrease the bactericidal action of the mercurials.

One factor that may have influenced the results of these experiments is the production of sulfides in necrotic tissue. It is well known that sulfides are produced in decomposing tissue. Whether ammonium sulfide or hydrogen sulfide, it would tend to neutralize the mercurials on or about the spores. This will account for certain instances, not recorded in table 2, in which the animals died but no growth was obtained in the corresponding cultural experiments. The sulfide content of perspiration should be considered in experiments with mercurials. A polished coin will turn dark after being handled, owing to the action of sulfide from the

skin. This may account for the failure of the mercurials to disinfect the skin in certain tests. Not all these mercurials are affected immediately by sulfides, but as the mercury ionizes the inactive sulfide is formed.

Topley and Wilson¹⁴ (p. 698) state that the washed spores of *Clostridium tetani* are innocuous. Vaillard and Vincent²⁸ demonstrated that many millions of spores, when deprived of their toxin, could be introduced intramuscularly into guinea pigs without producing tetanus. Vaillard and Vincent found that if the tissues are injured in any way the spores will develop and tetanus will occur. A 22 gage needle was used for the injection in the present work and the mice usually struggled. This may account for tissue injury and subsequent tetanus infection in each instance with the washed spores. To preclude the possibility that the deaths were caused by the presence of a small quantity of tetanus toxin, as a control experiment some of the washed spores were further washed in an abundance of antitoxin and then in water. These were injected in the same manner as in the test, and death resulted. According to Topley and Wilson¹⁴ (p. 698) tetanus toxin in a dose of 0.0001 cc. will kill a mouse. The design of this test makes it impossible for a toxin content of even 1:1,000,000,000 to be present. If the mercurial treatment is included, the spores were subjected to seven washings and dilution to 40 cc. It has also been shown by Van Ermengem²⁹ that salts of the heavy metals destroy some anaerobic toxins.

The observations of Moll¹⁵ have been substantiated; that is, some of the mercurials are capable of affecting tetanus spores so that, although not actually killed, they are incapable of causing the death of the animals injected with them. In some instances it would seem that the washing process plays a greater role than the neutralizer in bringing about the recovery of the treated organisms.

Room temperature was used for all the experiments; it varied from 20 to 25 C. No experiments were made to determine the effect of a higher temperature for this is about average room temperature and these agents for "cold sterilization" are usually employed to avoid heating the instruments.

The twenty-four hour treatment period is about as long as could be conveniently employed and is much longer than is customarily used. A chemical agent which would require a longer period would not be practical, for many instruments are expensive and must be sterilized and reused several times in one day.

It is to be reiterated at this point that these experiments were not simply exposure experiments, made according to phenol coefficient methods or the string and bead technic, but were tests in which the organisms were sealed in with the disinfectant and constantly agitated to insure exposure of every organism to the disinfectant for the full period of twenty-four hours. The bacteriologic technic was designed to give accurate information on the one question Are the newer organic mercurials capable of killing the spores of anaerobes under the optimal conditions employed for sterilizing instruments? The answer, evident from a study of the tables, definitely indicates that none of the mercurials tested can be depended on to sterilize instruments in

28. Vaillard, L., and Vincent, H.: Contribution à l'étude du tétanos. *Ann. Inst. Pasteur* 5: 1-39, 1891.
29. Van Ermengem, E.: Ueber einen neuen anaeroben Bacillus, *Ztschr. f. Hyg.* 26: 34, 1897.

twenty-four hours even in the absence of organic matter and other factors known to decrease the activity of the mercurials.

SUMMARY

1. A review of the literature shows that claims are made that the various mercurials can be depended on to kill the spore-forming anaerobes.

2. A review of the various methods of testing indicates that in most instances bacteriologic technic has been violated or the tests used were not applicable to spore-forming organisms, so that the results cannot be depended on.

3. In a series of 120 surgical operations, bacteriologic examination of the cutting instruments after use

were found capable of sterilizing the instruments in twenty-four hours under actual conditions of use. *Clostridium welchii*, *Clostridium tetani* and *Clostridium sporogenes* were used as the test organisms.

6. In preliminary experiments according to the modified methods of Mueller and of Dittborn and Bartel sources of error were found.

7. An improved centrifuge technic was developed to determine whether the mercurials under optimal conditions are capable of destroying spores of anaerobes. The outstanding features of this technic are as follows: A sealed tube is used in which the organisms are exposed to the chemical agent for twenty-four hours. During this time the mercurial spore mixture

TABLE 2—Results of Mouse and Cultural Tests When Spores Treated with Mercurials Were Used

Mercurials Tested	Organisms	Inoculum Treated Spores in Mercurial				Inoculum Treated Spores Washed Four Times				Inoculum Treated Spores in Mercurial + Lactic Acid				Inoculum Treated Spores Washed Four Times + Lactic Acid			
		Death*	Day	Growth†	Day	Death	Day	Growth	Day	Death	Day	Growth	Day	Death	Day	Growth	Day
Mercury chloride, 1 1,000	<i>Clostridium tetani</i>	+	2	+	2	+	2	+	2	+	2	+	2	+	2	+	2
	<i>Cl. septique</i>	—	14	+	1	—	14	+	1	+	1	+	1	+	1	+	1
	<i>Cl. welchii</i>	—	30	—	60	—	30	—	60	—	30	—	60	—	30	—	60
	<i>Bacillus anthracis</i>	—	30	+	1	—	30	+	10	—	30	+	10	—	30	+	10
Mercurochrome 1 30	<i>Cl. tetani</i>	+	2	+	2	+	2	+	2	+	2	+	2	+	2	+	2
	<i>Cl. septique</i>	+	1	+	1	+	1	+	1	+	1	+	1	+	1	+	1
	<i>Cl. welchii</i>	—	30	+	1	—	30	+	1	—	30	+	1	—	30	+	1
	<i>B. anthracis</i>	+	3	+	1	+	3	+	6	—	30	+	1	—	30	+	1
Merphenyl nitrate 1 1,500	<i>Cl. tetani</i>	+	1	+	2	+	1	+	2	Tetanus	+	2	Tetanus	+	2	+	2
	<i>Cl. septique</i>	—	14	+	1	—	14	+	1	+	1	+	1	+	1	+	1
	<i>Cl. welchii</i>	—	30	—	60	—	30	—	60	—	30	—	60	—	30	—	60
	<i>B. anthracis</i>	+	5	+	6	+	5	+	1	—	30	+	1	—	30	+	1
Metaphen, 1 2,500	<i>Cl. tetani</i>	Tetanus‡	+	2	Tetanus	+	2	+	2	+	4	+	2	+	3	+	2
	<i>Cl. septique</i>	—	14	+	1	—	14	+	1	+	1	+	1	+	1	+	1
	<i>Cl. welchii</i>	—	30	—	60	—	30	—	60	—	30	—	60	—	30	—	60
	<i>B. anthracis</i>	—	30	—	60	—	30	—	60	—	30	—	60	—	30	—	60
Merthiolate 1 1,000	<i>Cl. tetani</i>	+	1	+	2	+	1	+	2	+	2	+	2	+	3	+	2
	<i>Cl. septique</i>	+	1	+	1	+	1	+	1	+	1	+	1	+	1	+	1
	<i>Cl. welchii</i>	—	30	+	2	—	30	+	2	—	30	+	2	—	30	+	2
	<i>B. anthracis</i>	+	4	+	6	+	3	+	1	—	30	+	1	—	30	+	1
Mertocyl 1 1,000	<i>Cl. tetani</i>	+	3	+	2	+	3	+	2	Tetanus	+	2	Tetanus	+	2	+	2
	<i>Cl. septique</i>	—	14	+	1	—	14	+	1	—	30	+	1	—	30	+	1
	<i>Cl. welchii</i>	—	30	—	60	—	30	—	60	—	30	—	60	—	30	—	60
	<i>B. anthracis</i>	—	30	—	60	—	30	+	1	—	30	+	1	—	30	+	1
Mercarboline 1 1,000	<i>Cl. tetani</i>	+	1	+	2	+	1	+	2	+	2	+	2	+	3	+	2
	<i>Cl. septique</i>	—	14	+	1	—	14	+	1	+	2	+	1	+	1	+	1
	<i>Cl. welchii</i>	—	30	+	24	—	30	—	60	—	30	—	60	—	30	—	60
	<i>B. anthracis</i>	—	30	+	1	—	30	+	1	—	30	+	1	—	30	+	1
Potassium mercuric iodide, 1 1,000	<i>Cl. tetani</i>	+	1	+	2	+	2	+	2	+	2	+	2	+	2	+	2
	<i>Cl. septique</i>	—	14	+	1	—	14	+	1	+	1	+	1	+	1	+	1
	<i>Cl. welchii</i>	—	30	+	2	—	30	+	2	—	30	+	2	—	30	+	2
	<i>B. anthracis</i>	—	30	+	1	—	30	+	1	—	30	+	1	—	30	+	1
Merocyl 1 200	<i>Cl. tetani</i>	+	1	+	2	+	1	+	2	+	1	+	2	+	2	+	2
	<i>Cl. septique</i>	+	1	+	1	+	1	+	1	+	1	+	1	+	1	+	1
	<i>Cl. welchii</i>	—	30	+	2	—	30	+	2	—	30	+	2	—	30	+	2
	<i>B. anthracis</i>	+	2	+	1	+	2	+	1	—	30	+	1	—	30	+	1
Mercury cyanide 1 1,000	<i>Cl. tetani</i>	+	1	+	2	+	1	+	2	+	1	+	2	+	2	+	2
	<i>Cl. septique</i>	—	14	+	1	—	14	+	1	+	1	+	1	+	1	+	1
	<i>Cl. welchii</i>	—	30	+	2	—	30	+	2	—	30	+	2	—	30	+	2
	<i>B. anthracis</i>	—	30	+	1	—	30	+	1	—	30	+	1	—	30	+	1

* + indicates not only death of the mouse but also characteristic autopsy results and positive cultures from the animal
† + indicates not only growth but also identification of the organisms inoculated. The number indicates the day on which growth was first observed
‡ In these instances the animals developed typical symptoms of tetanus but recovered

revealed 12 per cent contaminated with spore-forming anaerobes. Eight per cent of the skin knives were found to be contaminated with *Clostridium welchii* or similar organisms.

4. A study of the mercurial solutions available, summarized in table 1, indicates that these mercurials are used in dilutions of from 1:50 to 1:6,000 and vary in p_H from 3.5 to 10.5. This work was not made for the purpose of comparing the different mercurials available but rather to determine their efficiency as germicides for sterilizing instruments. One cannot help noticing, however, that the commercial products with the highest and lowest p_H were in general the most active.

5. In a series of sixty experiments with dental burs and detachable surgical blades, none of the mercurials

is agitated constantly to prevent evaporation "rings" and to insure complete wetting of the entire inner surface of the tube. Settling or layering of the organisms is also prevented. Animal inoculation as well as cultural tests were used to determine the efficiency of the various mercurials with this technic.

8. None of the mercurials were capable of killing the spores of *Clostridium tetani* or of making them innocuous. The work of Moll was substantiated, for in several instances typical symptoms of tetanus developed in the mice and the mice recovered. Contrary to the common belief, *Clostridium tetani* could be isolated from the site of injection in all the mice dying from tetanus.

9. In the majority of the cases the mercurials were incapable of killing the spores of *Clostridium septique*, *Clostridium welchii* or *Bacillus anthracis*, even in the

absence of body fluids and under conditions optimal for the action of the chemical agents.

10. Cultural experiments indicate that some of the mercurials may affect the spores in such a way that, although not actually killed, they are no longer capable of producing infection.

11. The results of the cultural tests show that results based on a comparatively short incubation period are not reliable since, in some instances, the treated spores developed only after twenty-four days.

CONCLUSION

1. The conflicting reports in the literature regarding the germicidal efficiency of the mercurials may be explained by noting that the methods of testing, in most cases, are not applicable to spore-forming organisms, in particular those tests which do not differentiate between actual killing and bacteriostatic action.

2. It is to be concluded from the results of the tests described in this paper that none of the mercurials examined can be depended on to sterilize instruments when spore-forming organisms are present. The question of disinfection is quite another problem. In the case of *Clostridium tetani* none of the mercurials rendered these spores noninfectious after twenty-four hours of contact. The spores were still capable of infecting the mice and producing tetanus. The spores of *Clostridium septicum* and *Bacillus anthracis*, however, could be rendered noninfectious in certain instances. That is, although it was possible to recover in these cases organisms in cultural experiments, they did not produce an infection when injected into animals.

3. To explain the ability of some of the mercurials to act as antiseptics is beyond the scope of this paper. However, their actual germicidal value for vegetative bacteria is questioned. After it was found that the mercurial solutions as commonly used are incapable of killing the spores of the pathogenic anaerobes in twenty-four hours, it was decided to determine their effect on some vegetative bacteria by the centrifuge method. Just as statements are made that some of these mercurials will kill spore-forming bacteria, some of the manufacturers claim that their particular product will kill vegetative bacteria in ten minutes. One of the mercurials used did not kill *Staphylococcus aureus* in thirty minutes, although no neutralizers or special recovery methods were used. Other vegetative bacteria were used and the results indicate that some method other than one based on phenol coefficient determination should be used to establish the ability of the mercurials to disinfect instruments.

4. Although it was found that the mercurials as available on the market are not germicidal for the pathogenic anaerobes, it is possible that one of the newer organic solvents, wetting agents or surface tension reductants might affect the spores in such a way that the mercurials would then be able to kill these organisms.

5. The method of testing used in the experimental work is not suggested as a standard method to be used for testing chemical agents for sterilizing instruments but is proposed as a method for determining the action of chemical agents on spores under the most favorable conditions. The object of the method is to eliminate all possible sources of error by insuring the action of the chemical on every spore for the full length of the period of exposure.

RECURRING ATLO-AXIAL DISLOCATION WITH REPEATED INVOLVEMENT OF THE CORD AND RECOVERY

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ST. PAUL

Between the atlas and the axis (first and second cervical vertebrae) there are three diarthroses. Two of these are lateral and have to do with articular processes, and the third is mesial. This mesial diarthrosis is between the posterior aspect of the anterior arch of the atlas (first cervical vertebra) and the anterior surface of the odontoid process of the axis (second cervical vertebra). Alinement between the atlas and the axis is maintained by the anterior and posterior atlo-axoid ligaments and by the transverse ligament of the atlas. This transverse ligament of the atlas is one of the most important structures in the body, for on its integrity one's life largely depends. It is attached on each end to a tubercle on the inner side of the lateral mass of the atlas, crosses the ring of this bone, dividing it into a small anterior portion for the odontoid process of the axis and a larger posterior portion for the spinal cord. If either the transverse ligament of the atlas or the odontoid process of the axis (dens) gives way, there is an anterior dislocation of the atlas on the axis. The pyramidal decussation lying just behind the odontoid process may be compressed with resulting paralysis of the extremities.

ATLO-AXIAL DISLOCATION

Dislocation of the atlas on the axis may be one of two types; spontaneous or traumatic.

Spontaneous Dislocation.—According to Watson Jones,¹ this condition is due to hyperemic decalcification of the atlas with loosening of the transverse ligament. This results from infections in the nasopharynx or elsewhere in the vicinity of the base of the skull. All cases have four features in common:

1. They occur most frequently during childhood.
2. They are preceded by inflammation anywhere in the upper cervical region.
3. There is a latent period of from seven to ten days between the time of the infection and the dislocation.
4. The part of the arch of the atlas nearest the infection is decalcified.

According to Woltman and Meyerding,² spontaneous atlo-axial dislocation may result in symptoms similar to those of cervical arthritis, pharyngeal abscess, meningitis, encephalitis, bulbar palsy, cerebellar tumor and myasthenia gravis.

Traumatic Dislocation.—Traumatic atlo-axial dislocation is usually due to a fracture of the odontoid process of the axis. This deprives the transverse ligament of the atlas of its anchorage and permits the atlas to slide anteriorly on the axis. The condition results from injuries to the neck, manipulative adjustments, convulsive seizures and birth injuries.

The symptoms of traumatic atlo-axial dislocation may be immediate or delayed. In cases in which the appearance of symptoms is delayed there may be a latent period of days, or even months or years. At the time of the injury the local symptoms may be absent or minimal and may disappear rapidly. Then, after the

From the Department of Psychiatry and Neurology, University of Minnesota Medical School, Minneapolis.
1. Jones, R. W.: *J. Bone & Joint Surg.* 16: 30 (Jan.) 1934.
2. Woltman, H. W., and Meyerding, H. W.: *S. Clin. North America* 14: 581 (June) 1934.

latent period, neurologic signs and symptoms develop. These frequently are obscure and progress very slowly. Cases reported by Schwarz and Wigton³ show slowly developing symptoms, which usually are more pronounced on one side. In many cases both legs and one arm are involved (as in the case here reported) and the picture is one of a slowly developing spastic paralysis with or without sensory involvement. One patient presented himself with a spastic weakness of the legs. The cause of this was not suspected until several months later, when a roentgenogram of the spine showed a dislocation of the atlas on the axis. Careful interrogation of the patient disclosed the fact that many years previously he had injured his neck in a fall. At the time there were no immediate symptoms.

The reasons given by various authors for the appearance of symptoms after a prolonged latent period are redislocation, progressive dislocation, excessive callous formation, pachymeningitis and pressure myelitis, irritation of the cord due to abnormal motility, late developing osteomyelitis and adhesive arachnoiditis with calcification (arachnoiditis ossificans). Stookey⁴ thought that the anchoring effect of the arachnoid on the spinal cord at one point and normal mobility of the rest of the cord produced chronic trauma of the cord with disturbance in cord conduction.

The only case found in the American literature that is similar to the one about to be reported is one described by Elliott and Sachs⁵ in 1912:

A man aged 50 fell at the age of 18 and landed on the back of his head. For six months after this he was in bed and was unable to move his head from side to side. He recovered on rest and then served for five years in the army. A few years later he fell, striking his left shoulder, and four or five months after this he showed symptoms of a high transverse myelitis. These disappeared completely on rest. Five years later, following another minor injury, he had temporary paralysis of the legs, accompanied by urinary incontinence. Seven years later he sustained his fourth injury, which resulted in immediate paralysis of the right arm and leg, double incontinence, paresthesia of both legs and weakness of both arms. Roentgenograms showed marked displacement of the atlas on the axis. The patient lived for two years and died of sepsis and other complications. Postmortem examination showed atlo-axial dislocation with involvement of the cord.

REPORT OF CASE

This case, like the one just reviewed, is unusual in that the patient suffered numerous atlo-axial dislocations with consequent symptoms of involvement of the cord, followed each time by complete recovery:

K. R., a white man aged 34, was a periodic drinker to excess of beer. His family, past and medical histories were not relevant to this report. In 1925, while driving a car, he fell asleep and landed in a ditch, sustaining multiple lacerations about the chest, hands, face and head and an injury to the lower part of the back. As he remembers it, he was not able to move his arms or his legs for several days. He was told that he had a sprained back and he remained in bed for three weeks, after which he used crutches for six weeks. Recovery was complete.

About a year later the patient was in another automobile accident and the overturned car came to rest on his neck. His right arm and both legs were paralyzed for several weeks and it was necessary for him to be catheterized for some time after the accident. His neck was taped and he was told that he had

torn some ligaments. In about two months he had completely recovered except that since then he has felt a twinge in the back of his neck and down the lower part of the spine every time he stumbles a bit or is jarred in any way.

In 1932 he again rolled over in a car and was unconscious for about fifteen minutes. When he came to he had some pain in the lower part of the back but was not hurt sufficiently to make it necessary for him to go to a hospital. He went to work as a farm hand but quit after two weeks because his back hurt him.

At 2 a. m., Oct. 22, 1936, the patient was admitted to the Ancker Hospital in St. Paul with an admitting room diagnosis of suspected tumor of the cervical cord. The notes are very sketchy, but it is stated that for two years he had been having bladder symptoms (nature not stated). October 21, after he retired a paralysis of the right arm and of both lower extremities developed. Superficial examination at the hospital showed hyperactivity of all tendon reflexes and bilateral ankle clonus but normal plantar responses. There was anesthesia of the right side of the body below the third cervical level and of both sides of the body from about the ninth dorsal segment down. The right arm and both lower extremities were paralyzed. At 5 p. m. October 22 the patient was able to move his left leg and close his right fist, the sensory pattern was the same as it had been on his admission to the hospital. The following day there was some return of motion in the paralyzed extremities. Roentgenograms of the lower part of the spine showed "negative lumbar spine and sacrum. Slight narrowing of the first lumbar vertebra, probably developmental unless due to an old slightly compressed fracture" (see first injury).

June 7, 1937, he was admitted to the Ancker Hospital in an intoxicated condition. He had been in an automobile accident but there had not been any serious injury so he did not remain for examination.

Some time later in June the patient was in another automobile accident and the front of his car was telescoped in such a way as to pin his neck against the back of the driver's seat. He was dazed but not unconscious. For about two days he bled from the mouth but at no time was he paralyzed.

October 12 the patient was feeling well until he stooped over to lock the door of his house before going to work. He felt a stinging sensation in the back of his neck and fell to the floor immediately. Whether or not he was unconscious cannot be determined. Three hours later his wife found him and reported that he could not move his legs or his right arm. He was put to bed and he vomited numerous times. The record shows that on the next day there was a spastic paraplegia with weakness of the right upper extremity. The chart does not indicate that a sensory examination was made at that time. I saw him in consultation October 24 and by that time some of the functions of the right arm had returned. There was sensory impairment below an indefinite level corresponding to about the second lumbar dermatome. The muscles of both lower extremities showed a slight spastic weakness, the tendon jerks were brisk and the plantar responses were not elicited. There was no involvement of the sphincters. Roentgenograms of the cervical spine showed an anterior dislocation of the atlas on the axis with fracture and some displacement of the odontoid process. One week later the right leg was stronger than the left, sensation was normal and both plantar responses had become flexor. A spinal tap was not performed because I wanted to avoid as much as possible all manipulation of the spine. Instead I advised orthopedic consultation and in November a fusion operation was done on the cervical spine by Dr. C. C. Chatterton of St. Paul. Aside from some minor episodes associated with his getting drunk and removing his orthopedic collar from time to time the patient has remained well and has not had a recurrence since the cervical spine became ankylosed.

SUMMARY

1. The transverse ligament of the atlas is one of the most important structures in the body because it maintains the alignment between the atlas and the axis. Dislocation of the atlas on the axis (atlo-axial dislocation) causes compression of the spinal cord with resulting symptoms.

3. Schwarz, G. A., and Wigton, R. S.: Fracture Dislocation in the Region of the Atlas and Axis with Consideration of Delayed Neurological Manifestations and Some Roentgenographic Features, *Radiology* 28: 601-607 (May) 1937.

4. Stookey, Byron: Adhesive Spinal Arachnoiditis Simulating Cord Tumor, *Tr. Am. Neurol. A.*, 1926, pp. 129-156; *Arch. Neurol. & Psychiat.* 17: 151-178 (Feb.) 1927.

5. Elliott, G. R., and Sachs, Ernest: Observation on Fracture of the Odontoid Process of the Axis with Intermittent Pressure Paralysis, *Ann. Surg.* 56: 876-882, 1912.

2. Atlo-axial dislocation may be spontaneous or traumatic.

(a) Spontaneous atlo-axial dislocation is due to hyperemic decalcification of the atlas with loosening of its transverse ligament. It follows infections about the nasopharynx and base of the skull.

(b) Traumatic atlo-axial dislocation may cause symptoms immediately or after a latent period of varying length.

3. In the case reported here the patient suffered a fracture of the odontoid process (dens) and subsequently had a number of atlo-axial dislocations with resulting symptoms of compression of the cord and recovery.

4. Only one similar case is found reported in the American literature.

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VESICULAR PHARYNGITIS AND STOMATITIS

AN UNUSUAL EPIDEMIC OF POSSIBLE
HERPETIC ORIGIN

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During the months of July and August 1938 there was an epidemic of febrile vesicular pharyngitis and stomatitis in three of the summer camps located on the shores of a lake in central New Hampshire. The disease presented three distinctive clinical features: vesicular throat lesions, high infectivity and a benign, self-limited course. Since several consultants as well as ourselves had never encountered this disease, and a survey of the literature did not reveal a report of a similar epidemic, this presentation seems justified despite unavoidably meager laboratory studies. It is to be hoped that the disease may be more completely studied if and when it appears elsewhere.

COURSE OF THE EPIDEMIC

The camps involved in the epidemic will be designated as A, B and C. Camp A is a boys' camp with about 100 campers and thirty-five councilors and attendants. Camp B is a girls' camp and camp C a boys' camp: each accommodates about fifty campers and fifteen councilors and attendants.

In camp A the first cases appeared July 17 and the last case was diagnosed July 31. Although a self-imposed quarantine of the camp was instituted July 19 and all fresh cases were isolated as effectively as camp facilities permitted, the disease eventually developed in sixty-one campers, seven councilors, three Negro cooks and one white cook. The height of the epidemic was reached July 22, with thirteen new cases, and followed a week of almost continuous rainfall.

July 23 a councilor from nearby camp B presented characteristic throat lesions and was promptly isolated, and the camp was unofficially quarantined. Several evenings previously this councilor had visited an eating place frequented by councilors from camp A prior to their quarantine. August 1 three new cases were discovered; five others on August 14 brought the total in camp B to ten, as shown in the accompanying table.

By this time the first case had appeared at camp C, at the opposite end of the lake; in the ensuing ten days prior to the close of this camp twenty-one cases in all developed. As in camp A, isolation of cases was ineffectual in checking the epidemic, which had not fully burned itself out by the close of the camp season.

There were 106 cases in the entire epidemic, including three cases outside the camps. So far as is known there were no cases resembling this infection in any of the other three boys' and three girls' camps bordering on the lake. The remaining population of the region consists of 5,000 inhabitants, approximately evenly divided between permanent and summer residents. One of our three outside cases occurred in a youth aged 19 who had had herpes zoster of the right lumbar region about three months previously. The second was in a girl aged 6 years living near camp C, and the third was in a woman aged 33 living near camp A. It is quite possible that there were additional outside cases which did not come to our attention; it is unlikely, however, that many cases in camps A, B and C were overlooked, since campers in whom the disease did not develop had their throats examined daily during the epidemic.

CLINICAL ASPECTS

The disease was characterized by a sudden onset with headache, malaise and a variable degree of sore throat and fever, but the most significant finding (present in all of the cases) was the appearance in the throat of one or more yellowish white, slightly raised vesicles 1 or 2 mm. in diameter, usually surrounded by an intense red areola. These lesions were most frequently found on the faucial pillars (anterior more often than posterior), on tonsillar tissue when present or on the soft palate. Many of the cases seen at camp C (but none in the other two camps) presented, as well, lesions on the buccal mucosa or on the gums near the dentogingival margins, and in one case on the under surface of the tongue. Only one or two lesions might appear in the entire course of the illness, or the entire visible pharynx might be studded with them. The lesions often occurred in small clusters, which later coalesced. In most instances the individual or coalescent vesicles ulcerated, leaving a shallow, punched out, grayish yellow crater measuring from 2 to 4 mm. in diameter; some lesions never ulcerated. The lesions disappeared in from five to ten days, usually outlasting the fever.

In a few of the earlier cases in camp A the mucosa adjacent to the vesicles became deeply injected and even hemorrhagic, with moderate edema, simulating the so-called streptococcal sore throat. In many cases there was swelling of lymphoid tissue in the tonsillar fossa. In a few cases in which the lesions were restricted to the tonsils the appearance resembled a follicular tonsillitis, but pus or caseous material could not be wiped from the tonsillar surface. In several cases marked edema caused the bulging of the fauces usually associated with peritonsillar abscess.

As already indicated, the usual complaints were headache, malaise, feverishness and sore throat. The soreness of the throat was usually not severe, and the symptom was more often brought out only on questioning. Moreover, there was no correlation between the appearance of the throat and the subjective complaints; several of the patients with marked ulceration had no soreness whatever. Dysphagia was rarely met, and no patient complained of hoarseness. The patients with lesions of the mouth as well as of the throat complained of soreness or burning of the mouth, tongue

or guais. In two or three cases the disease was ushered in with severe headache, which disappeared with the onset of fever; in one of these cases the headache lasted several days before fever and throat vesicles appeared.

The highest fever (not exceeding 104 F. in any of our cases) was usually attained on the first day of the illness but occasionally not until the second or third day. The throat lesions usually appeared with the rise in temperature, but occasionally there was no fever until a day or more after the lesions were detected. Conversely, in a few cases early in the epidemic fever preceded the appearance of vesicles by a day or two. The temperature typically remained elevated for from two to four days and then hovered slightly above normal for an additional three or four days. In a few cases the temperature returned promptly to normal after one or two days, only to show slight secondary rises on the fourth or fifth day but never equaling the previous febrile level. Some cases were afebrile throughout.

Physical examinations were consistently negative except for the condition in the throat. No cutaneous eruptions were noted. Rigidity of the neck or the Kernig sign was not elicited in any case. The spleen and liver were not felt nor was there any significant enlargement or abnormal tenderness of the lymph nodes. The ear drums were normal in all cases except two: one showed minimal injection of both drums, rapidly subsiding; the second showed marked injection of one drum, which also subsided rapidly. Atypical systolic cardiac murmurs were heard in three cases; these were said to have been noted before the boys entered camp. The highest pulse rate recorded was 120 beats per minute. In every case throughout the epidemic the lungs remained perfectly clear on physical examination. In two cases, moderate generalized abdominal pain was the initial complaint; abdominal examination, however, was negative and the pain disappeared within twenty-four hours.

EPIDEMIOLOGIC ASPECTS

Although the age incidence varied from 7 to 67 years, the disease appeared to have a predilection for the younger age groups, only fifteen of the 106 cases occurring in persons 18 years of age or over. These are roughly one fourth of the exposed adults, whereas the disease developed in about one half of the exposed campers. The adult members of the camp were probably exposed even more than the campers, since the care of the sick devolved on them. In general, the older the patient the milder was the constitutional reaction.

The maximum incubation period could be established on two patients at camp A. The first was a white youth aged 19, enlisted from the outside to help with the camp cooking; he had no contact with known active cases, but the infection developed five days after he entered camp. The second was a boy aged 10 years who was admitted as a camper (his parents fully aware of the risk) in the first week of the epidemic; the disease developed seven days later.

In view of the alleged relationship between certain herpetic infections and chickenpox, as well as the clinical resemblance of the vesicles to the enanthema of chickenpox, the previous histories of 157 campers were reviewed. The vesicular pharyngitis developed in seventy (or 56 per cent) of 124 campers who had had chickenpox and in eighteen (or 55 per cent) of the thirty-three who had not had chickenpox. Apparently previous infection with chickenpox bears no relationship to this type of pharyngitis.

It is noteworthy that during and shortly after this epidemic four cases of herpes zoster auricularis were encountered. Only one of these was in a camper, a boy aged 14 years in camp C who had herpes zoster auricularis beginning August 9 and in whom vesicular pharyngitis developed August 21. Cases occurred in two 16 year old school girls and a third in a woman aged 45. All of the patients bathed in the lake almost daily, but there was no direct contact between any two of them.

Four cases of mild conjunctivitis (so-called pink eye) appeared in camp A and two in camp C. This is regarded as no more than the usual camp incidence. Bacteriologic study of these cases was not undertaken. One patient at camp A had had bronchopneumonia three weeks before the onset of the epidemic, but examination of his lungs gave negative results and he was

Calendar of New Admissions

Day of Month	July		August	
	Camp A	Camp B	Camp B	Camp C
1			3	..
2			..	..
3			1	..
4			..	..
5		..	..	..
6			..	..
7		..		
8				..
9				
10				..
11				..
12				..
13				1
14			5	..
15		..	..	..
16		..	..	2
17	2	..	..	3
18	2	..	..	1
19	6		..	1
20	5	..	..	4
21	3		..	4
22	13		..	3
23	9	1	..	2
24	11		..	..
25	3		..	..
26	5		..	..
27	4		..	..
28	1			
29	4			
30	3			..
31	1			..
Total cases	72		10	21

asymptomatic at least one week before the disease developed. There were no cases of anterior poliomyelitis or encephalitis in the neighborhood during or following this epidemic.

LABORATORY ASPECTS

Our laboratory studies were necessarily restricted. Leukocyte counts were made in twelve cases during the first three days of the disease and ranged between 5,500 and 11,000 cells per cubic millimeter. Urinalyses carried out in seventy-two cases during the height of the illness and two weeks after the cessation of symptoms were negative in respect to albuminuria, glycosuria and urinary sediment.

The local lesions in fifty-one cases were investigated bacteriologically with direct smears, cultures or both. In fifteen cases smears stained with gentian violet did not show sufficient numbers of spirochetes and fusiform bacilli to be diagnostic of Vincent's infection.¹ Seventeen of twenty cultures carried out in Loeffler's

1. Black, W. C. Acute Infectious Gingivostomatitis ("Vincent's Stomatitis"), *Am J. Dis Child* 56: 126 (July) 1938

blood serum, dextrose agar or hormone agar showed a preponderance of gram-positive diplococci surrounded by well marked capsules. In two cases Neufeld typing of these organisms showed capsular swelling with type III pneumococcus antiserum. In addition to the gram-positive diplococci there was the usual mixed growth of gram-positive and gram-negative staphylococci, streptococci and bacilli usually found in the normal mouth. No Klebs-Loeffler bacilli were identified. Direct smears in almost all the remaining cases investigated also showed a heavy preponderance of gram-positive diplococci. Two of the blood cultures made in three febrile cases shortly after the onset were negative, and the third was contaminated.

Cultures of the milk and water in two of the camps were submitted to the state board of health; no significant abnormality was reported.

For the purpose of demonstrating a possible virus etiology, an attempt was made to duplicate the experiments of Youmans,² Long³ and Dodd, Johnston and Buddingh.⁴ Material was obtained from the lesions in two cases—in one on the second day of the disease and in the other on the third day—and rubbed well into the scarified cornea of a rabbit. In neither case had a herpetic keratitis developed at the end of forty-eight hours.

COMMENT

The concurrence of four cases of herpes zoster auricularis, a disease rarely encountered in general practice, with these cases of vesicular pharyngitis raises the question of whether one may be an atypical manifestation of the other. The fact that the pharyngeal lesions in most of our cases were bilateral, that they had a predilection for the tonsils and pillars and that the distribution of the pain was local rather than trigeminal is against this possibility.⁵ Furthermore, in no patient did a facial paralysis or a cutaneous eruption develop.

The luxuriant growth of encapsulated diplococci and their appearance in large numbers in direct smears from the lesions strongly suggested to us at first that they were etiologically significant. The lesions noted in our cases, however, did not resemble the glistening gray membrane described as typical of pneumococcal pharyngitis (which itself is not a commonly recognized clinical entity).⁶ It is also recognized that the pneumococcus may be more easily cultured from the throat in the presence of any acute infection of the upper respiratory tract. Finally, the benign course of this pharyngitis contrasts with the severe consequences of pneumococcal infection as usually observed elsewhere in the body.

The question presents itself whether the buccal lesions in these cases might be the oral manifestation of foot and mouth disease ("aphthous fever" of the French literature).⁷ The primary vesicular and secondary ulcerative nature of the lesion is similar in the two. Foot and mouth disease is transmissible from cattle to

man.⁸ No cases of this disease were reported in cattle in the neighborhood, however, and pasteurized milk was used in all the camps. None of the patients in the series showed lesions of the hand, foot, face or nose, and the rapid spread observed in the present epidemic has not been described in the human form of foot and mouth disease.⁹

Herpetic origin of the disease seems the most likely, although such a conclusion is suggested only by clinical evidence to be outlined later and is therefore open to serious objection. The herpetic nature of some cases of vesicular and ulcerative pharyngitis and stomatitis has been demonstrated.¹⁰ The lesions seen in our cases correspond closely to those described in the literature as typical of herpetic pharyngitis and stomatitis (sometimes called aphthous stomatitis¹¹ in the English and German literature). The drawing reproduced in Youmans'² article, for example, shows lesions on the palate resembling those seen in many of our cases. We were fortunate in having Dr. Perrin Long³ examine a number of the throat lesions; he has given us permission to quote his opinion that they were herpetic. We do not regard our failure to demonstrate a virus as significant, since the conditions under which the experiments were carried out were far from ideal, and technical difficulties could easily account for it.

Although a search of the literature fails to show a report of an epidemic with purely buccopharyngeal localization of the vesicular lesions, a few epidemics of herpes labialis (occasionally referred to in the older literature as "herpetic fever") have been reported, and in exceptional instances there was involvement as well of the throat, buccal mucosa or gums.¹² Dodd, Johnston and Buddingh⁴ recently reported a series of twenty-eight cases of herpetic stomatitis with simultaneous involvement, in a few rare cases, of the soft palate, tonsils and posterior pharynx. The cases appeared in groups, but there were not enough at any one time to warrant the use of the word "epidemic."

SUMMARY

An epidemic of vesicular pharyngitis and stomatitis occurred in three New Hampshire summer camps. The disease, affecting 106 persons, was characterized by a high infectivity and ran a benign, uncomplicated course of four or five days. The chief signs were fever and the appearance of vesicles, which subsequently ulcerated, on the faucial pillars, soft palate and tonsillar tissue when present. The disease occurred in patients from 7 to 67 years of age but had a predilection for the young. The maximum incubation period in two controlled cases was five and seven days. Cultures and direct smears of the lesions showed a preponderance of pneumococci. A herpetic origin of the disease is favored on clinical grounds, although experimental proof is lacking.

2. Youmans, J. B.: Herpetic Fever with Stomatitis: Report and Discussion of a Case in Which the Virus Was Isolated, South. M. J. 25: 228 (March) 1932.

3. Long, P. H.: Herpetic Pharyngitis and Stomatitis: A Report of Three Cases, J. Clin. Investigation 12: 1119 (Nov.) 1933.

4. Dodd, Katharine; Johnston, L. M., and Buddingh, G. J.: Herpetic Stomatitis, J. Pediatr. 12: 95 (Jan.) 1938.

5. Alexandre, André: Etude clinique des manifestations du zona en oto-rhino-laryngologie, Ann. d'oto-laryng., October 1934, p. 982.

6. Richey, deV. G.: Pneumococcus Pseudomembranous Pharyngitis, J. A. M. A. 98: 730 (Feb. 27) 1932. Mollison, W. M.: Pneumococcal Infections of the Nose, Throat and Ear, Guy's Hosp. Rep. 83: 423 1: (Oct.) 1933. Henderson, R. G.: Acute Pneumococcal Pharyngitis, Lancet 1: 615 (March 24) 1934.

7. Séé, Pierre: La question de la fièvre aphteuse chez l'homme, Rev. de méd., Paris 51: 146 (March) 1934.

8. Von Scheitz, László: Maul- und Klauenseuche beim Menschen, Klin. Wchnschr. 13: 630 (April 28) 1934. Fessler, A.: Maul- und Klauenseuche beim Menschen, Wien. klin. Wchnschr. 47: 555 (May 4) 1934. Jost, Johannes: Ist Maul- und Klauenseuche auf den Menschen übertragbar und wie kann man sich eventuell davor schützen? Ztschr. f. Aerztl. Fortbild. 35: 79 (Feb.) 1938. Wagener, K.: Die Maul- und Klauenseuche als medizinisches Problem, Med. Klin. 34: 173 (Feb. 11) 1938.

9. The references in footnote 8 and Séé.⁷

10. Long³ Youmans² Dodd, Johnston and Buddingh.⁴

11. Gerstenberger, H. J.: The Etiology and Treatment of Herpetic (Aphthous and Aphtho-Ulcerative) Stomatitis and Herpes Labialis, Am. J. Dis. Child. 26: 309 (Oct.) 1923.

12. Savage, G. H.: Epidemic of Herpetic Fever, Lancet 1: 95, 1883.

Zimmerlin, Franz: Eine Herpesepidemie im Basler Bürgerspitale, Cor. Ztschr. Aerzte, Basel 13: 137 (March 15) 1883. Hirsch, Carl: Bl. f. Schweiz. Aerzte, Basel 13: 137 (March 15) 1883. Hirsch, Carl: Febris Herpetica (Leichtes Erklärungsfeber, Febris ephemera, Febricula) in Nothnagel, H.: Spezielle Pathologie und Therapie 111, Vienna, Alfred Hölder 1: 1. 1902. Zlocisti, Theodor: Ueber die Febris herpetica, Beitr. z. klin. d. Infektionskr. 8: 157, 1919. Mayer, Karl: Herpes labialis et demicus, Schweiz. med. Wchnschr. 51: 703 (July 28) 1921.

THE DISTRIBUTION OF SULFANIL-
AMIDE IN THE EYE

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The widespread success enjoyed by sulfanilamide and its derivatives in the treatment of some infectious diseases has naturally called attention to possible applications in ophthalmology. Encouraging reports have already appeared in their use in trachoma by Kirk and his associates,¹ Loe² and others; in gonorrheal ophthalmia by Magitot and his associates,³ Luis and Ricardo, Fernandez,⁴ Willis⁵ and others; in orbital cellulitis by Goldenburg⁶ and Sziegh;⁷ in abscess of the lid by Sziegh, and in herpetic corneal lesions by Kleefeld.⁸ Experimentally, streptococcal infections in rabbits' eyes have been successfully treated with sulfanilamide by Rambo.⁹ Little work has been done, however, on the penetration of this compound into the eye, although Marshall and his co-workers¹⁰ demonstrated that it readily entered various tissues and fluids of the body. Rambo, on the basis of a single determination, concluded that it appears in the aqueous and vitreous humors and in the lens after oral administration. The other ocular tissues were not analyzed. The present investigation was undertaken in an attempt to secure information on the distribution of sulfanilamide in the eye under various conditions.

EXPERIMENTAL

1. Penetration into the Eye After Single Massive Doses by Mouth.—Sulfanilamide 0.2 Gm. per kilogram of body weight was suspended in approximately 25 to 30 cc. of water and partially dissolved by the addition of several drops of concentrated hydrochloric acid. This solution was then administered by stomach tube to dogs under pentobarbital sodium anesthesia. At specified time intervals, aqueous humor was aspirated and a blood sample drawn. This was followed immediately by the enucleation of the eyeball, which was dissected into the following components: lens, vitreous humor, corneoscleral layer and chorioretinal layer. These were weighed immediately and all tissues but the vitreous humor were transferred to mortars, where they were thoroughly ground with sand and a minimum volume of 15 per cent trichloroacetic acid. Each mixture was transferred quantitatively to a 15 cc. tube and

centrifuged for from five to ten minutes. The supernatant liquid was decanted into a test tube calibrated at 10 cc. and the precipitate twice washed with 1 cc. portions of the trichloroacetic acid. The supernatant liquid and washings were combined and diluted to the mark with more of the acid. This solution was diazotized and coupled with dimethyl-alpha-naphthylamine¹¹ and compared with the properly prepared standards, according to the method of Marshall.¹² The vitreous humor was transferred to a centrifuge tube and deproteinized with 5 cc. of 15 per cent trichloroacetic acid. The remainder of the determination was carried out as already described. To determine the sulfanilamide in the aqueous humor, 7 volumes of water and 2 volumes of 15 per cent trichloroacetic acid were added to each volume of the aqueous. This was centrifuged and aliquot portions of the supernatant liquid were treated as before. Reproducible results could be obtained with as little as from 0.1 to 0.2 cc. of aqueous.

Sulfanilamide was found to penetrate into the eye with great rapidity. Within fifteen minutes after ingestion of the compound, traces could be detected in each of the ocular tissues and fluids. As shown in table 1,

TABLE 1.—Sulfanilamide (Milligrams per Hundred Cubic Centimeters) in Tissues and Fluids After Large Single Dose (0.2 Gm. per Kilogram)

	Hours							
	1	2	3	4	6	12	24	48
Blood	21	33	170	180	191	147	44	1.1
Aqueous humor .	0.7*	15	101	109	116	92	41	0.6
Lens	0.7	0.7	18	27	86	95	54	25
Vitreous humor	0.3	0.7	76	84	86	82	5.2	0.4
Corneoscleral layer...	12	18	116	134	123	11.7	3.8	0.7
Chorioretinal layer .	24	33	150	132	150	154	45	0.7

* The mean of two determinations; all other values are the mean of three or more determinations.

with the exception of the lens all these attain their maximum concentration at about the sixth hour. In the crystalline lens the peak is reached at about the twelfth hour. By far the most rapid rise occurs between the second and the third hour. The ocular constituents and blood showed a five to ten fold increase during this period. Again the lens was the sole exception. Here the sharpest rise was between the fourth and the sixth hour. The concentration of sulfanilamide was found to be in the following order: blood, chorioretinal layer, corneoscleral layer, aqueous humor, crystalline lens and vitreous humor. Those tissues attaining the highest concentration fell the most precipitously. Thus the blood contained 19.1 mg. per hundred cubic centimeters after six hours but only 4.4 mg. per hundred cubic centimeters at the end of twenty-four hours. Similarly the chorioretinal value had fallen from 15 to 4.5 mg. per hundred cubic centimeters in this period and the corneoscleral from 13.4 to 3.8. On the other hand, the lens still contained 5.4 mg. per hundred cubic centimeters after twenty-four hours, although its peak was only 9.5 mg.^{12a} The vitreous showed even less of a decrease, dropping only from 8.6 mg. at six hours to 5.2 mg. at twenty-four hours.

11. Whenever the dimethyl alpha naphthylamine was not of a clear straw color it was distilled before use, as advocated by Stevens and Hughes (Para Aminobenzenesulfonamide. Notes on the Colorimetric Assay, J. Am. Pharm. A 27:36 [Jan J 1938]).

12. Marshall, E. K., Jr., and Litchfield, J. T., Jr.: The Determination of Sulfanilamide, Science 88:85 (July 22) 1938.

12a. This difference in the rate of depletion of sulfanilamide from the crystalline lens as compared to the aqueous and blood may cause an upset in osmotic equilibrium which manifests itself clinically as transient myopia

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1 Kirk, R., McKelvie, A. R., and Hussein, H. A. Sulfanilamide in the Treatment of Trachoma, Lancet 2:994 (Oct 29) 1938

2 Loe, Fred. Sulfanilamide Treatment of Trachoma. Preliminary Report, reported in Society Transactions, Arch Ophth 20:880 (Nov) 1938

3 Magitot, A., Dubois Poulsen, A., and Geffoy, Y. Bull soc d'opht de Paris 2:82, 1938, abstr Zentralbl f d ges Ophth 41:517 (Aug) 1938

4 Fernandez, L. J., and Fernandez, R. F. Sulfanilamide in Gonorrheal Ophthalmia, Am J Ophth 21:763 (July) 1938

5 Willis, Thayer. Sulfanilamide in Ophthalmia Neonatorum, Yale J Biol & Med 10:275 (Jan) 1938

6 Goldenburg, Michael. Sulfanilamide in Ophthalmology, Am J. Ophth. 21:54 (Jan) 1938

7 Sziegh, B. Orvosi hetil 82:527 (May 28) 1938, abstr. Zentralbl f d ges Ophth 42:56 (Nov) 1938

8 Kleefeld, G. Bull Soc. belge d'opht 76:14, 1938; abstr. Zentralbl f. d. ges Ophth 42:170 (Dec) 1938

9 Rambo, V. C. The Effects of Sulfanilamide as Determined in the Eyes of Rabbits, Am J. Ophth 21:739 (July) 1938

10 Marshall, E. K., Jr., Emerson, Kendall, Jr., and Cutting, W. C. Distribution of Sulfanilamide in the Organism, J. Pharmacol & Exper. Therap 61:196 (Oct) 1937.

After forty-eight hours the lens still possessed 2.5 mg. per hundred cubic centimeters of sulfanilamide—more than three times as much as any other ocular tissue.

2. *Penetration into the Eye After Divided Therapeutic Doses.*—In the previous experiment sulfanilamide was employed in large single doses—doses considerably higher than those recommended for clinical use.¹³ The effect of the drug given in therapeutic doses was next investigated.

Sulfanilamide 0.075 Gm. per kilogram of body weight was administered daily in four divided doses. Gelatin capsules containing the required dose was given with the food (forcibly if necessary) at 8 a. m., noon, 6 p. m. and 10 p. m. Blood was drawn and eyes were removed under light ether anesthesia after one, two, four and six days, and the analyses performed as described in the preceding section.

The values thus obtained are summarized in table 2. A fairly uniform level was maintained during the experiment, although the values are far lower than those secured in the previous experiment. Since all analyses were made at 8 a. m. (ten hours after the previous feeding), the values reported represent the minimum concentration during the experiment.

To learn whether the amounts thus determined differed materially from the sulfanilamide concentration at other times during the day, blood was drawn immediately before each administration of the drug. Expressed in milligrams per hundred cubic centimeters, the following values were secured: at noon 2.1, at 6 p. m. 2.7, at 10 p. m. 3.5 and at 8 a. m. 1.4. These values are quite low when one remembers that a blood level of from 5 to 10 mg. per hundred cubic centimeters is advocated for optimum therapeutic action and that such a level can be maintained in man on doses comparable with those used in our experiment.

TABLE 2.—Sulfanilamide (Milligrams per Hundred Cubic Centimeters) in Tissues After Therapeutic Divided Doses (0.075 Gm. per Kilogram Daily)

	Dose	Days			
		1	2	4	6
Blood.....	0.037 Gm. per Kg. b i d	2.6	2.2	2.7	1.4*
	0.019 Gm. per Kg. q i d	2.1	1.2	3.2	2.3
Aqueous humor	0.037 Gm. per Kg. b i d	1.8	1.5	1.6	1.1*
	0.019 Gm. per Kg. q i d	1.8	1.1	..	2.6
Vitreous humor	0.037 Gm. per Kg. b i d	1.2	1.0	1.6*	1.3*
	0.019 Gm. per Kg. q i d	1.6	1.1	2.2	1.4
Lens	0.037 Gm. per Kg. q i d	3.0	2.8	3.9	2.0†
	0.019 Gm. per Kg. q i d	1.4	2.6	2.8	1.4
Chorioretinal layer	0.037 Gm. per Kg. b i d	2.8	2.1	2.2	2.6*
	0.019 Gm. per Kg. q i d	2.7	2.5	2.2	4.1
Corneoscleral layer	0.037 Gm. per Kg. q i d	1.4*	1.4	4.3	1.4*
	0.019 Gm. per Kg. q i d	1.7	1.7	2.6	2.7

* The mean of two determinations

† Single determination; all other values are the mean of three or more determinations.

If the same amount of sulfanilamide was given in two doses (at 9 a. m. and 5 p. m.) instead of in four, very little difference was apparent in the tissue content. Table 2 illustrates this close agreement for periods of one, two, four and six days.

3. *Action of Heat and Chemicals on the Concentration in Aqueous Humor.*—In an attempt to increase the concentration of sulfanilamide in the eye on a given dose, the effect of heat and drugs on the eye

was investigated. No significant difference in the amount of sulfanilamide could be detected between that found in the aqueous humor of an untreated eye and one to which heat had been applied for two hours. Negative results were also secured with ethylmorphine hydrochloride, atropine and physostigmine. Aqueous humors of eyes that were treated with acetyl-beta-

TABLE 3.—Effect of Heat Paracentesis and Drugs on Sulfanilamide in Aqueous Humor

	Time in Hours	Blood	Sulfanilamide, Mg per 100 Cc Aqueous Humor	
			Control Eye	Treated Eye
Hent	2	..	4.0	4.2
Ethylmorphine hydrochloride	2	..	9.5	9.3
Physostigmine	1½	..	3.8	4.0
Atropine	2¼	..	3.4	3.1
Mecholyl	2¼	..	9.2	9.8
Mecholyl	2¼	..	8.0	9.1
Mecholyl	2	..	5.6	5.3
Paracentesis	2¼	18.4	8.4	12.7
Paracentesis	2½	22.3	11.4	12.8
Paracentesis	2¼	21.1	15.0	17.2

methylcholme chloride (mecholy), however, showed a distinct increase over the control values, as is evident from table 3.

4. *Effect of Paracentesis on Sulfanilamide in Aqueous Humor.*—The aqueous humor of each eye treated with mecholy was rich in protein. This was evident from the turbidity of the solution, the volume of precipitate after addition of trichloroacetic acid and a marked tendency of the aqueous to clot. Mecholy, therefore, appears to increase the permeability of the capillaries in the ciliary body, probably through their dilatation. This action is similar to that of paracentesis, which is known to produce a second aqueous whose constituents closely approximate that of blood. The effect of paracentesis on the sulfanilamide content of the aqueous humor was therefore investigated.

Three dogs under pentobarbital sodium anesthesia were given 0.2 Gm. of sulfanilamide per kilogram of body weight by stomach tube. Two hours after administration, the aqueous from the right eye of each animal was aspirated. Thirty minutes later aqueous humor was drawn from each eye and samples of blood were removed for analysis. The analyses, as reported in table 3, indicate that the sulfanilamide content of the second aqueous was increased, lying between the values found for the blood and that for the original aqueous.

5. *Local Applications of Sulfanilamide.*—If sulfanilamide can readily penetrate the conjunctival epithelium and through the cornea, a more effective method of therapy might be attained by local application than by oral administration. To test this possibility, sulfanilamide was dusted on the conjunctival sac and cornea of the animals and allowed to remain for two hours. This produced a moderate reaction, causing chemosis and staining of the corneal epithelium. After repeated irrigation and scraping of the epithelial layers of the conjunctiva and cornea, the underlying subconjunctival tissue and corneal stroma gave a positive test for sulfanilamide. However, one could not rule out contamination entirely. The aqueous and vitreous humors were aspirated by a posterior approach so as to avoid contamination from the conjunctival sac. Not a trace

13 Marshall, E. K., Jr., Emerson, Kendall, Jr., and Cutting, W. C. Para-Aminobenzenesulfonamide. Absorption Excretion: Method of Determination in Urine and Blood, J. A. M. A. 108: 953 (March 20) 1937.

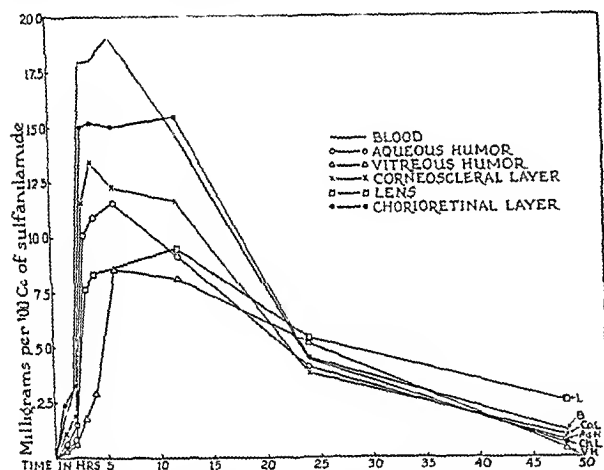
of sulfanilamide could be detected in either fluid despite the extreme delicacy of the test (sensitive to 1 part in 20,000,000).¹³

When 1 cc. of a saturated solution of sulfanilamide was injected subconjunctivally, a concentration of 0.3 mg. per hundred cubic centimeters was found in the aqueous, a value far lower than that obtained when sulfanilamide is given by mouth.

6. *Sulfanilamide in Tears.*—Tears were collected from two patients receiving 3 Gm. of sulfanilamide daily by mouth. They were analyzed by the method described for aqueous humor. The tears of the first patient, secured three hours after the administration of 1 Gm. of the drug, contained 1.5 mg. per hundred cubic centimeters. Those of the second patient, collected seventeen hours after an equal dose, contained 0.8 mg. per hundred cubic centimeters.

COMMENT

The ready permeability of all tissues thus far examined to sulfanilamide is undoubtedly an important factor in its therapeutic efficacy. The data here presented show that the tissues of the eye can be included



Concentration of sulfanilamide in the ocular tissues and fluids following a single large dose

in this group. The distribution of the sulfanilamide in the various ocular tissues is of interest. The chorioretinal layer possessed the highest concentration of the drug, very closely approximating that found in the blood. This layer is also the most vascular tissue of the eye. Next in order, both of vascularity and of sulfanilamide concentration, is the corneoscleral layer. Unfortunately, the cornea and sclera were not analyzed separately, so the value secured is the mean of an avascular tissue (cornea) and of a slightly vascular tissue (sclera). The aqueous humor possesses the next highest concentration, with the vitreous humor and the lens (an avascular tissue) bringing up the rear. These observations suggest that simple diffusion is the chief mechanism in operation and that the tissues do not act to concentrate the drug. The aqueous and vitreous humors obtain the compound by dialysis from the blood. The lens, having no blood supply, must secure its portion from the surrounding media. This indirect transfer plus the presence of a lenticular capsule results in the slower building up of the peak in the lens and conversely in a slower depletion.

The daily portion of sulfanilamide given in two divided doses maintained practically the same level in

the eye as the same quantity administered four times a day. The chart shows that the drop in the various tissues and fluids from the sixth to the twelfth hour is slight; consequently ingestion of the drug every twelve hours should be almost as effective as every six hours. There is no apparent explanation for the difference between the values reported for man and the considerably lower levels obtained by us on dogs.

The action of mechohyl in the eye to produce an increase of the aqueous sulfanilamide may have some clinical significance. However, the increase, though definite, is relatively slight. The results obtained after local administration of sulfanilamide indicate that such procedures are valueless as well as irritating. Since the penetration into the eye of sulfanilamide taken by mouth is so rapid and the levels attained are so high, there is little purpose in administering it by any other route.

Its detection in tears was to be expected, since it has been found in every body fluid thus far analyzed. This is merely another indication of its widespread penetrability.

Since this work was undertaken, sulfapyridine (2- [para-aminobenzene sulfonamido] pyridine) has come into prominence as a possible substitute for sulfanilamide in certain infections. Experiments on this compound similar to those reported here are now under progress in this laboratory.

SUMMARY AND CONCLUSIONS

1. Sulfanilamide can be detected in all ocular tissues and fluids within fifteen minutes after its oral administration.

2. The concentration of sulfanilamide in the eye has been determined one, two, three, four, six, twenty-four and forty-eight hours after a single massive dose by mouth. The maximum is reached around the sixth hour. The concentration of the tissues and fluids examined, listed in decreasing order, were as follows: blood, chorioretinal layer, corneoscleral layer, aqueous humor, lens and vitreous humor.

3. Little difference could be detected in the tissues of dogs when therapeutic quantities were administered twice a day or four times a day.

4. Heat, atropine and physostigmine applied locally have no effect on the sulfanilamide concentration of the aqueous humor. Mecholyl, similarly applied, increases this value.

5. The second aqueous contains somewhat more sulfanilamide than does the original aqueous.

6. Sulfanilamide has been analyzed in tears.

720 North Michigan Avenue.

The Prophecy of Robert Boyle.—The way to our understanding of infectious disease was first clearly indicated by the studies of Pasteur on fermentation. In fulfillment of the prophecy of Robert Boyle made in the seventeenth century that the problem of infectious disease would be solved by him who elucidated the nature of fermentation, the investigations begun by Cagniard-Latour and by Schwann and carried to a brilliant culmination by Pasteur revealed the living and specific nature of the various micro-organisms which cause the several forms of fermentation and especially of putrefaction, and thus led by analogy first to logical speculation, then to experimental proof of the etiological relationship between certain of the minute forms of life and the communicable diseases.—Zinsser, Hans; Enders, John F., and Fothergill, LeRoy D.: *Immunity Principles and Application in Medicine and Public Health*, New York, Macmillan Company, 1939.

HEREDITARY DEFORMING
CHONDRODYSPLASIA

REPORT OF TEN CASES IN ONE FAMILY

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We are all omnibuses in which our ancestors ride,
and every now and then one of them sticks his head
out and embarrasses us.

—*Oliver Wendell Holmes.*

My purpose in this paper is to report ten cases of such embarrassment; that is, ten cases of a relatively uncommon hereditary disease known as hereditary deforming chondrodysplasia.

Hereditary deforming chondrodysplasia is, as the name implies, a hereditary condition in which abnormal cartilaginous growth results in deformity. Although not all cases show deformities, the name used in this paper has become the accepted designation for this disease and is better and more descriptive than most of the synonymous terms, among which are Ollier's disease, hereditary multiple exostoses, diaphysal aclasis, hereditary multiple enchondromas, multiple cartilaginous exostoses and multiple exostoses.

HISTORY OF LITERATURE

Caesar Hawkins in 1837 is said to have been among the first to describe the condition as "laminated exostoses." However, the report of a typical case occurs in the *Lancet* for July 23, 1825, in the reports from Guy's Hospital.¹ The report discusses a case of Mr. Ashton Key's and the concise description will bear quotation:

The subject of this affection is a healthy looking lad about sixteen years of age; the bone tumors, which are situated in different bones, first began to form about four years since; their progress has been attended with little or no pain; and it was only on account of their inconvenience that he came into the hospital for relief.

The principal tumour is on the inside of the right tibia, just below the head, and as it were growing from the inner ridge or spine of the bone; the tumour is very firm and immovable, about the size of an hen's egg, with its surface somewhat irregular; the integuments appear tense, but the tumour is not at all tender upon pressure, and there is no enlargement or irregularity to be detected upon any other part of the bone.

In a similar situation to the preceding tumour, is one upon the opposite tibia, not, however, of such magnitude; upon the lower and outer part of the radius, just above the styloid process, is another bony tumour; and also another immediately above the head of the ulna. As we have before stated, these swellings are not attended with pain, and, from their particular situation, do not interfere much with the action of the muscles; no treatment has yet been had recourse to. The disposition to throw out an exuberance of bony matter is by no means an uncommon occurrence, and is, probably, connected with some peculiar state of the constitution.

The first reports in this country were written by Gibney² in 1875-1876 and there are few and scattered reports³ in the literature until 1915-1917, when Ehren-

fried⁴ collected and reported all cases in American and foreign literature and wrote the outstanding paper on this disease. Since that time reports have been more numerous, although reports are confused, some authors reporting as hereditary deforming chondrodysplasia cases of Ollier's disease and achondroplasia and others reporting cases without any hereditary history. Two of the best recent papers are by Alley⁵ and Mahorner.⁶

The cases here reported correspond in every respect to the syndrome known as hereditary deforming chondrodysplasia, which is defined by Alley as "a hereditary disturbance of bone growth beginning early in childhood and characterized by multiple cartilaginous and osteo-cartilaginous growths within or on the skeletal system. It is a retardation of normal transformation of cartilage into bone and not primarily a bone tumor."

Clinically patients with this condition may show visible or palpable bumps over the long bones and deformities, particularly in the bowing and shortening of the forearms. Many of them are below normal height, owing to shortening of the long bones. The symptoms that call for treatment are deformity, pressure on nerves or tendons or interference with the motion of joints. Malignant degeneration is said to occur in 5 per cent of cases, but the percentage is probably lower than that.

In diagnosis the hereditary factor, the symmetrical distribution of the exostoses, their multiplicity and the x-ray appearances are important. X-ray examination shows multiple exostosis of the long bones in the epiphysal region but springing from the diaphysal side and directed away from the epiphysis along the line of muscular pull. The exostoses vary from simple spikes to pedunculated and cauliflower types and from well ossified spurs to typical chondromas. The epiphyses may be misshapen or absent, although they do not produce any exostoses themselves.

The bones most frequently affected occur in this order: ulna, fibula, femur, humerus and phalanges. The carpus, tarsus, vertebrae, skull and sternum are not involved, since pure cartilaginous or membranous bone escapes this process.

PATHOLOGY

Microscopically these exostoses show an irregular arrangement of cartilage cells and apparently the cells on the metaphysal side of the epiphysal line are responsible for the growths. A report on case 1 of this series by Dr. Thibaudeau of the New York State Institute for the study of malignant disease reads as follows:

Sections of tissue received in the case of H. O. C., June 14, 1932, showed a marked hyperplasia of cartilage with, in a few areas, some bone formation. The laying down of bone is irregular but offers no suggestion of malignancy. The cartilage in places shows degeneration with calcium deposits in these areas. In the portions where bone is being laid down, typical histology of growing bone is noted.

Our diagnosis at that time was osteochondroma or chondroma. The histologic picture is not inconsistent with chondrodysplasia.

Grossly, the appearance of these growths varies from single bony spurs to chondromas with a slim bony shell. They are not found in embryos or fetuses but cases have been recorded in patients at the age of 2 years, and when the lower end of the ulna is the seat of an exostosis the normal ossification of its epiphysis is

Dr. R. Plato Schwartz, professor of orthopedic surgery, of the Strong Memorial Hospital, Rochester, N. Y., placed at my disposal roentgenograms and records of two of the cases, which came under the observation of his department.

1. Guy's Hospital Report, *Lancet* 8: 91 (July 23) 1825.
2. Gibney, V. P.: *M. Rec.*, 1875; *Am. J. M. Sc.* 72: 73, 1876; *M. Rec.* 15: 589, 1879.
3. Wright, J. W.: *D. Y. M. J.* 45: 358 (March 26) 1887. Davis, G. G.: *Am. J. Orth. Surg.* 3: 234, 1905-1906. Oschner, E. H.: *Ann. Surg.* 46: 608, 1907. Percy, N. M.: *Surg., Gynec. & Obst.* 20: 619, 1915.

4. Ehrenfried, Albert: Hereditary Deforming Chondrodysplasia—Multiple Cartilaginous Exostoses. *J. A. M. A.* 68: 502 (Feb. 17) 1917.
5. Alley, R. G.: *Radiology* 28: 576 (May) 1937.
6. Mahorner, H. R.: *J. Pediat.* 10: 1 (Jan.) 1937.

interfered with, indicating that the process is well established before the age of 3. Growth appears to stop when skeletal growth stops at the age of 20 or 22, and regression of the exostoses has been noted in some cases. There is apparently no relation to rickets or syphilis, but the disease is probably related to multiple enchondromas.

INCIDENCE

Ehrenfried in 1915 and 1917 found that the reported cases in the literature total about 700. Of those, ninety-nine cases were reported from the United States. Hale⁷ in 1930 collected fifty more cases in the English literature since 1917. The percentage, according to nationality, is 60 per cent German, 27 per cent French, 8 per cent English and 5 per cent all other nationalities. Few Negroes are affected, and in this country Anglo-Americans predominate. The patients comprising this series are of Irish origin. The consensus of statistics shows

by the father twice. It is said that no cases have been reported of the condition being transmitted by an unaffected male, but there appears to be no reason why this should not be true.

Keith⁸ believes the inheritance to be mendelian in character, but Oberndorf claims that there is no definite sequence to it.

ETIOLOGY

The etiology of this condition is obscure, and many theories of etiology and mechanism of its production have been advanced. The neoplastic theory is not tenable, as growth and development of exostoses stop at the age of 20 to 22 years with the attainment of skeletal maturity. It is apparently unrelated to rickets or vitamin deficiency; if it were, there should be no hereditary factor.

Kelly Hale,⁷ in an attempt to test the question of infectious origin, fed blood and saliva from his patients



Fig. 1 (case 1).—Left forearm, showing pedunculated type of exostosis.



Fig. 2 (case 3).—Right knee, showing chondromatous type of exostoses of femur and tibia.



Fig. 3 (case 3).—Left knee, showing exostoses of femur and tibia.

that males are affected more frequently in the ratio of about 3 to 1. In this series there are eight males and seven females.

Reincke in 1892 found 172 cases in thirty-six families; one family was followed through five generations; two families were followed through four generations, fifteen through three generations and twelve through two generations.

Ehrenfried in 1917 showed heredity as a factor in 176 of 234 cases, 174 occurring in forty-two families: in two through four generations, in fifteen through three and in twenty-one through two. In the family here reported there are fifteen cases in three generations. It is transmitted by males more frequently than by females: by fathers thirty-five and by mothers twenty times, according to Ehrenfried. Two mothers had affected children by different husbands and one father had affected children by two marriages. In two cases it was transmitted by unaffected mothers and in two instances it was seen to skip a generation. In this series it was transmitted by the mother in three instances and

to fifty pairs of white mice without the production of tumors in any of their progeny. It is unrelated to syphilis or tuberculosis. Kahn tests were done on three of this series and all gave negative results.

The distribution of the disease is the same as that of thyroid deficiency, and the possibility of a glandular disturbance, as of the thyroid or pituitary, has been considered by some.

Keith and Janssen think that it is due to the failure of the process of breaking down of bone and shaping or modeling of the bone, as described by John Hunter.

Hale, working on the basis that the bones most frequently involved are those which are most frequently fractured and that the incidence is highest in those countries in which skeletal trauma is greatest, has advanced the interesting theory that it is produced by impressions made on the germ plasma, consequent to fractured bones and their complex healing process or that the patients "are made susceptible through transmission from past generations of various obnoxious environmental experiences."

7. Hale, Kelly: *Ann. Surg.* 91:92 (July) 1930.

8. Keith, A.: *J. Anat.* 54:101, 1919-1920.

Geschickter and Copeland⁹ believe that a failure in adequate development of the periosteum results in (1) a failure of the cortex to attain full thickness and (2) the failure of an inadequate periosteum to limit the growth of bone.

Hume¹⁰ believes that it is due to the abnormal behavior of the cells of the growth disk and a failure of subperiosteal bone to keep pace. He states that an abnormal stimulus to the center of the disk and failure of ossification results in enchondroma. Abnormal stimulus to a localized portion of the periphery of the disk results in single pedunculated exostoses and a more generalized stimulus of the growth disks of the long bone results in multiple exostoses. None of these theories are completely satisfying and it would be surprising if they were, as the question of the cause and method of production of this condition involves the highly complex and fundamental problems of heredity and of bony growth.

cases deformities are present. Seven of the cases were proved by x-ray evidence. Three others presented exostoses on examination. Four of the patients are dead, two of whom had been examined by Dr. Cole and Dr. Knoll and were known clinically to have had exostoses. The other patients are said by the family to have had definite exostoses. The other living patient I have not had an opportunity to examine because he lives at a distance.

REPORT OF CASES

CASE 1.—Miss H. O'C., aged 27, a nurse, was admitted to St. Jerome Hospital, April 7, 1931, for the excision of bony spurs from the right radius and ulna because of pain and interference with movements of the wrist. Unfortunately roentgenograms are not available. No pathologic examination was made on the excised specimens. The operative result was good.

June 14, 1932, the patient was again operated on, this time for pain in the left upper quadrant of the abdomen, and a tumor was excised from the ninth left rib. The operative result was good.



Fig. 4 (case 7).—Lateral view of left forearm, showing large exostosis of left radius.

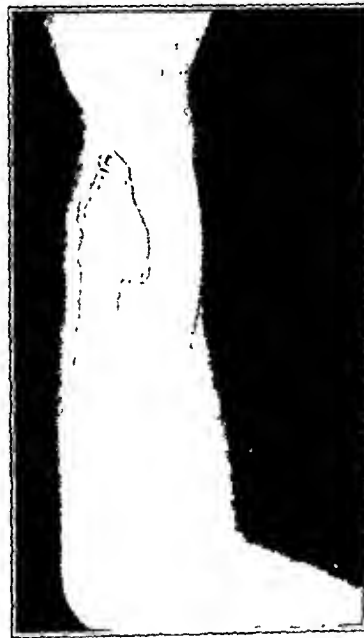


Fig. 5 (case 8).—Anteroposterior view of left forearm showing characteristic "arrow-head" deformity of lower end of ulna, with marked bowing of radius.



Fig. 6 (case 9).—Anteroposterior view of both forearms. Right side shows large exostosis of lower end of ulna with marked bowing of radius.

COMPLICATIONS

The commonest complications of this disease are due to pressure of the exostoses on nerves or interference with the function of muscles, tendons and joints. They are subject to trauma, since they may often project and strike against objects, particularly about the knee. Deformities, especially due to shortening of the ulna, may require correction. Five per cent are said to become malignant, but this percentage is probably too high. These conditions should remain untreated until after bony growth has stopped if possible. Indications for removal are deformity, interference with the function of joints, muscles or tendons, and evidence of a malignant condition or an increase in size after bony growth has stopped.

My series includes fifteen cases of this disease in three generations of one family. The reports illustrate well most of the points that have been discussed. The hereditary influence is well shown and in some of the

At the present time roentgenograms of both knees and both forearms show multiple exostoses of the lower ends of both femurs and upper ends of both tibias. The exostoses on the femurs are spikes, while those on the tibias are pedunculated. The left forearm shows a long pedunculated exostosis arising from the radius, lying between the radius and the ulna. The right forearm shows no tendency to recurrence of the spurs previously removed. A roentgenogram of the pelvis showed a small bony projection on the inner aspect of the neck of the right femur (fig. 1).

CASE 2.—A man aged 25, married, a chauffeur, has exostoses of both knees and of the right ankle, disclosed on examination. He has known about them for several years. Roentgenograms were not made. He is a brother of patient 1.

CASE 3.—A single man, aged 50, a laborer, 5 feet 4 inches (163 cm.) tall, has large, easily visible and palpable exostoses of the lower ends of both femurs and the upper ends of both tibias on the inside. The patient is in good health. He has had a perforated ulcer twice, about a year apart six or seven years ago. He has never been operated on for exostoses and has had no pain or inconvenience from them (figs. 2 and 3).

CASE 4.—A married man, aged 52, a printer, 5 feet 6 inches (168 cm.) tall, is a brother of patients 3 and 5 and father of

9. Geschickter, C. F., and Copeland, M. M.: Tumors of Bone. New York, American Journal of Cancer, 1936.
10. Hume, J. G.: Brit. J. Surg. 17: 236 (Oct.) 1929.

patients 7 and 8 (both girls) two unaffected sons and one affected son who died at the age of 9 years in 1918. At the age of about 20 the patient had an exostosis removed from the right knee and at the present time he has small exostoses of the inner aspects of the heads of both tibias.

CASE 5.—A married man, aged 48, a foreman, 5 feet 7 inches (170 cm.) tall, a brother of patients 3 and 4 and the father of patients 9 and 10, has a small, well developed and unmistakable exostosis on the inner aspect of the upper end of the right tibia. His general health has always been good. He has experienced no inconvenience from exostoses. One daughter is unaffected.

CASE 6.—V. M. McL., a schoolgirl aged 13, has exostoses which were first noticed on the left arm at the age of 5 years. This has regressed so that there is at the present time only a slight irregularity over the lower end of the radius on the external aspect. There is a small easily palpable exostosis on the inner aspect of the upper end of the left tibia. The patient's mother, who is dead, was known to be affected and the mother's sister is patient 1.

CASE 7.—C. L., a schoolgirl aged 15, sister of patient 8 and daughter of patient 4, has exostoses on both knees which are troublesome; there is about 1 inch shortening of the right leg. There are also exostoses of the forearms (fig. 4).

CASE 8.—J. L., a schoolgirl aged 11, sister of patient 7, has marked deformity of the left forearm due to shortening of the ulna and bowing of the radius, similar to that of her cousin, patient 9. There is also deformity about both knees. Her general health is good (fig. 5).

CASE 9.—P. L., a girl aged 18, a student at business school, daughter of patient 5 and sister of patient 10, was first found to have exostoses on the left ankle at the age of 18 months. In April 1931 she was admitted to the Strong Memorial Hospital with a deformity of the right forearm and pain and swelling of the left ankle. Dr. W. W. Fray's report on the roentgenograms taken at that time is quoted at length because it illustrates many of the typical points in the x-ray examination (fig. 6).

The anteroposterior and lateral views of both knees showed numerous exostoses at the ends of the shafts of all the bones of this region. They were located at the upper end of the tibias and fibulas fairly close to the epiphyseal lines but entirely on the diaphyseal sides of these lines. Exostoses were also noted at the lower ends of the femur on the diaphyseal side of the epiphyseal line. In general, the larger and heavier exostoses were seen about the right knee. All these exostoses showed a broad, heavy base, and many of them were directed away from the joint. The epiphyses of this region showed no involvement of this type.

The anteroposterior and lateral views of both lower legs showed exostoses at the lower ends of both tibias, mostly on the lateral aspect of the bone. The adjacent portions of the tibias were deformed or modified by the pressure of these exostoses. The small bones of the ankle appeared normal except for a small excrescence on the plantar aspect of the left calcaneus.

The anteroposterior and lateral views of both forearms showed an extreme deformity with lateral bowing of the radius and marked stunting in length of the growth of the right ulna which resulted in an abnormally short right forearm. A large heavy exostosis was present at the lower end of the right ulna, which projected mainly on the medial aspect of the shaft, deforming the outlines of the adjacent bundles of muscle. The lower end of the diaphyses of this bone showed no distinction between cortex and medulla but appeared to be entirely replaced by the material in the exostoses. Owing to shortening of this bone the lower epiphysis of the ulna was at a considerable distance from the carpal bones of the wrist and did not appear to articulate with them. Only the lower end of the radius articulated with the carpal bones, producing a conspicuous anomaly of the right wrist, which produced a marked deformity. At the upper end of the ulna the articulation appeared atypical. The lower left radius showed a smaller exostosis projecting from the lower shaft. The ulna was not deformed and its lower epiphysis entered into articulation of the wrist.

Multiple cartilaginous exostoses of all regions were examined. A rather pronounced dystrophy of growth had occurred at the right lower forearm, owing undoubtedly to the failure of the lower epiphyseal line of the ulna to carry on its normal function, resulting in a decreased length of bone. This was probably due to the fact that the exostoses in this region ran up to the epiphyseal line itself.

April 29, 1931, the patient was operated on; the head of the right radius was excised to straighten the right forearm and several exostoses were removed from the lower end of the left tibia. The operative result was good in that the function of the arm was much better. The pathologic report on tissue from the tibia was "an irregular laying down of bone and cartilage with no evidence of tumor formation."

CASE 10.—J. L., a schoolboy aged 15, the brother of patient 9, was admitted to the Strong Memorial Hospital outpatient department Nov. 2, 1931, for x-ray examination. Exostoses had first been noted on the ribs as a small child and on the right knee at the age of 7.

A report on the x-ray examination of the long bones was exostoses in all regions examined.

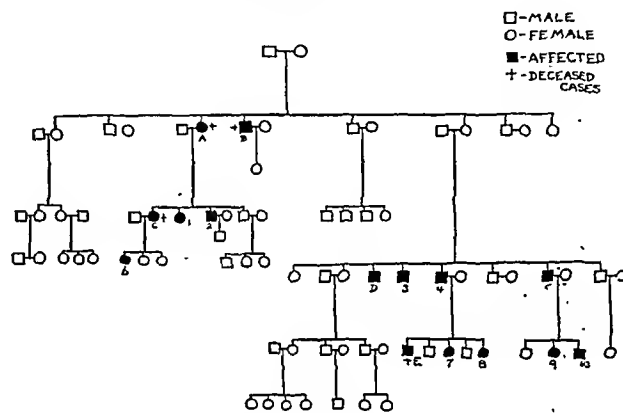


Fig. 7.—Distribution of cases in this family. Cases indicated by numerals proved by x-ray or clinical examination by author. Cases indicated by letters accepted on report of family and other physicians. The squares indicate males and the circles females; the solid black indicates affected members of the family, and the dagger indicates deceased members.

Figure 7 shows the relationship between the patients. The cases here reported are so indicated.

The patients who died or whom I have not examined but have included in the chart on testimony of the family or other physicians are indicated by letters:

CASE A.—A female patient of Dr. I. A. Cole's of Batavia had large exostoses of the knee.

CASE B.—A male patient of Dr. G. H. Knoll's of Le Roy, N. Y., had large exostoses of the ankle.

CASE C.—This woman was said by her sister and her husband to have had exostoses of the knees.

CASE D.—This man is said to have exostoses, according to his brothers; he lives at a distance and was not examined.

CASE E.—A boy aged 9 years, died in 1918 following an injury to the exostoses, operation and influenza. He was said by physicians to have had many exostoses, according to his father.

SUMMARY

1. Fifteen cases of hereditary deforming chondrodysplasia in three generations were observed. Nine of these were proved by x-ray and clinical examination by the author; the others are accepted on the strength of clinical examinations by other physicians in two cases and on the family history in the other three.

2. The ten cases reported illustrate the heredity factor. There are three brothers affected; two of them have two affected children each.

3. There are two cases of shortening and bowing of the forearm.

4. The multiplicity of exostoses is shown in all the cases. Only enough roentgenograms were taken in several of the cases to prove the diagnosis and not to show the distribution or number of exostoses. All plates have been retouched with white ink to bring out the outline of the bony growths.

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THE MECHANISM OF FIXED DILATATION OF THE PUPIL

RESULTING FROM IPSILATERAL
CEREBRAL COMPRESSION

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AND

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For many years it has been recognized that when a patient with evidence of increased intracranial pressure becomes suddenly comatose and shows one dilated and fixed pupil, a presumptive localization of an expanding lesion in the ipsilateral cerebral hemisphere is permissible. Macewen¹ suggested the possible diagnostic value of the sign, and the more recent works of Rand,² Holman and Scott,³ Kaplan⁴ and Hoessly⁵ have proved its practical localizing value. The mechanism producing this phenomenon has not been clear. Various explanations have been suggested, the most common being that it is due to direct pressure on the third nerve.

A series of patients admitted to the neurosurgical service with unilateral expanding cerebral lesions at some distance from the midbrain have shown ipsilateral pupillary dilatation as a sudden near terminal or terminal sign. Of these, nine patients have been selected for this report because of their conditions and one patient has been included whom Dr. F. H. Mackay allowed us to study. Six of the group died and from the anatomic studies the only explanation for the dilated and fixed pupil has seemed to be direct pressure on the third nerve by the ipsilateral hippocampal gyrus, which had herniated over the free edge of the tentorium of the cerebellum (fig. 1). In three of these fatal cases there were recent infarctions in the ipsilateral occipital lobe due, it was concluded, to disturbance of blood flow through the posterior cerebral artery or its branches by the direct pressure of the herniated brain (fig. 2). Observations made on the four patients who recovered after operative removal of the ipsilateral expanding cerebral lesion also supported the explanation of the sign arrived at from postmortem studies.

To make the evidence for concluding that the sign was due to direct pressure on the third nerve more than circumstantial, experimental extradural compression was carried out, monkeys being used for the experiments. In five of fifteen *Macacus rhesus* monkeys the

experiments went awry as the result of technical errors. Of the remaining ten animals, seven showed ipsilateral fixed dilatation of the pupil and ptosis and three showed dilatation and slight ptosis, but some reaction to light remained. Ipsilateral hippocampal herniations (fig. 3) similar to those in human beings were produced in the ten animals by extradural compressions but no infarctions of the occipital lobes or pontile hemorrhages were encountered. The herniations produced were acute and chronic. The acute herniations were made under anesthesia, while in the chronic ones the animals were allowed to recover from the anesthesia after operation and were carefully watched as the intracranial pressure increased and the third nerve signs developed.

The histories and examinations of three patients, together with the results of one of the acute experimental herniations and one of the chronic ones, will be given in some detail, since the observations recorded are representative and show the type of studies on which our conclusions are based.

In the majority of instances in which we have observed a dilated and fixed pupil as a localizing sign, the condition of the patients has been critical and they have been unable to cooperate sufficiently for us to recognize other signs of complete paralysis of the third nerve. In the following case of extradural hemorrhage



Fig. 1.—A, tumor in the left frontal lobe. The hippocampal gyrus on the left side shows marked herniation (B) directly over the third nerve (C). No infarction of the occipital lobe is present and there are no hemorrhages in the midbrain. Herniation outlined by arrows. This patient's left pupil was dilated and fixed at the time of admission and the left palpebral fissure was narrowed. She was clear mentally. After the history and examination were completed lumbar puncture was done. Gradually the usual headache became more intense, the blood pressure began to rise and she vomited. Stupor, coma, slowing respiration and finally cessation of breathing followed in sequence. She died fourteen hours after the lumbar puncture.

from a torn middle meningeal artery, the patient was able to carry out the examiner's instructions and there proved to be a total paralysis of the third nerve.

CASE 1.—G. N., a man aged 28, was referred by Dr. C. D. MacIntyre of Vankleek Hill, Ont. Twenty-four hours before admission the patient had suffered a blow to the right side of

From the Montreal Neurological Institute.

1. Macewen, William: The Pupil and Its Semiological Aspects, *Am. J. M. Sc.* 94: 123, 1887.

2. Rand, C. W.: Significance of Dilated Pupil on Homolateral Hemiplegic Side in Cases of Intracranial Hemorrhage Following Head Injuries, *Report of Seven Cases*, *Arch. Surg.* 18: 1176 (April) 1929.

3. Holman, Emile, and Scott, W. M. J.: Significance of Unilateral Dilatation and Fixation of Pupil in Severe Skull Injuries, *J. A. M. A.* 84: 1329-1332 (May 2) 1925.

4. Kaplan, Abraham: Chronic Subdural Haematoma: A Study of Eight Cases with Special Reference to the State of the Pupil, *Bram* 54: 430-439 (Dec.) 1931.

5. Hoessly, H.: Das Verhalten der Pupillen beim traumatischen Hirn drucke (Compressio cerebri), *Mitt. a. d. Grenzgeb. d. Med. u. Chir.* 30: 1, 1918.

the head and was unconscious for five or ten minutes. After he regained consciousness there was an interval of about three hours, during which time he vomited twice and complained of severe headache. He then became restless and irritable.

The attending physician noted that the right pupil was slightly larger than the left and was sluggish in its reaction to light; he made a presumptive diagnosis of hemorrhage of the middle

branches, circulatory changes in the ipsilateral area of supply might also be expected. Infarction was found in three of the six fatal cases.

The second case, presenting late hemorrhage of the middle meningeal artery, first showed an ipsilateral dilated and fixed pupil, and then the contralateral pupil also became dilated and fixed. Although the large clot was removed and the bleeding point controlled, the patient did not recover, and both occipital lobes were found to be infarcted, the ipsilateral to a greater extent than the contralateral.

CASE 2.—E. C., a woman aged 29, referred by Dr. H. P. Macey of Frelighsburg, P. Q., with the diagnosis of hemorrhage of the middle meningeal artery, was brought to the hospital about sixteen hours after her accident. The evening preceding admission she had tripped going downstairs. She was momentarily unconscious and on recovering insisted that she felt no ill effects; after a few minutes she went to bed without assistance. The next morning she was found in deep coma, breathing irregularly, and the right pupil was dilated and fixed. She was transferred to the hospital by ambulance over a distance of 90 miles, and during the journey the left pupil also became dilated and fixed and generalized spasms, suggestive of decerebrate rigidity, occurred periodically.

An emergency operation was performed and a large extradural clot was removed from the right temporal region and the bleeding artery ligated. There was slight improvement immediately after the operation. She did not recover consciousness and died thirty-six hours later. At necropsy there was herniation of the hippocampal gyri over both free edges of the tentorium of the cerebellum. This was more marked on the right side. There were infarcted areas in both occipital lobes, also more marked in the ipsilateral hemisphere.

Hippocampal herniations causing palsy of the third nerve occur not only in head injuries but also in intra-

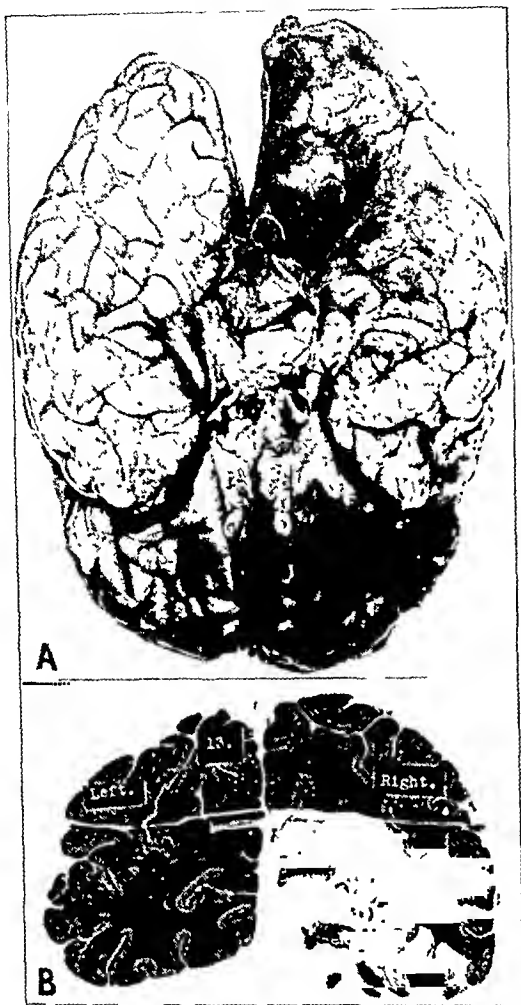


Fig. 2 (case 3).—Infarction of the mesial surface of the right occipital lobe A and B. The herniation of the hippocampal gyrus on the right side is shown in A at X. There was some herniation on the left side as well. There were no hemorrhages in the midbrain.

meningeal artery. On admission to the hospital the patient cooperated with the examiner, although he was dull and resented being disturbed. By this time the right pupil was fully dilated and fixed; there was ptosis of the right upper lid and the extra-ocular muscles supplied by the third nerve were paralyzed.

A right subtemporal decompression was carried out by Dr. Donald Coburn as an emergency procedure and a large extradural hematoma was removed. After operation the signs cleared rapidly. Within five hours the right pupil, although still dilated, reacted to light. The eye movements began to return and the patient complained of diplopia. He made a rapid recovery and on discharge the eye movements were normal but there remained slight ptosis and the right pupil was still slightly larger than the left, although both reacted to light and in accommodation.

The posterior cerebral artery passes lateral to and immediately above the oculomotor nerve, in close relation to the free edge of the tentorium. If the intracranial pressure is great enough to cause herniation sufficient to alter the blood flow in this artery or its

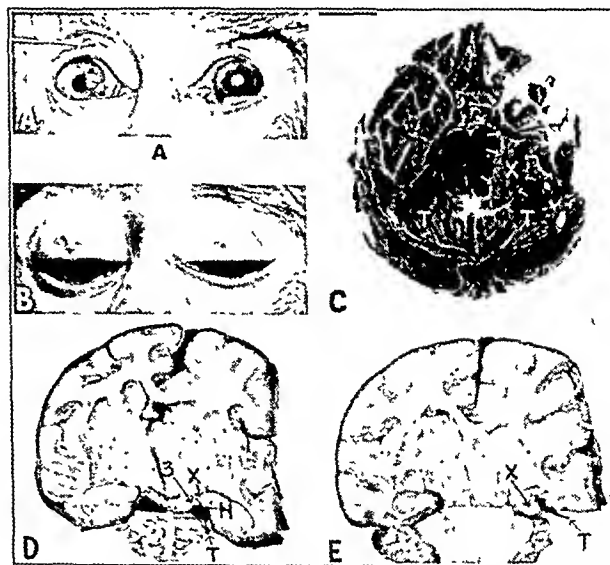


Fig. 3.—Illustrating a typical result in an acute experiment. A, dilatation and fixation of the left pupil and external strabismus of the left eye following ipsilateral extradural compression. B, later stage showing ptosis of the left upper lid. C, herniation of the ipsilateral hippocampal gyrus (X) over the free edge of the tentorium (T). The arrow heads outline the limits of the herniation. D, section showing the hippocampal gyrus (H) herniating over the anterior end of the free edge of the tentorium (T) at the point X, and pressing on the third nerve (3). E, section taken more posteriorly showing the herniation (X) forming a wedge between the free edge of the tentorium (T) and the midbrain.

cranial expanding lesions, and with these herniations the circulatory changes may occur in the areas supplied by the posterior cerebral artery. The following case resembles one described by Meyer:⁶

6 Meyer, Adolf: Herniation of the Brain, Arch. Neurol. & Psychiat. 4: 387 (Oct.) 1920.

CASE 3.—N. D., a man aged 54, was referred by Dr. Philippe Panneton of Montreal as suspected of having an intracranial tumor. For two months the patient had had right frontal headache and had vomited on three or four occasions, and over this period personality changes had developed. He was very uncooperative on admission to the hospital. Early bilateral papilledema was present and there was a slight weakness of the left lower part of the face and some awkwardness of the left

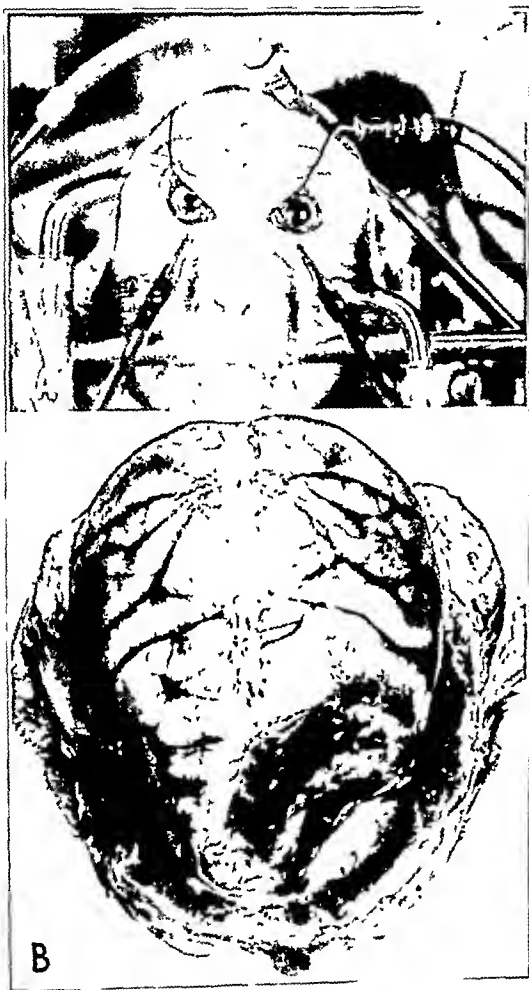


Fig. 4—The result in an experiment of acute compression. *A*, animal under anesthesia with head in Gage head holder and Forbes window in place. *A*, as a result of extradural compression on the left side, the left pupil is dilated. *B*, dissection to show the site of and the deformity caused by the compression in this animal.

hand. A presumptive diagnosis of a right frontal expanding lesion was made. During the evening prior to the day planned for operation he was given an enema. As he was expelling this he fell back unconscious, and the right pupil gradually dilated and became fixed.

Operation was performed as an emergency measure about two hours after the pupil became dilated and fixed, and a compact mass composed of four heavily encapsulated abscesses was removed *en bloc* from the inferior portion of the right frontal lobe. Although there was slight general improvement following operation, the patient did not recover consciousness, and he died on the fifth postoperative day. During the postoperative period the right pupil remained semidilated, and it was noted that the right eye did not move as freely as the left.

At necropsy there was herniation of both hippocampal gyri over the free edges of the tentorium cerebelli. This was more marked on the right side, and the right oculomotor nerve was discolored at the point of compression. There was an area of infarction in the medial aspect of the right occipital lobe. In spite of the fact that one of the abscesses was opened and evacuated at the time of the operation, there was no evidence of meningitis or infection of the wound.

The extradural compression in the experimental acute herniations was obtained through the use of a Forbes window screwed tightly into a trephine hole in the skull, the position of which varied in different animals between the frontal, parietal and temporal regions. After the dura had been separated from the calvarium for a short distance around the trephine hole, Ringer's solution was allowed to flow in, and the pressure exerted could be altered and recorded at all times. The animals were under light dial anesthesia with the head held in the Gage head holder.

It was possible to produce at will ipsilateral pupillary dilatation and to watch the pupil return to normal on release of the pressure. After the pressure had been kept at a level sufficiently high to hold the pupil in complete dilatation and fixation, the animals were killed. Ipsilateral hippocampal herniation was found as a routine at necropsy. The herniation was great in



Fig. 5—A typical result in an experiment in chronic compression (experiment 2). *A*, dilated and fixed pupil in the conscious animal, the result of ipsilateral cerebral compression. *B*, dilated and fixed pupil and ptosis at a later period when pressure had become greater. *C*, dissection with accurate tracing below showing the artificial extradural expanding lesion (*S*), the herniation (*X*) of the hippocampal gyrus (*H*) over the free edge of the tentorium (*T*). More anteriorly the herniation was pressing on the third nerve (*3*).

the animals showing marked pupillary change and less extreme in those showing lesser degrees of involvement of the third nerve. The following is a representative result of an experiment in acute compression:

EXPERIMENT 1.—A trephine hole was made in the left frontoparietal region and the Forbes window screwed in (fig. 4). The extradural pressure was started at 40 mm. of mercury and gradually raised to 90 mm. of mercury during the next hour. Three and one-half hours after the experiment was started the ipsilateral pupil began to dilate and soon became fully dilated and fixed. Whenever the pressure was lowered the pupil rapidly returned to normal and again dilated when the pressure was increased. This procedure was carried out many times with the same result. The pressure was then kept at 90 mm. of mercury for eight hours, at the end of which time the animal was killed. At necropsy a herniation of the hippocampal gyrus was found over the anterior end of the tentorium pressing on the third nerve.

In order to produce chronic extradural compression that would be progressive, the dura was stripped from the calvarium and a hygroscopic material, either recently moistened saraka seeds or gum tragacanth, was packed between the bone and the dura. The trephine opening was then closed by screwing a tight-fitting, threaded, flat metal disk into it. The scalp was sutured and the animal, after recovering from the anesthetic, was carefully observed. Again, when ipsilateral dilatation was present, hippocampal herniation was found and the degree of palsy of the third nerve was dependent on the amount of herniation present. In none of the experimental animals did we find infarctions or hemorrhages. The first signs of dilatation of the pupil developed in these animals in the group with chronic compression from seven to thirty-six hours after the extradural compression was started. The animal in experiment 2 showed the first pupillary changes twenty-six hours after operation.

EXPERIMENT 2.—The dura was stripped around a trephine hole over the left temporoparietal region and saraka seeds were packed into the space made (fig. 5). During the next twenty-four hours the left pupil varied in size and was erratic in its reaction. At twenty-six hours it had begun to dilate and at thirty-four hours it was fully dilated and fixed, and there was ptosis of the left upper lid. The animal died at the end of forty-nine hours and at necropsy there was a marked herniation of the ipsilateral hippocampal gyrus over the free edge of the tentorium. This herniation was pressing firmly on the third nerve and by displacing the midbrain to the right it had put the nerve on the stretch.

COMMENT

From a study of ten patients with unilateral expanding cerebral lesions, eight of these at autopsy and ten experiments on monkeys, we have concluded that herniation of the hippocampal gyrus over the free edge of the tentorium by its pressure on the third nerve as it crosses the greater wing of the sphenoid bone can cause paresis or complete paralysis of this nerve. As evidence of the amount of pressure which the herniation is capable of producing, we have cited the interference with circulation through the posterior cerebral artery with resulting infarction of the brain in the area supplied by it.

We recognize and have studied some of the other pathologic alterations that are associated with herniations through the incisura tentorii; ipsilateral hemiplegia reported by Kernohan and Woltman⁷ and by Hoen⁸ and midbrain hemorrhage,⁹ conditions which

were not present in the cases under discussion and were not produced in our experiments.

From the literature and in discussion with others, many valuable suggestions have been obtained, shaping our work and influencing the conclusions. Our experiments, it seems to us, are more precise and the results more conclusive than those reported by Hoessly,⁵ Meyer⁶ and Vincent, David and Thiebaut¹⁰ have made hippocampal herniations familiar, but they have not pointed out the associated involvement of the third nerve that has been such a striking feature in the cases and experiments we report. Mr. Geoffrey Jefferson of Manchester, England, in a verbal communication stated that he had reached the conclusion that pupillary dilatation in ipsilateral expanding cerebral lesions was due to pressure on the third nerve by the herniated gyrus and that he had removed the gyrus and had seen palsy of the third nerve clear postoperatively.

With the herniation there is distortion of the midbrain, and the question arises as to whether or not disorders of the third nerve could result from nuclear disturbances. The work of Magoun, Atlas, Hare and Ranson¹¹ and of Crouch¹² has helped to localize the site of the lesion. The former group of investigators obtained bilateral pupillary constriction on stimulation of points around the central gray matter of the midbrain up to the nucleus of the third nerve, but ipsilateral pupillary constriction was obtained only when they stimulated points peripheral to the nucleus. From this they concluded that there was a final partial decussation of pupillary reflex fibers in the immediate vicinity of the nucleus of the third nerve. Crouch¹² showed that each third nerve receives the majority of its fibers from the nucleus of the same side but that it receives also a certain number of fibers from the opposite nucleus. From the evidence produced by these investigators it is clear that a lesion causing one dilated and fixed pupil must lie peripheral to the nucleus and the absence of other midbrain signs would place it in the peripheral part of the third nerve. Each clinical and experimental case that we have included has presented such a lesion in the form of a herniated hippocampal gyrus pressing on the third nerve. In some of our cases the nerve was flattened or stretched and in one instance discolored.

The amount of pressure necessary to produce the herniation in the normal animal may give some idea of the pressure in cases in human beings when these herniations occur. In some of the animals it was almost as high as the systolic blood pressure, and this may aid in the explanation of the infarctions that occur in cases in man. Thus, from the clinical standpoint, when ipsilateral fixed dilatation of the pupil is present, the situation is a very grave one. If the mechanism causing the herniation is allowed to continue to act or even if the herniation is not removed after the primary expanding lesion is corrected, cerebral infarctions, pontile hemorrhages, damage to the contralateral peduncle, distortion of the midbrain and aqueduct block may occur.

Why all cases in which death is caused by increased intracranial pressure due to a supratentorial expanding

7. Kernohan, J. W., and Woltman, H. W.: Incisura of the Crus Due to Contralateral Brain Tumor, *Arch. Neurol. & Psychiat.* 21: 274 (Feb.) 1929.

8. Hoen, T. J.: Hémiplégie homolatérale avec lésions intracrâniennes, *Bull. Assoc. de méd. de langue française* 1: 353, 1935.

9. Moore, M. T., and Stern, Karl: Vascular Lesions in the Brain-Stem and Occipital Lobe Occurring in Association with Brain Tumours, *Brain* 61: 70-98 (March) 1938.

10. Vincent, C.; David, M., and Thiebaut, F.: Le cône de pression temporal dans les tumeurs des hémisphères cérébraux: Sa symptomatologie; sa gravité; les traitements qu'il convient de lui opposer, *Rev. neurol.* 65: 536 (March) 1936.

11. Magoun, H. W.; Atlas, D.; Hare, W. K., and Ranson, S. W.: The Afferent Path of the Pupillary Light Reflex in the Monkey, *Brain* 59: 234 (June) 1936.

12. Crouch, R. L.: The Efferent Fibers of the Edinger-Westphal Nucleus, *J. Comp. Neurol.* 64: 365 (Oct.) 1936.

lesion do not show herniation as a routine and one or even all of the complications which can result, we cannot say. Since we have become more familiar with the condition at the autopsy table and have been more on the alert for the clinical manifestations, both its clinical recognition, as the result of close watch of the dying patient, and its postmortem occurrence have been more frequently recorded.

CONCLUSIONS

Herniation of the hippocampal gyrus over the free edge of the tentorium due to an ipsilateral expanding cerebral lesion can cause pressure on the third nerve as it crosses the body of the sphenoid bone sufficient to paralyze this nerve partially or completely. The dilated and fixed pupil usually is the earliest clinical sign of the herniation. The involvement of the third nerve, however, may be but one of the manifestations of the herniation. It is a danger sign not only in intracerebral space-occupying lesions but in extradural and subdural ones as well. It is emphasized in this paper because, if its significance is appreciated early, treatment may prevent the other complications.

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THE INCIDENCE OF MAJOR ALLERGIC DISEASES IN COLORADO SPRINGS

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A survey of the city of Colorado Springs with regard to the incidence of the major allergic diseases was undertaken during the last twelve months. The general impression among the physicians of this city during the last few years has been that there was a decided increase in the prevalence of hay fever and asthma. Colorado Springs and its environs have long been a mecca for health seekers. This community is widely noted for its beautiful and comfortable homes, broad clean streets, supervised play grounds and well developed public utilities. It is a center of culture, education and recreation, as distinguished from a community characterized primarily by industrial, commercial or service factors.

The population is to a large extent native born, the chief foreign groups being English, German and Canadian. There is more than the average preponderance of females over males and a larger proportion of persons in the later age groups than is characteristic of the United States as a whole.

The climate is moderately cool, with low precipitation, low humidity and a high percentage of sunshine. The mean average temperature over a fourteen year period was 48.1 F. The mean relative humidity was 46.78 per cent, and there were 13.2 inches of precipitation and 60.6 per cent of sunshine.

The city has a population of 35,000 and is situated at the foothills of the Rampart range of the Rocky Mountains at an elevation of 6,000 feet above sea level. A botanic survey of this region with the pollination periods has been previously published.¹

On the advice of the director of the Cowles Commission for Economic Research, the city was divided into

five economic districts. This was done in order to obtain the most accurate cross section of the population. The districts selected gave about equal numbers of persons in each economic group. The survey was conducted through a house to house canvass by two men from the department of biology at Colorado College whom I trained. Whenever a questionable case was encountered I investigated it.

The investigation related to the occurrence of major allergies in the general population. The minor allergies, in which the subject had recognized an allergic reaction to a specific substance with which he came in contact only occasionally, were not tabulated. The persons with minor allergies had not found it necessary to seek medical relief for their symptoms, since by avoiding the specific substances they were able to obtain complete relief. All persons with major allergies had found it necessary to seek medical relief, although in many cases a complete diagnostic allergic study had not been undertaken.

The major allergic conditions investigated were grouped under the headings hay fever, asthma, eczema, migraine, urticaria and gastrointestinal allergy. One thousand families were investigated, 200 from each of the five economic districts. These comprised a total of 3,141 persons. In reviewing the available medical literature on the incidence of allergic diseases in the United States, Coca² estimated the incidence of hay fever to be less than 1 per cent in the general population. Scheppegegrell³ concluded that about 1.5 per cent of the general population suffered from hay fever. Cooke and Spain⁴ said that from 3 to 5 per cent of the population of New York and its vicinity had hay fever and asthma. Piness and Miller⁵ reported a study on two controlled communities; the incidence of hay fever was 4.4 per cent in one and was estimated at between 3 and 4 per cent in the other, although only 1.5 per cent of the population presented themselves for treatment. Cooke and Vander Vere⁶ reported about 7 per cent of the population suffering from hypersensitiveness, including even the minor degrees of sensitization. Jimenez⁷ reported that 11.9 per cent of the incoming students at the University of Michigan have had eczema, hay fever or asthma. An additional 22 per cent presented a history of allergic manifestations accompanied by a family history of sensitization. Rowe⁸ reported that of 400 university students 35 per cent had a personal history of probable allergy. Vaughan⁹ reported that upward of 10 per cent of the population have major allergic manifestations, usually subacute or chronic, and approximately 50 per cent give a history of minor episodic allergic manifestations. Pipes¹⁰ reported that approximately 13 per cent of the population are subject to major allergic manifestations and that 36 per cent describe minor allergic reactions. Because of the discrepancies in the reports encountered in the literature and a belief that a survey of a

2. Coca, Arthur F.: *Walzer, Mathew, and Thommen, August A.: Asthma and Hay Fever in Theory and Practice*, Springfield, Ill., Charles C. Thomas, Publisher, 1931.
3. Scheppegegrell, William: *Hay Fever and Asthma*, Philadelphia, Lea & Febiger, 1922.
4. Spain, W. C., and Cooke, Robert A.: *J. Immunol.* 9: 521 (Nov.) 1924.
5. Piness, George, and Miller, Hyman: *J. Allergy* 1: 117 (Jan.) 1930.
6. Cooke, Robert A., and Vander Vere, H., Jr.: *J. Immunol.* 1: 201 (June) 1916.
7. Jimenez, B.: *J. Michigan M. Soc.* 33: 310 (June) 1934.
8. Rowe, Albert H.: *Food Allergy*, Philadelphia, Lea & Febiger, 1933.
9. Vaughan, Warren T.: *J. Allergy* 3: 184 (Jan.) 1934.
10. Pipes, David M.: *South. M. J.* 30: 1012-1015 (Oct.) 1937.

Read before the Association for the Study of Allergy, San Francisco, June 10, 1938.
1. Service, W. C.: *Hay Fever Flora of the Pikes Peak Region*, Colorado Med. 31: 311 (Sept.) 1934.

larger number of cases would justify more definite conclusions, this survey of Colorado Springs was undertaken.

SURVEY

One thousand families were investigated, and 505, or 50.5 per cent, had one or more members who evidenced major allergic manifestations. Among the 3,141 persons interviewed 711, or 22.6 per cent, presented 842 major allergic manifestations, approximately 16 per cent showing more than one. A series of studies was carried out in each of the six groups.

Hay Fever.—Of the 3,141 persons interviewed, 316 had hay fever. This is an incidence of 10.06 per cent for hay fever in the general population. Of this number forty-eight, or 15.2 per cent, had had hay fever before coming to Colorado, which leaves 8.5 per cent of the population who acquired it locally. Every person in this group had sought medical treatment for the relief of symptoms. However, only 30 per cent had received adequate allergic diagnosis and treatment. The remaining 70 per cent had sought relief in different ways, including local treatments of the nose, eyes and throat, nonspecific protein injections, cauterization, and mixed pollen injections without tests and without any adequate allergic program. Pollen was given as the cause of the trouble by 89 per cent, epidermals and dust by 3.5 per cent and food by 3.5 per cent; for the remaining 4 per cent the cause was unknown.

The ages of the hay fever patients varied from 1 to 65 years. The distribution according to the age of onset and the duration are reported in table 1 and chart 1.

TABLE 1—Distribution of Hay Fever

Age, Years	No of Cases	Per Cent	Average Age at Onset, Years	Average Duration, Years	Per Cent Duration
0-10	93	31	5.6	14.3	45.5
10-20	63	20	13.4	16.2	30.1
20-30	59	19	24.4	14.0	16.0
30-40	49	15	33.8	12.9	7.0
40-50	23	8	42.9	12.3	1.4
50-60	3	1	52.2	7.6	...
60-70	1	...	65.0	5.0	...

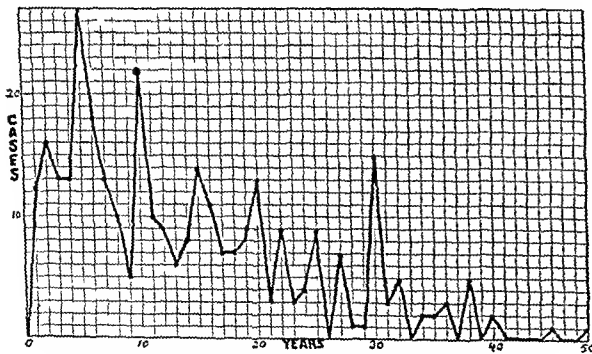


Chart 1—Duration of hay fever.

The figures indicate that hay fever tends to manifest itself in childhood, almost 60 per cent of the patients having acquired the condition before the age of 20. There is a fall in the occurrence and in the duration in each decade. The average duration for each of the ten year periods is practically the same. Of the hay fever sufferers, 58 per cent were males and 42 per cent females.

Asthma.—Among the 3,141 persons investigated 114 had asthma. This represents an incidence of asthma in the general population of 3.6 per cent. Forty-eight had come to Colorado because of asthma. This leaves sixty-six, or 2.1 per cent, with asthma of native origin. Food was given as the cause of asthma by 39 per cent, pollen by 21 per cent, bacteria or infection by 11 per cent and dust or epidermals by 7 per cent; for the

TABLE 2—Distribution of Asthma

Age, Years	No of Cases	Per Cent	Average Age at Onset, Years	Average Duration, Years	Per Cent Duration
0-10	22	26.0	4.6	17.6	43.0
10-20	24	21.2	12.9	19.2	31.6
20-30	27	23.7	22.4	15.4	15.0
30-40	19	16.7	33.2	11.4	4.4
40-50	7	6.1	44.0	15.7	2.5
50-60	3	2.6	52.7	14.3	2.5
60-70	2	1.7	67.1	7.0	1.0

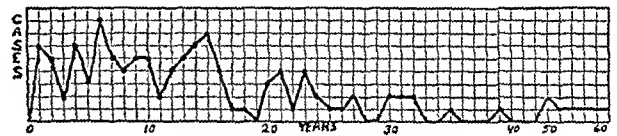


Chart 2—Duration of asthma.

remaining 22 per cent the cause was not definitely known. All the subjects had sought medical diagnosis and treatment, although less than 30 per cent had received specific allergic diagnosis and treatment. In table 2 and chart 2 their cases are summarized as to the age at onset and the duration.

An analysis of the asthmatic group reveals that asthma is most prone to develop in the first three decades, over 80 per cent of the subjects having had it before the thirtieth year. The average duration is a little higher in the asthmatic group than in the hay fever group. There is a decline in the duration of the disease in each decade. Fifty-one per cent of the subjects were males and 49 per cent females.

Migraine.—One hundred and sixteen persons had migraine considered to be allergic in origin. In this group it was necessary to exercise considerable care in selecting the cases. Approximately 15 per cent of the subjects had been observed in the office. The remaining 85 per cent either had other allergic manifestations or presented a strong family history of migraine. Seventy-one per cent were aware that specific foods would either precipitate or aggravate an attack, although the known specific substances were not entirely responsible for the symptoms. The remaining 29 per cent were convinced that food was a factor in causing their migraine. These 116 subjects represent approximately 3.7 per cent of the general population. Twenty-one, or 0.7 per cent, had migraine before coming to Colorado, so that 3 per cent had acquired an allergy in residence. Their cases are summarized in table 3 and chart 3 according to age and the duration of the condition.

The figures indicate that migraine is most prone to develop in the second, third and fourth decades. The average duration of this condition was found to be considerably longer in persons in whom it developed between the ages of 10 and 20, although 43 per cent of the subjects were found to have had it for less than ten years and approximately 75 per cent for less than twenty years. Of the subjects 68 per cent were females and 32 per cent males.

Eczema.—Ninety-one persons had eczema of allergic origin, an incidence of 2.9 per cent in the population at large. Twelve had eczema before coming to Colorado, so that the incidence of eczema of native origin was 2.5 per cent. Food was either known or considered to be a factor with all but seven for whom pollen was

TABLE 3—Distribution of Migraine

Age, Years	No. of Cases	Per Cent	Average Age at Onset, Years	Average Duration, Years	Per Cent Duration
0-10..	8	7.0	7.7	13.1	48.3
10-20.	32	27.6	11.2	22.0	25.0
20-30.	27	23.3	22.8	14.8	18.1
30-40..	33	28.1	34.2	9.0	4.3
40-50..	12	10.3	46.2	8.7	4.3
50-60..	4	3.4	51.2	12.0	....

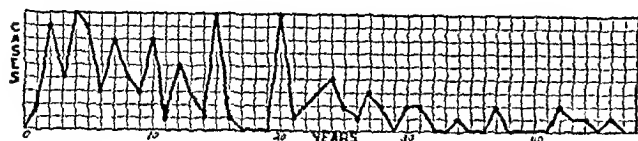


Chart 3—Duration of migraine

found to be the cause. Twenty-two per cent had been studied from an allergic standpoint, with adequate food tests, and practically all were children under 5 years of age. Forty-one per cent were males and 59 per cent females. A large percentage had received local treatment, either by a dermatologist or under the direction of their own physician, and usually the history revealed that the patient improved under local treatment for a time, only to suffer an exacerbation as soon as it was discontinued. Older subjects frequently gave a history of childhood eczema. Eczema was frequently associated with other allergic conditions. The ages at onset and the duration are reported in table 4 and chart 4.

In 56 per cent of the subjects eczema had developed in childhood, and in 71 per cent it had had a duration

TABLE 4—Distribution of Eczema

Age, Year-	No. of Cases	Per Cent	Average Age at Onset, Years	Average Duration, Years	Per Cent Duration
0-10..	51	56.0	3.8	9.9	71.5
10-20.	14	15.4	14.3	6.0	16.4
20-30.	10	11.0	22.7	12.3	8.8
30-40.	7	7.7	32.7	8.0	2.2
40-50..	5	5.5	45.0	6.6	1.1
50-60.	4	4.4	52.5	7.5	.

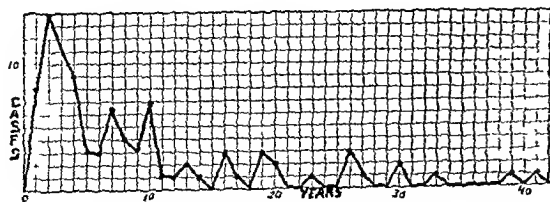


Chart 4—Duration of eczema

of less than ten years. There is a progressive decline in each decade in the percentage of patients acquiring eczema. The average duration of eczema in every age group except one was less than ten years. However, in going over the individual histories it was found that the duration varied from a few months to forty-one years. This group of subjects, I feel, represents the

minimum number of persons with eczema of allergic origin in the general population.

Urticaria.—The fifth group is composed of patients presenting either urticaria or angioneurotic edema. None with minor allergy are included. It was very striking the number of times that urticaria was encountered as a minor allergy. Almost 100 per cent of the persons having urticaria as a major allergy were aware of specific foods that would produce their symptoms, so that almost all those with major allergies also suffered from minor allergies. This group is composed of 103 subjects, the incidence thus being 3.2 per cent in the general population. Of these, 2.5 per cent had urticaria of native origin and 0.7 per cent had had their symptoms before coming to Colorado. Their cases are summarized in table 5 and chart 5.

Almost 50 per cent of the subjects had acquired urticaria in the first decade, and the average duration of the condition was under six years. These children

TABLE 5—Distribution of Urticaria

Age, Year-	No. of Cases	Per Cent	Average Age at Onset, Years	Average Duration, Years	Per Cent Duration
0-10..	48	46.6	5.2	6.6	67.9
10-20.	28	27.2	13.3	15.0	19.5
20-30.	12	11.6	21.2	12.7	9.7
30-40.	11	10.6	33.0	10.3	2.9
40-50..	4	4.0	43.5	14.2	.
50-60.	.	.	.	.	.

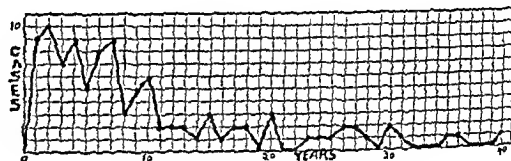


Chart 5—Duration of urticaria

did not have just an occasional rash; the attacks would usually last several weeks, and in the intervals between exacerbations as a rule they would not be completely free. Approximately 20 per cent had received allergic diagnosis and treatment. Food was listed as the predominant cause in every case. In ninety-two cases it was given as the only factor involved; in three cases epidermals and foods were blamed, and in eight the cause was listed as unknown although the patient suspected that food was a factor. Sixty-two per cent of the group were females and 38 per cent males.

Gastrointestinal Allergy.—Without exception food was given as the cause of this condition. None of the persons in whom inhalants were found to cause symptoms are included, although a few were encountered among the persons with hay fever. All the subjects could name one or more foods that would precipitate the symptoms, but the elimination of the known substances was not sufficient to relieve the condition. With children in the first decade, the parents were able to eliminate one or more foods from the diet because symptoms would follow their ingestion. This group is composed of 106 persons, the incidence in the general population thus being 3.3 per cent. Their cases are summarized in table 6 and chart 6.

Heredity.—The influence of heredity in allergic diseases has been the subject of investigation by a great many writers. The tendency to become hypersensitive

may be transmitted from the mother, from the father or from both parents. In this survey it was found that a history of major allergy in the first degree (father, mother, brother, sister) was obtained in 16.2 per cent of the cases from the maternal side, in 10.3 per cent of the cases from the paternal side and in 4.6 per cent of the cases from both sides. This gives a total incidence of the inheritance factor of 35.7 per cent. If the inheritance was transmitted from parent to child as a dominant mendelian characteristic, one would expect to find an inheritance factor of 50 per cent in the case of unilateral inheritance and of 75 per cent in the case of bilateral inheritance. If a comprehensive survey was to be made which would include the history of both major and minor allergy as inheritance factors, I feel certain that a factor considerably higher than 35.7 per cent would be obtained for the parents. An analysis of the 2,430 nonallergic persons showed an allergic heredity for 9.3 per cent.

COMMENT

This survey indicates that major allergy is manifested by over one fifth of the general population, and, if one combines this result with the results of Vaughan⁹ and Pipes¹⁰ on the occurrence of minor allergy, it is evident that at least three fourths of the population manifest allergy to a greater or lesser degree. Allergy then, as has been pointed out, is no longer the exception but the rule.

It will be noted that in this series the duration of allergy in each of the age groups was usually between ten and fourteen years. The duration was considerably less in cases of adequate diagnosis and treatment than in those of inadequate treatment.

In the cases of food allergy the frequency with which the elimination diet had been used was noted. Some of the patients could alleviate their symptoms by its use but as a rule it was ineffective in greatly relieving the condition. The fact that persons with major allergies

TABLE 6.—Distribution of Gastrointestinal Allergy

Age, Years	No. of Cases	Per Cent	Average Age at Onset, Years	Average Duration, Years	Per Cent Duration
0-10.....	27	25.5	4.4	14.7	42.4
10-20.....	15	14.1	14.0	13.5	36.0
20-30.....	28	26.6	23.8	12.9	14.1
30-40.....	19	18.0	33.7	12.3	7.5
40-50.....	12	11.3	43.6	11.7	....
50-60.....	5	4.7	54.0	14.2	....

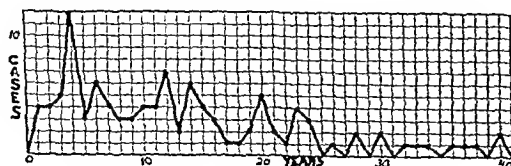


Chart 6.—Duration of gastrointestinal allergy.

are usually sensitized to a number of foods and do not manifest an immediate reaction argues against the effectiveness and reliability of the elimination diet in major allergy.

This survey revealed that 35.7 per cent of the allergic subjects had a family history of major allergy, while of the nonallergic subjects only 9.3 per cent had such a history. Vaughan⁹ has hypothesized that the natural

tendency of allergy is toward recovery, toward a gradual loss of sensitization. Perhaps this will be borne out by future reports; however, present reports indicate that major allergy is becoming more frequent in the general population. The various allergies when classified by age groups appear to have a limitation as to duration, and certainly with treatment the tendency is toward recovery.

CONCLUSIONS

1. A survey of the city of Colorado Springs reveals that 22.6 per cent of the general population have one or more major allergic manifestations.

2. The incidence of hay fever was 10.06 per cent, of asthma 3.6 per cent, of eczema 2.9 per cent, of migraine 3.7 per cent, of urticaria 3.2 per cent and of gastrointestinal allergy 3.3 per cent.

3. A positive family history of major allergy was obtained for 35.7 per cent of the subjects with major allergy and for 9.3 per cent of the nonallergic subjects.

4. Approximately 16 per cent of the allergic persons presented more than one major allergic manifestation.

THE LEVER AT THE TOP OF THE FEMUR AND ITS SURGICAL ELONGATION

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If one were to inquire of the average practitioner the function of the olecranon process at the elbow, I am certain one would in a large percentage of instances receive essentially the correct answer, namely that active extension of the elbow joint is produced from the pull of the triceps muscle on this lever acting purely as a lever. I feel that there would be little confusion as to the importance of the leverage of the olecranon process in the movements of the elbow and arm. The influence of function on the lever at the top of the femur (head-neck-great trochanter) is of equal importance and identical in mechanical principle with that of the olecranon process, and yet few practitioners specializing in surgery of the joints have appreciated the importance of this action and its tremendous influence on the structure and function of the hip joint; at least no suggestions have ever been made to modify its length surgically when the necessity was evident.

In a newly surgically made hip joint a postoperative dislocation may occur because of the inadequate length of this lever. The pelvis may tip upward or the femur pull inward in adduction, with varying resultant practical shortening of the limb, or weight-bearing weakness with marked limp. Such limp has often been mistaken for that of shortening of the limb, and many patients have been brought to me with a request that the limb be lengthened when there was little or no actual bony shortening.

The contrast in favor of the importance of the lever at the top of the femur is even greater, in that the olecranon process functions only to enable active extension whereas the lever at the top of the femur not only is the essential element in providing a mechanism for abduction and inward and outward rotation of the lower limb at the hip but is essential to the stabilization of the

hip joint and the active control of the weight-bearing relation between the femur and the pelvis. One muscle is inserted into the olecranon process and seven are inserted into the outer end of the lever at the top of the femur, namely the gluteus medius, gluteus minimus, obturator externus, piriformis, gemellus superior, obturator internus and gemellus inferior.

With the sole exception of adduction, all movements at the tip have to do to a greater or less degree with the pull of certain muscles on the outer end of this lever.

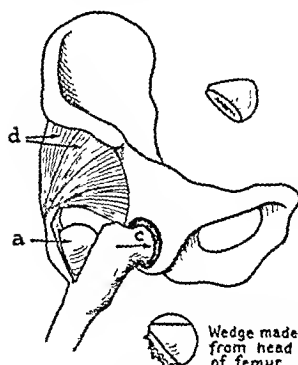


Fig. 1.—Method of elongating the lever at the top of the femur in cases of ununited fracture of the neck of the femur in which much absorption of bone has occurred because of an inadequate blood supply. The removed femoral head is transformed into a wedge and placed at *a*. It serves three purposes: (1) it holds the newly formed head firmly in the acetabulum at *c* and prevents dislocation; (2) it restores active weight bearing, and (3) it restores abduction by providing a longer lever for the gluteal muscles (*d*) to pull on.

In industry or in everyday life, if the force available to be directed on the end of a lever is inadequate and it cannot be increased, the only recourse is to elongate the lever so that the same available force will be adequate to the lifting of the corner of a building or a rock. This principle I have applied in the case of both the olecranon process and the lever at the top of the femur. That is, I have lengthened these structures to the anatomic dimension when they have been shortened by disease, by trauma or by inadequate development. In such instances it is assumed that the muscular force is

physiologically normal. On the other hand, when the muscular forces which normally activate these levers have been weakened from any cause whatever, particularly infantile paralysis, it follows by the same token that the elongation of these lever structures beyond their anatomic normal dimension is equally indicated. The results obtained by such surgical procedures have been most gratifying. This principle was first applied by me over twenty years ago to ununited fractures of the neck of the femur with extensive absorption of bone in my so-called reconstruction operation (fig. 1).

A shell of bone about $3\frac{1}{2}$ inches long obtained from the superior and outer surface of the great trochanter is turned outward with the muscle insertions undisturbed, and into the crotch thus made fragmented grafts are packed, the purpose being to afford a longer lever for these muscles to pull on, thus preventing post-operative dislocation and restoring abduction and active weight bearing.

Other conditions for which this technic has been applied are shortening of the neck of the femur from destructive lesions such as tuberculosis, when the disease has been cured, leaving marked shortening of the neck of the femur, and old reduced congenital dislocation of the hip with the same result. In many cases there have been marked adduction deformities with resultant practical shortening, and particularly in the case of the healed tuberculous hip the teaching has been in the past either to correct the adduction by Gant's osteotomy or to correct it at the hip joint, with a supplementary fusion operation. In most instances the latter destructive operation, with loss of motion, was found necessary because repeatedly the adduction would slowly recur. The reasons why this was so have not been

explained. The outstanding feature of these cases has been the shortening of the lever at the top of the femur. The adductor muscles function with their normal mechanical advantage at the same time that their antagonistic muscles are markedly handicapped in that they are pulling on a bony lever which may be less than one half its anatomic length. Is it surprising, under these conditions, that the correction of an adduction deformity by osteotomy at the lesser trochanter should recur? The indications as I see them now in such cases are to correct the deformity and then restore the abductor bone lever to its normal dimension or even to greater length. With some of these conditions, either of congenital or of pathologic origin, there has remained a bone block at the superior periphery of the hip joint which had to be removed when the lever was lengthened in order to allow freedom of motion of the hip joint.

Another important indication for surgical reconstruction occurs in cases of arthroplasty to restore motion to a bony stiff hip joint when this lever has been shortened both by the destructive lesion which produced the ankylosis and by the necessary removal of bone by the surgeon in modeling the new joint. In this instance, in the discretion of the surgeon, the lever may be lengthened at the primary arthroplastic operation to restore motion, or this procedure may be deferred to a later date. In borderline cases in which there is doubt as to whether the lever is sufficiently long it is urged that the secondary procedure be deferred until the defective function of the joint proves this necessity.

My last application of this kinesiological principle has been demonstrated in cases of infantile paralysis in which there has been a weakening of the group of muscles attached to the tip and outside of the great trochanter. In this instance one would immediately reason that the lever is of normal physiologic length, but this has not been found to be the case at all. The weakening of the trochanter muscles has resulted, as one might expect, in the general lack of development of the whole upper end of the femur, and this has caused a diminution in the longitudinal dimensions of this lever. Therefore the indications for its elongation are double; namely, the muscular force which activates it has been lessened below functional capacity, and at the same time the lever has become shortened. The surgical

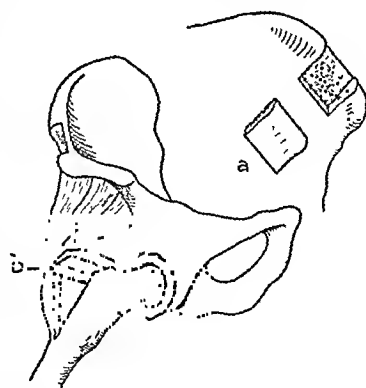


Fig. 2.—Method of elongating the lever at the top of the femur in cases of weakness of the abductor or weight-bearing muscles, whether from infantile paralysis or other cause. A rectangular graft is obtained from the outer crest of the ilium, including as much of the outer table of the ilium as is found desirable (*a*). This is placed at *b* and firmly holds the bony structures in the elongated position. Care should be taken in freeing the top and outer portion of the great trochanter not to sever or unnecessarily damage any of the short trochanteric muscles.

results from reconstructing this lever, as might be anticipated, have in many cases been brilliant.

TECHNIC

1. For many years following the introduction of my reconstruction operation of the neck of the femur, described in 1919, I have devoted myself intensively to

the development of the simplest surgical technic for all occasions in lengthening this lever. The availability of bone graft material is almost a determining element in the design of the special technic. The object is to have a massive graft which not only will serve eventually to fuse in place and reconstruct the lever but will immediately elongate the lever by its mass support. In the instance of ununited fracture of the neck of the femur, the removed head of the femur serves this purpose admirably. Formerly I always threw this away and used numerous small fragmented bone grafts, but during the past ten years or more I have been able to shape it quickly into the form of a wedge, using a motor saw and osteotome for this purpose. This massive wedge, when properly placed, immediately supports the lever in its elongated state and serves forthwith to prevent the dislocation of the newly formed femoral head from the acetabulum. Because of its extensive mass, it allows ample leeway in shaping a wedge of the desired size, and only three weeks of postoperative immobilization has been necessary. Because of this, free motion of the joint is much more easily restored. When fragmented grafts were used, it was even necessary to immobilize by double plaster of paris spica cast for a long period, at least eight weeks, in order to allow time for the grafts to unite firmly and consolidate the new lever, so that postoperative dislocation of the newly made hip joint would not occur (fig. 1).

2. In cases of shortening of the neck of the femur from ancient cured disease, from congenital malformation or from former arthroplasty in which this lever has been shortened, both by the destructive lesion that produced the osseous tuberculosis and by the removal of bone by the surgeon made necessary in modeling a new joint, the bone graft material can be obtained from the side of the ilium, always high up at the crest so as not to disturb either the muscular structure or its elevation. It can also be obtained from the anterior internal surface of the tibia, the most satisfactory store house of bone graft material. At the discretion of the surgeon this lever may be elongated during the primary operation to produce motion in a bony stiff joint. In this instance the side of the ilium has been already laid bare and therefore the material for the elongation of the lever can be easily obtained.

Formerly I obtained the grafts from the side and crest of the ilium in the form of two "pieces of pie" (segments of a circle) consisting of the outer half of the crest and the outer iliac table, of proper shape and size to fill in the bony wedge cavity which is produced by the turning out of the shell bone from the tip and side of the great trochanter. These may be fastened together with a bone graft peg.

The technic, however, which I employ at present is to obtain the graft in the shape of a square or a rectangle from the outer table of the ilium, including the outer half of the crest. This is placed in accordance with and immediately supports firmly the lever in the elongated state (fig. 2).

The technic in cases of infantile paralysis is precisely the same. However, one caution should be firmly adhered to; that is, if the graft is obtained from the outer surface of the ilium it should be from the extreme upper anterior border, including a portion of the crest, so that the weakened muscles will not be disturbed more than is absolutely necessary.

Clinical Notes, Suggestions and New Instruments

AN IMPROVED METHOD OF APPLYING MOIST HEAT TO INFECTED EXTREMITIES

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It is customary in the treatment of infections of the extremities to utilize the beneficial effects of moist heat. The routine at St. Luke's Hospital has consisted in wrapping the arm or leg in double folded blankets which have been heated in the steam sterilizer, encasing them with a sheet of oiled silk and wrapping both with a bath towel. The blanket is applied at the highest temperature that the patient can tolerate and is allowed to remain for two hours. Thus in the application of continuous moist heat the fomentations are changed by the nurses from eight to twelve times a day.

For several reasons this method, which is not unlike that used in many other hospitals, is inconvenient and impractical and, as will be shown, fails to maintain an atmosphere of moist heat for more than a fraction of the total time applied. More specifically, it is next to impossible for the nursing staff to maintain the two hour schedule of changing the fomentations on the busy surgical floors. It is also common to find the bedding around the foment soaked after several changes, owing to the fact that the oiled silk becomes cracked with use and also because of the haphazard method of wrapping. In practice it was observed that the constant changing of the fomentations defeated the attempts at immobilization of the infected extremity, a factor considered most important in the therapy of infections. But most important of all the objections was that voiced by numerous patients, particularly by members of the staff who at various times have been under treatment for infected hands; namely, that the fomentations failed to keep the part warm for the duration of the application.

To test the validity of some of these observations, temperature recordings were taken on a group of patients by placing a mercury bulb thermometer in the fomentations in such a way as to record the mean temperature of the foment layers. In an attempt to evaluate the results, an arbitrary base line of 100 F. was selected, this temperature being several degrees above the average temperature of the skin and therefore suitable for elevating the temperature of the cutaneous layers and also low enough to obviate burns. The results of our readings have indicated that the routine being used failed to maintain the temperature above the base line for more than from 10 to 15 per cent of the two hour period and that in twenty-four hours of continuous therapy the infected area was actually heated about three hours. At the end of one hour the temperature averaged 93 F., and at the end of two hours 90 F.

An alternative method occasionally used here was then tested out. This consisted in placing a light cradle or electric baker over the fomentations. Readings on a series of four patients receiving repeated fomentations showed that with two 60 watt bulbs the temperature never reached the base line, while with three 60 watt bulbs the temperature could be raised to 100 and no further. Likewise, during each two hour period approximately 25 per cent of the heating effect was lost while the nurse changed the blankets with the cradle removed. The patients complained of aching of the part during the latter part of each treatment when the blanket had dried.

It was then decided that the latter method might be improved by applying the fomentations in a different manner designed to obviate the objections outlined. After several trials the following method was adopted:

The extremity is first covered with petrolatum or preferably with the antiseptic oil used in the nursery. This serves to prevent excess damage of tissue and to hinder the seeding of infection to adjacent hair follicles. The extremity is then wrapped completely around twice with double thickness hot foment blankets. Into the more superior portion of the blankets

are incorporated two rubber tubes perforated at intervals of about 1 inch. These tubes are connected to a 2 foot tube by a Y connection, and the single tube is attached to a funnel strapped to the light cradle. The extremity is arranged so that the proximal part of the tube is higher. The spacing of the perforations and the inclination of the tube serve to distribute the water evenly throughout the foment. Two thicknesses of oiled silk are then wrapped round the blanket and the edges turned on themselves and clipped with large spring paper clips. The ends are carefully folded in to make it water-tight. By means of careful wrapping the bed can be kept dry and comfortable all day. A light cradle is then put over the extremity and covered with a blanket to insulate it against loss of heat.

Temperature recordings taken in more than twenty cases indicate that it is possible to maintain a temperature slightly over 100 F. over long periods of time with one 60 watt bulb. With two 60 watt bulbs temperatures went as high as 112 F. It is inadvisable to use more than 100 watts of energy for fear of burning the patient.

In practice the majority of patients are allowed to moisten their own fomentations as they see fit. Otherwise the nurses pour between 30 and 50 cc. of water into the funnel every hour. The fomentations are changed only as desired for inspection of the infected area. The extremity is therefore immobilized for long periods.

St. Luke's Hospital.

A CASE OF LEAD ENCEPHALOPATHY IN A BREAST-FED INFANT DUE TO THE USE OF LEAD NIPPLE SHIELDS BY THE MOTHER

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Since the report by Wilcox and Caffey in 1926¹ of two cases of lead poisoning in nursing infants due to the use of lead nipple shields by the mothers, the potential danger of these devices as a source of plumbism in the nursing infant has been noted. Although lead poisoning is being recognized with increasing frequency in infancy, being due to the ingestion of paint, the use of lead-containing cosmetics by the nursing mothers (Japan), the burning of storage battery boxes and the like, we have found no cases reported attributable to nipple shields since the report of Wilcox and Caffey.

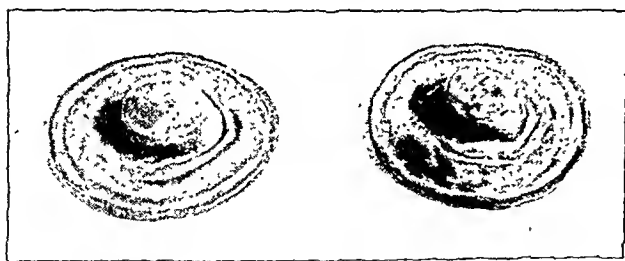


Fig. 1.—Lead nipple shields used by mother of patient.

However, when one considers the fact that the lead nipple shield must be in fairly common use, since it is recommended as a remedy for fissured nipples by many of the standard textbooks of obstetrics,² it is quite possible that there are unrecognized cases of lead poisoning in infants due to the use of such shields.

It is interesting to note that the harmlessness of the lead nipple shield to the infant is stressed in the circular found

in the container of the lead nipple shields sold in this country. This circular read as follows:

Dr. Wansbrough's
CELEBRATED

Metallic Shields

For the Prevention and Cure of SORE NIPPLES

Highly recommended by Dr. Laycock and the most eminent medical men throughout the United Kingdom

The merit of the invention is now so fully understood, and the good results from its application so well established by the experience, both of the Medical Profession, and of numerous Mothers who have been afflicted with Sore Nipples, that the Manufacturer feels he is doing a duty to society by giving as much publicity as possible to a discovery which has proved so great a blessing in these distressing cases.

The attention of the Medical Profession was first drawn to this subject by Dr. WANSBROUGH (the inventor), in a paper published in the *Lancet*, July, 1842; and he afterward brought it before the Society of Arts, in 1843, when he read a paper to that Society entering fully into the nature of the above malady, and the philosophy of this instrument, both as a preventive and a cure.

The following is an extract from the above Paper, which he then delivered and which is published in their transactions:

"Among all the various remedial means that have been proposed for this painfully distressing affection, none have hitherto proved sufficiently effectual, either as a preventive or cure. The subject has occupied the attention of Medical Men for a considerable period, and numerous have been the remedies recommended and applied; but they have failed in the desired result. Now, Gentlemen, this little Apparatus which I have the honor to submit to your notice possesses these great desiderata. As a preventive, it is requisite only to say, that it effectually accomplishes the desired end by being applied immediately after delivery. Its curative character consists in the nipple being immersed in a solution of Lactate of Lead, formed by the Lactic Acid in the milk acting upon the metal; the whole contained in a reservoir, as it were, in the cavity of the Shield, which prevents pressure, and by adhering closely, may be worn with the dress. I have used these Shields in the most severe cases, in a somewhat extensive practice, for upwards of a quarter of a century, even where the Nipple has suppurated and sloughed to the extent of half its volume, threatening the destruction of the whole, AND I HAVE NEVER EXPERIENCED A FAILURE! Yes, Gentlemen, this little, apparently trifling, and intrinsically valueless article, because formed of a material in the lowest scale of metallurgy, possesses, nevertheless, most powerful properties when put to the proof."

DIRECTIONS

For the prevention and cure of Sore Nipples, these Shields should be applied as soon after delivery as possible, and in using them the only attention required is to wipe the Nipple previously to nursing, and apply the Shield again immediately afterwards. They are in no way likely to be injurious to the infant.

Should the edge of the Shield become inverted, it may be instantly restored by being laid on a flat surface, and rubbed round with the finger.

In this report we are presenting the case of a 3½ months old breast-fed infant in whom a severe lead encephalopathy developed as a result of the use of lead nipple shields by his mother.

History.—N. V., a white male infant, aged 3½ months, was admitted to the wards of the Children's Hospital Dec. 19, 1936, with a provisional diagnosis of meningitis.

The family history was inconsequential, the patient being the only offspring of young and healthy Italian parents. He was born in a Philadelphia hospital after an uneventful full term pregnancy and normal labor. The birth weight was 7 pounds 13 ounces (3,545 Gm.).

The past history showed a normal gain of weight until the onset of the illness leading to admission. About one month prior to admission a mild infection of the upper respiratory tract developed, which subsided within a few days. Feeding presented no difficulty, the child having been fed solely on breast feedings every three hours. Orange juice and cod liver oil supplements were added at the age of 1 month and continued in adequate amounts.

The illness leading to admission to the hospital began abruptly on the afternoon of the day prior to entry, being ushered in by projectile vomiting. The vomiting recurred several times that day, and the following morning generalized clonic convulsions developed. He was seen twice that day by a physician, who prescribed for an "upset stomach" and ordered the infant to have two enemas and a mustard bath. His condition remained unchanged, the clonic convulsive seizures recurring at frequent intervals, and between the convulsive episodes he remained tonic and unconscious. He was seen that evening by one of us (M. R.) and a tentative diagnosis of meningitis was made. Following the visit he was referred to the hospital for admission.

From the Department of Pediatrics, University of Pennsylvania School of Medicine, and the Children's Hospital of Philadelphia.

1. Wilcox, H. B., and Caffey, J. P.: *Lead Poisoning in Nursing Infants: Report of Two Cases Due to Use of Lead Nipple Shields*, J. A. M. A. 86: 1514 (May 15) 1926.

2. De Lee, J. B.: *The Principles and Practice of Obstetrics*, ed. 6, Philadelphia, W. B. Saunders Company, 1933, chapter 67, p. 964. Edgar, J. C.: *Practice of Obstetrics*, ed. 6, Philadelphia, P. Blakiston's Son & Co., 1926, part VII, p. 528. Schumann, E. A.: *A Textbook of Obstetrics*, Philadelphia, W. B. Saunders Company, 1936, chapter 39, p. 633.

Physical Examination.—The temperature was 97.8 F., respirations ranged between 48 and 60 and the heart rate was 120.

The patient was well developed and well nourished and weighed 12 pounds 3½ ounces (5,543 Gm.). His length was 55 cm. and the circumferences of his head, chest and abdomen were 40, 41, and 43 cm. respectively. At the time of the examination he was undergoing a generalized clonic convulsive seizure of moderate severity. Breathing was rapid and stertorous. The skin was pale and the extremities were cold and clammy.

The contour of the head was normal. The anterior fontanel was patent and tense but not bulging. There was no retraction of the head, and no definite nuchal rigidity was present. Tonic reflexes of the neck were elicited.

Pandy's reagent showed a moderate increase in globulin; the cell count totaled 5 per cubic millimeter—all lymphocytes. A stained smear and later culture both proved to be negative. Another tap done five days later showed exactly the same changes.

Because of our failure to detect any evidences of infection, and because of the increased amount of globulin in the spinal fluid, lead poisoning was suspected. The mother was recalled the following morning for further questioning as to a possible source of the ingestion of lead. She stated that during the puerperium her nipples had cracked and on leaving the hospital she had been advised to use lead nipple shields. Her husband had obtained these after a prolonged search among at least a dozen drugstores. They were worn constantly between nurs-

Results of Analysis of Patient's Blood During Stay in Hospital

Dates	Red Blood Cells, Millions	Hemoglobin (Sahli) per Cent	Reticulo-cytes, per Cent	Stippled Cells, per Cent	White Blood Count	Differential Counts					Trans-fusion	Comment
						Poly-morpho-nuclears	Lym-phocytes	Monocytes	Eosino-phils	Baso-phils		
12/20/36	3.00	55	...	6.0	21,000	69	30	2	..	..	.....	Day after admission
12/21/36	4.0	...	....	..	..	..	..	..	.....	Convulsions stopped
12/22/36	55	7.6	8.0	....	..	..	..	..	..	.....	Diarrhea developed
12/23/36	11.0	8.6	....	..	..	..	..	..	.....	Diarrhea stopped
12/24/36	2.50	53	...	5.0	3,500	62	30	8	..	..	.....	Nasopharyngitis, convulsions recurred
12/25/36	54	...	...	....	..	..	..	..	..	.....
12/26/36	45	7.0	5.0	....	..	..	..	..	..	.....	Convulsions stopped
12/27/36	6.0	4.2	....	..	..	..	..	..	60 cc.	
12/28/36	62	5.0	3.1	....	..	..	..	..	..	90 cc.	
12/29/36	75	4.0	2.8	....	..	..	..	..	..	.....
12/30/36	70	2.4	3.1	....	..	..	..	..	..	.....
12/31/36	75	2.0	1.1	....	..	..	..	..	..	.....
1/ 1/37	4.4	72	...	...	18,400	42	58	..	..	..	.....	Bilateral otitis developed
1/ 5/37	85	1.4	0.3	....	..	..	..	..	..	.....
1/ 6/37	80	0.3	0.0	....	..	..	..	..	..	.....
1/ 7/37	0.3	0.0	....	..	..	..	..	..	.....
1/ 8/37	0.5	0.0	....	..	..	..	..	..	.....
1/ 9/37	0.7	0.0	....	..	..	..	..	..	.....
1/10/37	68	...	...	....	..	..	..	..	..	.....
1/11/37	0.6	0.0	....	..	..	..	..	..	.....
1/12/37	1.0	0.0	....	..	..	..	..	..	.....
1/13/37	2.4	0.8	....	..	..	..	..	..	.....	Direct van den Bergh test positive
1/14/37	1.5	0.3	....	..	..	..	..	..	.....
1/15/37	2.2	0.3	....	..	..	..	..	..	.....
1/16/37	0.6	0.0	....	..	..	..	..	..	.....
1/17/37	75	...	...	....	..	..	..	..	..	.....
1/18/37	2.2	0.4	....	..	..	..	..	..	.....
1/19/37	2.2	0.3	....	..	..	..	..	..	.....
1/24/37	68	...	...	....	..	..	..	..	..	.....
1/25/37	1.6	0.3	....	..	..	..	..	..	.....
1/26/37	2.8	0.4	....	..	..	..	..	..	.....
1/30/37	2.2	0.3	....	..	..	..	..	..	.....
1/31/37	62	...	...	....	..	..	..	..	..	.....
2/ 2/37	3.0	0.0	....	..	..	..	..	..	.....
2/ 3/37	4.2	70	3.2	0.0	13,700	31	60	2	4	3	.....	Platelets 370,000
2/ 5/37	3.0	0.0	....	..	..	..	..	..	.....
2/ 8/37	1.6	0.0	....	..	..	..	..	..	.....
2/10/37	4.4	0.0	....	..	..	..	..	..	.....	Icteric index 34; indirect van den Bergh test 2.1 units per liter
2/12/37	2.0	0.0	....	..	..	..	..	..	.....
2/28/37	4.3	70	...	0.0	10,950	37	60	3	..	..	.....

The pupils were equal in size and were dilated. They responded sluggishly to light. A rapid horizontal nystagmus was present, with the quick component to the left. Ophthalmoscopic examination revealed normal fundi.

The ears and ear drums were entirely normal. The nose was normal. The mouth was firmly closed and could be opened only with force. No teeth were present. The tongue, mucous membranes, tonsils and pharynx were entirely normal.

The chest was symmetrical and the heart and lungs were normal.

The abdomen was moderately distended; the liver edge was palpable 1.5 cm. below the right costal margin, and the spleen 2 cm. below the left costal margin. The kidneys were not palpable.

The arms were flexed and rigid; the hands were tightly clenched. The legs were extended and rigid. A right talipes equinus was present which had first been noted at birth.

The tendon reflexes (achilles, patellar, biceps and triceps) as well as the abdominal reflexes were hyperactive. A marked ankle clonus was elicited on the right. The Kernig sign was present in both lower extremities.

Immediately following examination a lumbar puncture was done. The pressure was found to read 18 mm. of mercury;

ings, the nipples being cleansed with boric acid solution before and after each feeding.

Routine examination showed an erythrocyte count of 3,000,000; the leukocyte count was 21,000 and the hemoglobin content 55 per cent (Sahli). Considerable coarse basophilic stippling of the red cells was found in the smear. X-ray examination showed wide dense zones of temporary calcification in all the long bones (fig. 2).

In view of the established source of the ingestion of lead, and the hematologic and radiologic changes, a definite diagnosis of lead encephalopathy was made.

Treatment and Progress.—The convulsions were controlled by the rectal administration of 2½ grains (0.16 Gm.) each of sodium bromide and chloral hydrate every six hours. In addition one-half grain (0.032 Gm.) doses of sodium phenobarbital were given-hypodermically twice a day. By the second hospital day the convulsions and vomiting had ceased entirely. However, the infant continued to be hypertonic and showed a generalized hyperreflexia. At this time diarrhea developed and he passed about four loose greenish stools daily. This was treated by dietary means, a dilute skim milk mixture being fed to which had been added 5 per cent rice flour. The diarrhea

subsided after three days. During the interval the administration of sedatives was continued.

At this time there was a recurrence of the convulsive seizures, and evidence of a nasopharyngitis was found. A second lumbar puncture was done, revealing a similar amount of globulin. It

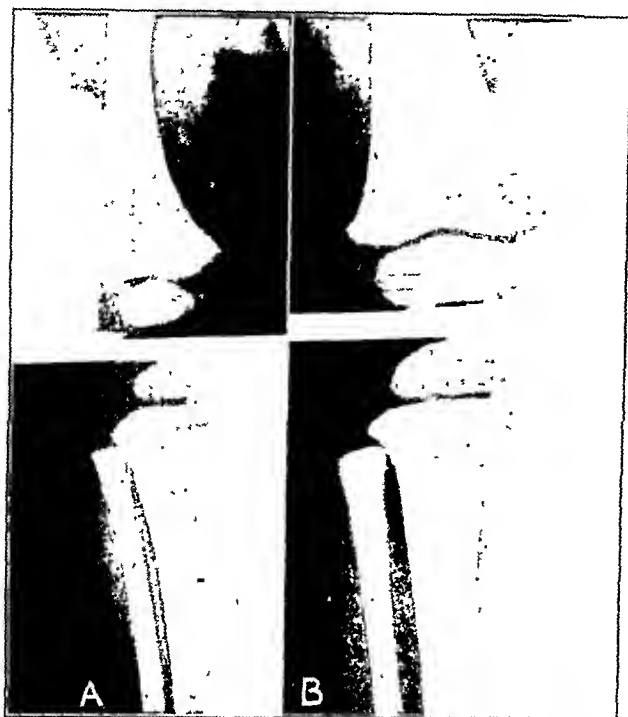


Fig. 2—Appearance of tibia: A, on admission of patient to hospital (at the age of 3½ months), showing line of increased density of end of bone. B, at 22 months of age, showing vestige of lead line about 2 cm. from the metaphysal end.

was assumed that the diarrhea and nasopharyngitis were responsible for the return of the encephalopathic symptoms, the acidosis so frequently encountered in diarrhea probably pro-

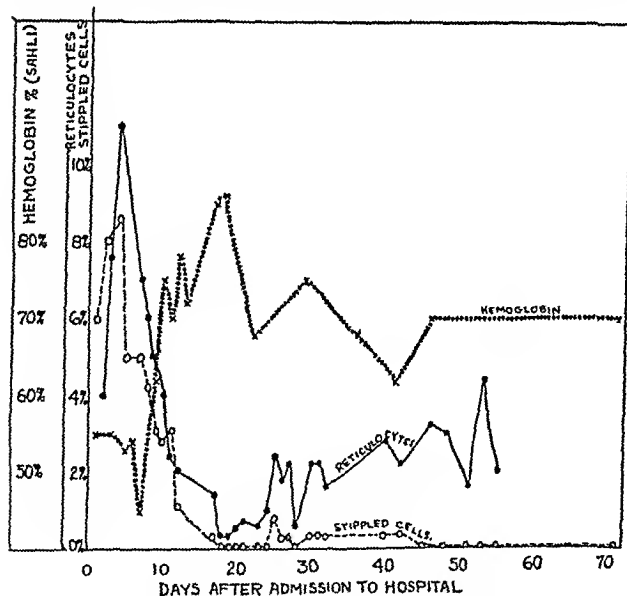


Fig. 3.—Fluctuations and relationships of hemoglobin, reticulocytes and stippled cells.

ducing a mobilization of lead from the bones and increasing the amount in the general circulation.

Measures were now employed in an attempt to deposit the circulating lead in the bones. To this end, 40 grains (2.6 Gm.) of disodium phosphate and 20 drops of viosterol were given daily in divided doses. In addition two blood transfusions of 60 and 90 cc. were given on successive days to correct the

anemia. Twenty-four hours after the institution of this therapy the convulsions had ceased and did not recur for the remainder of the infant's stay in the hospital. The disodium phosphate was discontinued after fifteen days. The viosterol was continued during the entire hospital stay. An acute suppurative bilateral otitis media, which developed on the twelfth day and which required a bilateral myringotomy, produced no exacerbation of his symptoms, the ears healing uneventfully after a period of three weeks.

In the accompanying table are summarized the results of examination of the infant's blood during his stay in the hospital. The numerous reticulocyte counts and counts of stippled cells were made to determine whether there was any relationship between the two (fig. 3). During the height of acute symptoms when the hemoglobin was low and there were fairly numerous reticulocytes, there were numerous cells showing basophilic stippling. When the hemoglobin had been raised to 86 per cent the number of reticulocytes declined and no stippled cells were seen. As the number of reticulocytes increased, presumably in response to a fall in hemoglobin, stippled cells were again seen. Even though the number of reticulocytes continued to be increased, the stippled cells disappeared from the blood. This last event was interpreted as an indication that lead had been driven from the blood stream and deposited in the bones, so that it could not produce basophilic stippling. This sequence of quantitative changes in reticulocytes, stippled cells and anemia is graphically shown in figure 3.

The inference that was drawn from these blood studies was that in the presence of lead circulating in the blood stream there was an apparent direct correlation between the number of reticulocytes and the number of stippled cells.

The infant remained in the hospital for a total period of eleven weeks and on discharge appeared to be in good condition. His weight at that time was 16 pounds 2 ounces (7,314 Gm.). He was active and happy, could sit with a little support and reacted normally to his environment. Both liver and spleen remained palpable to the same extent as on admission.

Following his discharge from the hospital, the infant continued to grow and develop in normal fashion. On reexamination at 11 months of age the infant was very well nourished and well developed, weighing 22¾ pounds (10.3 Kg.). He was 29 inches (73.7 cm.) tall, had four teeth and was able to walk by himself. He had mumps at 8 months, measles at 10 months and whooping cough at 14 months, from all of which he recovered uneventfully.

In June 1938 at 22 months of age he was entirely normal physically and mentally (figure 4). Roentgenograms taken at this time showed that the vestiges of old lead lines were still visible (figure 5). At no time following his discharge from the hospital did he manifest any symptoms or stigmas which could be attributed to his lead poisoning.

SUMMARY

1. A case of lead encephalopathy in a 3½ months old breast-fed infant in which there was complete recovery, was caused by the use of lead nipple shields by the mother.

2. There is an apparent correlation between the number of reticulocytes and the number of cells showing basophilic stippling.

Bainbridge, Eighteenth and Fitzwater streets.



Fig. 4.—Patient at 22 months of age, June 1938.

Special Article

DIPHTHERIA MORTALITY IN LARGE CITIES OF THE UNITED STATES IN 1938

SIXTEENTH ANNUAL REPORT

The means employed for obtaining the data for this review have been outlined in the report on typhoid deaths.¹ As has been the practice in all previous annual reviews of diphtheria and typhoid, statistics have been obtained from local health officers. As the time of the 1940 census approaches, local estimates of population become less trustworthy. They provide, however, the best available data. The rates must be readjusted in light of the facts obtained at the time of the next federal census.

As has been the case in previous articles, the local health departments report not only the total number of diphtheria deaths that actually occur in the community but also the number of such deaths occurring among nonresidents.

The fourteen New England cities (table 1) report a continued downward trend in the death rate for the

TABLE 1.—Death Rates of Fourteen Cities in New England States from Diphtheria (Including Croup) per Hundred Thousand of Population

	1938		1937		1936		1935		1934		1933		1932		1931		1930		1929		1928		1927		1926		1925		1924		1923		1922		1921		1920		1919		1918		1917		1916		1915		1914		1913		1912		1911		1910		1909		1908		1907		1906		1905		1904		1903		1902		1901		1900		1899		1898		1897		1896		1895		1894		1893		1892		1891		1890																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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nonresidents. These deaths occurred in Pittsburgh hospitals among sporadic cases from western Pennsylvania. In Reading there were five deaths among residents and the state health department has charged one nonresident back against this city. Of the five

TABLE 4.—*Death Rates of Eighteen Cities in East North Central States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	1905	1904	1899	1894
Grand Rapids	0.0	0.6	0.0	0.3	2.0	1.9	6.9	73.5	20.0	26.6	17.2	32.4	99.2																								
Fort Wayne...	0.0	0.8	2.4	3.3	5.1	13.1	6.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
South Bend...	0.0	0.2	0.9	1.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Youngstown...	0.0	1.7	1.1	3.3	10.5	18.5	11.9	40.5	33.5	28.0	17.6	28.4	76.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peoria.....	0.0	1.7	2.6	5.3	4.9	7.4	10.8	10.6	10.9	14.0	14.6	68.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Akron.....	0.0	2.8	1.6	2.7	4.9	10.4	18.9	37.8	21.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Milwaukee...	0.3	0.6	0.3	2.0	8.5	11.4	19.8	27.8	26.4	22.7	61.7	116.2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cleveland...	0.5	0.6	1.1	2.5	15.3	14.7	20.0	24.6	20.8	42.6	45.3	95.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Toledo.....	0.6	2.5	1.0	2.8	7.2	22.4	14.1	25.4	20.4	56.8	34.6	89.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Canton.....	0.9	0.0	1.0	1.7	2.9	17.5	15.1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Evansville...	0.9	6.3	2.8	3.2	3.7	13.9	14.9	16.1	21.2	13.8	18.1	69.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Detroit.....	1.0	2.0	1.1	4.8	19.7	34.3	33.2	38.3	22.8	38.5	62.9	132.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Columbus....	1.8	1.9	1.2	3.2	4.6	8.5	7.6	12.1	10.5	11.6	28.5	56.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ft.	1.9	1.8	1.2	2.7	4.5	20.9	25.5	32.7	11.0	16.8	6.9	69.2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chicago.....	1.9	2.3	2.5	4.3	11.7	17.5	31.2	37.9	27.0	33.9	69.7	117.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cincinnati...	3.2	1.1	1.7	3.2	5.2	10.6	13.2	18.0	17.0	17.3	37.7	103.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Indianapolis...	4.8	2.7	3.0	3.1	6.6	11.7	21.4	22.5	33.3	15.9	36.4	97.3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dayton.....	5.7	1.4	2.7	3.5	4.6	9.4	9.3	22.1	13.3	17.2	27.4	82.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

2.96 in 1936 (forty-four deaths in 1938, forty-two deaths in 1937, thirty-eight in 1936). The rate in these cities is the highest for all groups. There is no city with a rate below 1.0, and Knoxville has the highest of all rates for 1938. This is due to the fact that eight deaths among nonresidents are charged to a total of eleven. The hospital facilities in the city draw a large number of nonresidents from the surrounding area. Most of the deaths occurred among residents of Knox County, in which Knoxville is situated. Four cities in this group of six report one third or more of diphtheria deaths to be in nonresidents. Of five deaths in Memphis, two were of residents. Five of the eight

TABLE 8.—*Death Rates of Eleven Cities in Mountain and Pacific States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1938	1937	1936	1934	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894
Long Beach.....	0.0	0.0	1.3	0.8	2.6	10.4	.....	.....	.....	.....	.....	.....	.....
Tacoma.....	0.0	0.0*	0.0	3.9	9.3	12.4	7.7	.....	.....	.....	.....	.....	.....
Seattle.....	0.3	0.8	0.8	0.4	1.4	6.6	5.5	5.2	12.5	13.4	27.2	.....	.....
Salt Lake City.....	0.7*	2.0*	0.0	0.3	10.1	12.5	14.5	7.1	34.2	46.0	14.8	56.7	.....
Spokane.....	0.8	0.0	0.0	0.7	7.5	11.3	4.2	1.6	25.8	.....	50.5	18.1	.....
Portland.....	0.9	0.6	0.3	1.3	6.4	11.3	6.0	12.3	12.3	20.2	.....	.....	.....
San Francisco.....	1.3	1.2	0.6	1.2	4.6	23.0	17.0	0.2	14.4	44.2	21.6	54.8	.....
Oakland.....	1.9	2.6	1.0	2.0	7.4	18.8	8.1	10.3	16.1	29.1	.....	.....	.....
Los Angeles.....	2.2	2.9	3.5	4.5	7.0	14.4	7.1	7.5	15.3	25.4	35.3	46.0	.....
San Diego.....	3.7	3.2	2.3	2.9	6.6	12.2	10.5	8.0	5.8	2.4	.....	.....	.....
Denver.....	4.5	2.0	2.7	3.0	8.0	23.2	6.7	10.2	20.8	29.6	27.3	150.2	.....

* All diphtheria deaths were stated to be in nonresidents.
† One third or more of the reported diphtheria deaths were stated to be in nonresidents.
‡ Diphtheria deaths from Chapin's Municipal Sanitation.
Incomplete data.

TABLE 9.—Eight Cities with Highest Diphtheria Rate for 1938

Atlanta.....	4.0†	El Paso.....	4.9
Nashville.....	4.3†	Reading.....	5.3
Denver.....	4.5	Dayton.....	5.7
Indianapolis.....	4.8†	Knoxville.....	8.6†

† One third or more of the reported diphtheria deaths were stated to be in nonresidents.

TABLE 10.—Ten Cities with No Diphtheria Deaths in 1937 and 1938

Des Moines	Long Beach	Rochester
Duluth	Lowell	Springfield
Elizabeth	Lynn	Utica*
Ellet		

* No diphtheria deaths in five years.
† No diphtheria deaths in four years.
‡ No diphtheria deaths in three years.

deaths in Birmingham were among nonresidents. Nashville reports three among residents in a total of seven. After passing through 1937 with no resident death, Louisville records nine deaths in 1938, seven of residents.

The nine cities in the West North Central states (table 6) report a continued decrease in rate (1.37 in 1936, 1.26 in 1937, 1.11 in 1938). The diphtheria deaths decreased from thirty-five in 1937 to thirty-one in 1938. Although there were four cities on the honor roll in 1937, only two (Duluth, Des Moines) remain on this list in 1938. Duluth reports no diphtheria death in three years, Des Moines none in two years. Allocations have not, however, been completed by the Iowa state health department. There is but one city in the group with a death rate in excess of 2.0. Of sixteen deaths reported in St. Louis, twelve occurred among nonresidents. In 1937 there were eleven among nonresidents in a total of twenty-seven. In 1938 three

fourths of the deaths in St. Louis were in nonresidents. The influence of hospitalization policies is very evident. After two years with no death among residents, Kansas City, Mo., reports five such deaths in 1938 in addition to one death among nonresidents.

TABLE 11.—*Twenty-Four Cities with No Diphtheria Deaths in 1938*

Akron	Long Beach	Rochester
Albany	Lovell	South Bend
Des Moines	Lynn	Springfield
Duluth	New Bedford	Syracuse
Elizabeth	New Haven	Tacoma
Erie	Paterson	Utica
Fort Wayne	Peoria	Yonkers
Grand Rapids	Providence	Youngstown

TABLE 12.—Thirteen Cities with No Diphtheria and Typhoid Deaths in 1938

Elizabeth	Lynn*	South Bend
Erle	New Bedford	Tacoma
Fort Wayne	Peoria	Utica**
Grand Rapids	Providence	Youngstown
Lowell		

* No diphtheria or typhoid deaths in two years.
 ** No diphtheria or typhoid deaths in three years.

The eight cities in the West South Central group (table 7) have relinquished their unenviable position of having the highest group rate. The East South Central cities have succeeded to this position. The Southwestern cities have a rate of 2.69 for 1938, which compares favorably with the highest quinquennial average for 1930-1934 (6.55). The diphtheria deaths decreased from sixty-seven in 1937 to fifty-seven in 1938. There is no city without a death and but one city with a rate in excess of 4.0. El Paso recorded the highest rate for all cities in all groups in 1937. In

TABLE 13.—Five Cities in Which All Diphtheria Deaths in 1938 Were Stated to Be in Nonresidents

Boston
Hartford*
Richmond

* All typhoid deaths in 1938 were stated to be in nonresidents.
** No typhoid deaths in 1938.

TABLE 14.—Number of Cities with Various Diphtheria Death Rates

	No. of Cities	40 and Over	20 and Over	10 and Over	5 and Over	Under 5	0.0
1890-1894.....	61	52	60	61	62	2	0
1895-1899.....	66	34	53	63	65	1	0
1900-1904.....	68	22	46	64	66	2	0
1905-1909.....	72	3	43	66	71	1	0
1910-1914.....	79	1	36	63	78	1	0
1915-1919.....	84	0	25	62	81	3	0
1920-1924.....	88	0	14	65	86	2	0
1925-1929.....	92	0	1	22	67	25	0
1930-1934.....	93	0	0	0	24	66	0
1935.....	93	0	0	2	17	76	19
1936.....	93	0	0	0	5	69	19
1937.....	93	0	0	0	3	70	20
1938.....	93	0	0	0	3	66	24

1938 there are three cities with higher rates. With six deaths in Dallas, two were among nonresidents. Of nineteen deaths in New Orleans, eleven were among residents.

The Mountain and Pacific states (table 8) report seventy-four deaths in 1938, an increase over the fifty-nine deaths recorded in 1937. The rate has increased from 1.43 to 1.75, approximately the same as for 1936 (1.78). There are two cities with no death in 1938

(Long Beach, Tacoma). There has occurred no diphtheria death among residents of Tacoma in four years; none in Salt Lake City in three years. Spokane, after remaining on the honor list for two consecutive years, reports one death among residents in 1938. The nine recorded deaths in San Francisco are among residents. It is reported that, in Los Angeles, thirteen of the thirty-two deaths occurred among nonresidents. The figures are identical with those for the preceding year. Denver reports fourteen deaths among residents, no record being kept for nonresidents.

Of the entire ninety-three cities there remain three with a rate of 5.0 and over (table 14). The number

TABLE 15.—Total Diphtheria Death Rates for Eighty-Eight Cities, 1923-1938*

	Population	Diphtheria Deaths	Diphtheria Death Rate per 100,000 of Population
1923	31,060,848	4,076†	13.13
1924	31,722,841	3,479	10.84
1925	32,384,834	3,133	9.67
1926	33,046,827	3,106	9.40
1927	33,708,820	3,493	10.36
1928	34,370,813	3,176	9.24
1929	35,032,806	2,738	7.82
1930	35,694,802	1,827	5.12
1931	36,356,812	1,366	3.74
1932	37,018,812	1,191	3.21
1933	37,680,812	861	2.28
1934	38,342,812	822	2.14
1935	39,004,812	764	1.96
1936	39,666,812	561	1.40
1937	40,328,812	556	1.38
1938	40,990,812	473	1.15

* The five following cities are omitted from this summary because data for the full period are not available: Jacksonville, Miami, Oklahoma City, South Bend and Utica.

† Data from Fort Worth lacking

‡ The rate for the ninety-three cities in 1931 is 2.09 (population 37,437,812, diphtheria deaths 782). The corresponding rate for 1934 was 2.26 and the average for 1920-1934 was 3.14. The rate for ninety-three cities in 1936 is 1.51, population 39,666,812, diphtheria deaths 577.

Rate for ninety-three cities in 1937 was 1.46 (total population 40,328,812, diphtheria deaths 588).

Rate for ninety-three cities in 1938 was 1.23 (total population 40,990,812, diphtheria deaths 483).

Special Note—Deaths for 1938 have been corrected, as Yonkers originally reported eight deaths and later corrected report to one death.

of cities with no deaths from diphtheria has increased by four; that is, from twenty to twenty-four. A most significant gain has been made by the cities in the East North Central states (table 4).

TABLE 16.—Total Diphtheria Death Rates per Hundred Thousand of Population for Ninety-Three Cities According to Geographic Dimensions

	Population	Diphtheria Deaths		Diphtheria Death Rates			
		1928	1937	1928	1937	1930	1925-1929
New England	2,645,438	17	21	0.64	0.79	3.38	8.34
Middle Atlantic	13,469,796	64	95	0.48	0.71	2.50	9.97
South Atlantic	2,638,626	4	53	1.53	2.04	3.54	7.37*
East North Central	9,907,440	153	186	1.54	1.85	3.66	11.21†
East South Central	3,355,080	44	42	3.25	3.16	6.26	6.34
West North Central	1,385,688	31	35	1.11	1.26	3.22	7.82
West South Central	2,120,573	57	67	2.69	3.21	6.55	9.24†
Mountain and Pacific	4,220,735	74	39	1.71	1.43	2.69	6.28

* Lacks data for 1921 for Jacksonville and Miami

† Lacks data for South Bend

‡ Lacks data for Oklahoma City for 1925 and 1926.

For the entire group of ninety-three cities the diphtheria death rate in 1938 was 1.23, compared with a rate of 1.46 for 1937 and 1.51 for 1936. The actual number of diphtheria deaths has decreased by eighty-five (from 568 to 483).

The remarks from the various public health administrators indicate that intensive programs are being carried on in many parts of the country. The family physician is teaming up more frequently with the health department and medical society and dispensing more

preventive services in his own office. The evidence at hand indicates that the protection programs so extensively maintained throughout the country are resulting in a lower death rate from diphtheria.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE AND REPORTS

HOWARD A. CARTER, Secretary

MEDICAL DIATHERMY

Medical diathermy is the therapeutic use of heat generated in the body tissues by a high frequency current which has insufficient local intensity to produce temperatures high enough to destroy the tissues or impair their vitality. Such currents are applied locally by three methods: (1) conventional long wave diathermy, contact metal electrodes being used, (2) short wave diathermy with an electric field, air-spaced or insulated electrodes being used, and (3) short wave diathermy with an electromagnetic field method, a cable being used.

In conventional or long wave diathermy the frequency of oscillation is usually from one-half million to three million cycles a second. In short wave diathermy the frequency of oscillations may be from ten million to 100 million cycles a second.

PHYSIOLOGIC EFFECTS OF LOCAL MEDICAL DIATHERMY

The effects of electric current when applied to body tissues may be thermal, chemical or mechanical, depending on the physical characteristics of the current. The fundamental reason for using high frequency currents for heating is that the body heat may be raised without injury or electrical stimulation.

With regard to short wave diathermy, there has arisen considerable controversy as to whether it produces specific effects other than that of heat. In the light of present observations, the consensus seems to be that no definite physiologic effects other than those attributable to heat have been substantiated. The physiologic effects of heat have been considered by Pemberton¹ and by Gill² and will not be discussed here.

SHORT WAVE DIATHERMY VS. CONVENTIONAL DIATHERMY

The consensus seems to be that there is no great difference in the effects produced by short wave diathermy and conventional diathermy except that the former apparently produces deeper, more uniform heating and is more readily applied.

DOSAGE

The regulation of doses in medical diathermy is empirical. In short wave diathermy the only recognized method of measuring doses is the comfortable heat sensation of the patient's skin. The milliammeter on the high frequency apparatus does not measure the electrical energy passing through the patient. In high frequency apparatus the milliammeter indicates the amount of current passing through it but does not measure the electrical energy passing through the patient. The patient's tolerance is the most important guide for the final dose to be used. If it is suspected that the sensibility to heat may be deficient in the skin over which the electrodes are placed, it is advisable to

1. Pemberton, Ralph: Physiologic Effects of Heat, Handbook of Physical Therapy, 1939.
2. Gill, A. Bruce: Heat in Surgical and Orthopedic Conditions, Handbook of Physical Therapy, 1939.

test the skin with hot water in a test tube, using the operator's skin sensation as a control.

It is to be emphasized that in short wave diathermy there should be no clothing between the electrode and the skin. A burn received from a treatment by short wave diathermy when the clothes have not been removed might readily provoke a medicolegal situation. After the treatment it is important to inspect the skin of the part treated.

The regulation of dosage with short wave diathermy is an even more empirical procedure than with conventional diathermy. The milliammeter is connected to the oscillatory circuit of the apparatus and serves chiefly as an indicator that electrical energy is passing. It will also indicate that in a certain position of the controls, when the patient's circuit is tuned to the oscillator circuit, there is a maximum flow of energy in the treatment field.

CONTRAINDICATIONS

It is important to keep the contraindications for diathermy in mind. The local application of high frequency currents is contraindicated in the case of certain acute inflammatory processes, such as acute non-draining cellulitis and acute infectious arthritis, or any condition in which there is a tendency to hemorrhage, such as a gastric ulcer; over areas in which the appreciation of heat has been impaired or lost, as in the case of certain peripheral nerve injuries; through the abdomen, pelvis or lower part of the back during pregnancy; during menstruation or thirty-six hours before or after menstruation, and over areas where a malignant growth is suspected.

INDICATIONS

Contusions.—The early application of cold by compresses or ice bag will reduce ecchymosis, swelling, pain, tenderness and limitation of motion. After the first twenty-four hours, infra-red radiation and medical diathermy may be applied to increase activity of the circulation.

Muscle Strains.—These are treated like contusions with regard to the application of cold and heat. For muscle strains, diathermy must be applied for only a short time and at a low intensity for the first treatment, as it may cause an increase in the swelling.

Myositis Ossificans.—With muscle injuries there is always the possibility of the development of myositis ossificans, which tends to progress unless the affected area is properly treated. The treatment consists primarily in rest and increase of local circulation by various means, especially diathermy.

Sprains and Dislocations.—There are various degrees of sprains, and treatment varies in direct proportion to the damage done to the soft tissues. Immediate walking may be advised in cases of slight sprain of the ankle, while rest in bed may be indicated in cases of severe sprain.

A mild sprain of the ankle can be satisfactorily treated by strapping to prevent lateral motion but not plantar and dorsal flexion. The efficacy of this method depends on the efficiency of the strapping. It is thought that plantar and dorsal flexion have a direct effect in promoting return of circulation and prevention of adhesions.

In the treatment of some sprains and dislocations, fixation by a removable plaster splint and the daily application of heat and massage may be preferred. In sprains or dislocations, ligaments are torn and muscles, blood vessels, nerves, tendons and the synovial membranes of the joint are injured; there are hemorrhage from the torn vessels, swelling and muscle spasm.

Inflammatory action is noted with heightened local metabolism and elevation of temperature. For immediate treatment, therefore, local applications of cold with rest, proper compression, bandaging and elevation are indicated. After the first twenty-four to forty-eight hours, there are local edema and decreased local metabolism. Then the treatment should consist in removal of the splint and bandage followed by the application of external heat or diathermy, and this is usually succeeded by massage and exercise to produce a free flow of blood through the part. One must not forget, however, that other methods of applying external heat are available, such as those described in other chapters of the Handbook of Physical Therapy concerning heat. Among other important measures following the heating of these parts is the stimulation of circulation by massage and exercise.

Bursitis.—The first attack of bursitis can usually be relieved by physical therapy in about two weeks. The part should be placed at rest. For acute bursitis, infra-red radiation from a luminous source is given for thirty minutes at least twice daily and short wave diathermy is applied for twenty minutes once daily. As the pain diminishes, careful massage and relaxed motion should be employed; later, active exercise is started. Acute subacromial, radiohumeral, olecranon and prepatellar bursitis are treated in this manner. In a few cases, diathermy may aggravate the pain. In these cases it may be necessary to put the patient to bed and apply continuous moist heat.

For chronic subacromial bursitis, conservative measures, such as rest, infra-red irradiation, short wave diathermy, massage and exercise should be tried before operation is considered. In some cases of chronic involvement with severe pain the shoulder should be immobilized in an airplane splint. In this form of bursitis, calcified deposits may form without any apparent cause, are often fragmented and may disappear spontaneously. It is believed that diathermy may aid in the absorption of such deposits. When conservative measures fail, operative removal of the bursa and its calcified deposit is advised.

Tenosynovitis.—Traumatic tenosynovitis most commonly affects the tendons of the wrist, the achilles tendon and the long head of the biceps. The treatment is to immobilize the joints whose motion causes pain in the tendons. The splint is removed and short wave diathermy is applied for twenty minutes once daily, followed by radiant heat once or twice daily for twenty minute periods. It may be advisable to use motion in a whirlpool bath to prevent adhesions.

Rheumatic, gouty and gonorrheal tenosynovitis are treated in the same manner as the traumatic form. Pyogenic tenosynovitis is a surgical problem and diathermy is not used in its treatment.

Chronic Arthritis.—This is not a disease of certain joints but rather a systemic illness, in which there may be disturbances of the circulation, general metabolism, gastrointestinal tract and nervous system. The syndrome of chronic arthritis includes the nerve, muscle and joint diseases called neuritis, myositis, fascitis and arthritis, according to the part affected. Local and general applications of heat have perhaps their most extensive varied usage in the treatment of chronic arthritis. In chronic arthritis the circulation in the more narrow vessels, especially at the periphery, is usually diminished. The involved areas may be cold and clammy, but they may also present rubor, dolor and color. In any event, local heat may prove of great value, as may systemic applications, because of the

alteration and improvement in the circulation brought about. Great care should be exercised in the application of heat in cases of hypertrophic arthritis, since heat may constitute a form of trauma which aggravates the conditions already present. When indicated, however, local application of heat should be made from two to four times a day in the patient's room to produce an adequate increase in circulation, and, if medical diathermy is used, it may be supplemented with the former treatment. When medical diathermy is used for chronic arthritis it should be used for a short period with low intensity for the first few doses, because sometimes it causes an aggravation of the local symptoms. Clinical benefit, however, has been observed so often from diathermy that one should always give it a trial.

Myositis and Myofasciitis.—These conditions are inflammations of the muscles characterized by pain on motion, spasm and tenderness on pressure. When the inflammation involves the lumbar muscles, it is known as lumbago; the intercostal spaces, pleurodynia, and the neck muscles, torticollis. In the local treatment of acute forms, rest and the application of heat are recommended. This heat may be applied by hot compresses, continuous moist heat, infra-red radiation from a luminous source or medical diathermy.

Fibrositis.—This has been defined as a swelling and proliferation of the white fibrous tissue anywhere in the body in response to injury or very toxic infection, with a secondary effect of pressure on arterioles and nerve filaments. Many American clinicians have been loath to recognize fibrositis because its morphologic lesions are ill defined and its symptoms subjective. Those who do recognize it by its nodules in the muscles classify most forms of muscular rheumatism as fibrositis and treat the condition with deep massage. Heat, massage and exercise are used as adjuncts in the treatment, and diathermy may be used as one of the methods of giving heat.

Fractures.—The principles of fracture treatment are restoration of anatomic form, maintenance of alignment and fixation of the fracture during the period of union, and maintenance and development of function. (For a more complete discussion, see "Physical Therapy in the Treatment of Fractures," by Dr. Frank D. Dickson, included in the Handbook of Physical Therapy.) Heat, massage and mobilization are important physical therapy measures, the object of which is to increase the activity of the circulation, to prevent adhesions in muscles and joints, to prevent muscular atrophy and later to increase muscle strength. The heat, of which one method of production is medical diathermy, is used mainly as an adjunct to massage and exercise.

Genito-Urinary Conditions.—Medical diathermy is used by a few clinicians as one of the methods of applying heat for the treatment of epididymitis and prostatitis.

Pelvic Infections.—Some gynecologists use medical diathermy as one of the methods of applying heat in cases of pelvic infection, although most gynecologists believe that a low degree of heat usually suffices.

Respiratory Diseases.—The chest compress is used by some clinicians to apply heat in the treatment of bronchitis. If the patient is in the hospital, it is believed that medical diathermy is more effective and easier to apply. With bronchitis, this method relieves the pain and soreness in the chest, reduces the viscosity of the secretions and thus makes expectoration easier; it also relieves the coughing.

It has been observed that, in the management of pneumonia, medical diathermy does seem to be of

definite benefit in reducing the severity of thoracic pain. This symptomatic relief is important. The main factors concerned in the production of anoxemia are the passage of blood through the unaerated portion of the lung and shallow breathing. The shallow breathing may be due to pleuritic pain restricting the respiratory excursions. The relief of this pain by diathermy increases the respiratory excursions and this may be the explanation for the decrease in cyanosis that is usually noticed. There is no evidence that medical diathermy has a specific action on the pneumonic process.

Gastrointestinal Diseases.—For such conditions as acute enteritis, spastic colitis and simple catarrhal jaundice, abdominal warmth is suggested as an aid in treatment. An electric heating pad or a hot water bag kept on the abdomen for hours at a time is useful therapeutically. Infra-red irradiation is a convenient way of applying heat; diathermy, if mild and properly applied, is also of benefit.

Inflammation of the Peripheral Nerves.—With the various forms of neuritis, radiculitis and neuralgia, applications of heat may allay the inflammation and the pain. For deep penetration of heat into the tissues, medical diathermy may be used as a method of applying heat as an adjunct in general treatment. In the case of acute neuritis or acute radiculitis, it is believed that the first two treatments should be given at half the patient's tolerance for about ten minutes to see whether there is any aggravation of the symptoms.

Acute and Chronic Sinusitis.—Infra-red irradiation and medical diathermy are useful adjuncts to other treatment after adequate drainage has been established. Medical diathermy is of value as an aid in the relief of pain; the frontal and maxillary sinuses are the ones most suitable for treatment.

Eye Diseases.—The indications for medical diathermy are by no means well established. It is believed that this treatment may be used to relieve pain from chronic keratitis, neuralgia, herpes zoster and iritis.

Suppurative Processes.—Short wave diathermy has been advocated in the treatment of suppurative lesions with external drainage and doubtless will be of aid in this treatment. However, sufficient comparative study is not available to determine whether short wave diathermy is more effective than the simpler forms of heating.

SUMMARY AND CONCLUSIONS

While there appears to be no great difference between the effects produced by conventional and short wave diathermy, short wave diathermy seems to produce deeper, more uniform heating and is more readily applied, although the control of dosage is more difficult than with conventional diathermy. Nevertheless, burns are less likely to be produced in short wave diathermy.

So far as competent investigators have been able to determine, there is no demonstrable selective thermal action in the living body. The Council has accepted certain short wave apparatus, which are listed in a booklet "Apparatus Accepted by the Council on Physical Therapy of the American Medical Association." Physicians are urged to read this booklet before purchasing an apparatus. The Council requires certain definite tests for deep heating before accepting an apparatus, and its survey of the machine gives the results of these tests as well as the efficiency and accepted technics for use of the machine.

Clinical observations, however, have not indicated that the penetration of heat induced by short wave diathermy presents advantages not obtained by con-

ventional diathermy. In the light of present observations, no specific physiologic effects other than those attributable to heating have been substantiated.

The consensus (particularly of those who have performed careful experiments) would seem to be that the effect of various wavelengths between 3 and 30 meters is approximately the same. There are apparently no specific bactericidal effects other than those attributable to heat, either in vitro or in vivo. There is no reason to believe that treatments of five minutes or less have any marked action other than a psychic one.

The chief advantages of short wave diathermy over conventional long wave diathermy are its ease of application and the lessened danger of burns.

LUXOR PROFESSIONAL MODEL ALPINE LAMP ACCEPTABLE

Manufacturer: Hanovia Chemical and Manufacturing Company, Chestnut Street and N. J. R. R. Avenue, Newark, N. J.

The Luxor Professional Model Alpine Lamp contains a high pressure, low voltage quartz mercury arc burner and is designed for therapeutic use in hospitals or offices. It is available for operation on alternating current (Model S) and direct current (Model E). The burner is placed inside a processed aluminum reflector so designed as to keep the hood temperature cool. Hinged doors on the hood intercept light and control, within limits, the size of the area irradiated. By rotating the hood, the angle of projection of light may be altered. A steel tape measure is attached to the side of the hood to measure distance from burner to patient.

The hood is mounted on a four-pod base resting on four rubber-tired ball-bearing casters and is adjustable within limits of 53 inches and 68 inches from the floor. When fully telescoped, the overall height of the lamp is 57 inches. The shipping weight of the entire unit is approximately 130 pounds. It is finished in ivory-colored enamel.



Luxor Professional Model Alpine Lamp.

Burners for both alternating and direct current are similar to an extent. Each comprises a transparent fused quartz tubular vessel provided with metal lead-ins for the electric current which are sealed vacuum tight directly to the quartz. The alternating current burner has solid, self-heating electrodes. The burner for the direct current has a mercury pool cathode and a solid incandescent anode. In both models the radiant energy is generated by means of an electric discharge through mercury vapor. The spectrum of radiant energy is that of mercury vapor and the spectral energy distribution of both lamps is that of the high pressure mercury arc in quartz. The load wattage for Model S (alternating current) is 450, for Model E (direct current) is 310. Electric current is supplied to the burner in Model S from a transformer through a reactor; in Model E through a rheostat.

The intensity of the ultraviolet radiant energy at 30 inches from the burner for wavelength 3,130 angstroms and shorter is 1,200 microwatts per square centimeter. This energy will produce a first degree erythema (mild reddening) on the average person after an exposure of one minute. The alternating and direct current lamps are equal in intensity and erythema production.

Reports from clinics indicate that intensities lower than those produced by this lamp are effective in the protection and cure of rickets and infantile tetany in children.

The unit was tried out in a clinic acceptable to the Council and reported to give satisfactory clinical service. The minimal erythema time at 30 inches was three quarters of a minute. The burner lighted instantaneously and the warm-up period was short as compared to older types of ultraviolet units.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Luxor Professional Model Alpine Lamp for inclusion in its list of accepted devices.

HIGH TENSION SHORT WAVE APPARATUS, MODEL RF-1, ACCEPTABLE

Manufacturer: High Tension Electric Corporation, 118 West Twenty-Second Street, New York.

The High Tension Model RF-1 Short Wave Apparatus is recommended for medical and surgical diathermy. It is a portable model, equipped with pad and cuff electrodes and electro-surgical accessories. The unit proper is 19 inches long by 12 1/4 inches high by 11 1/2 inches deep. The total weight of the unit and subcabinet is 92 1/2 pounds and the weight of the unit alone, without subcabinet, is 41 1/2 pounds.

Two self-rectifying tubes are utilized in a push-pull oscillator circuit of modified design. The wavelength is between 15 and 15.6 meters. The patient's circuit is inductively coupled to the oscillating circuit. Current to the patient is regulated through a tuning condenser.

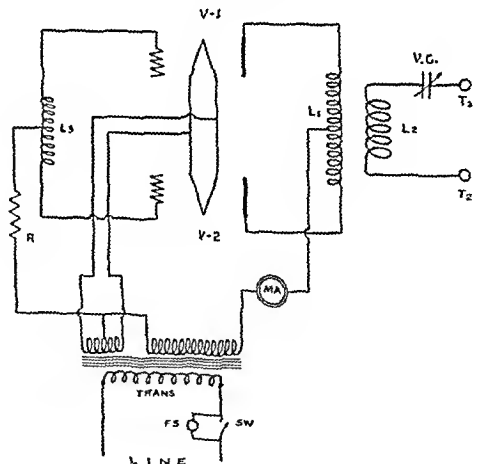
The maximum power required to operate the RF-1 Model is approximately 750 watts. The output power is about 275 watts as determined by the lamp load method.

The final transformer temperature of the unit after operation at full load for two hours was 71 C. The final temperature at the top of the cabinet over the transformer was 57.5 C. The final temperature at the bottom of the cabinet was 49 C. These temperatures are within the limits of safety.

Evidence was submitted by the firm to substantiate tissue heating claims made for the Model RF-1 Short Wave Diathermy Apparatus as applied to the living human thigh. Three male subjects were used in these tests. Temperatures before and after the twenty minute applications were taken by means of a hypodermic thermocouple calibrated against a thermometer standardized by the National Bureau of Standards. The skin surface temperatures and the muscle temperatures were observed. The electrodes were 21 1/2 inches long and 2 1/4 inches wide. The average distance from center to center of the cuffs was 8.6 inches.



High Tension Short Wave Apparatus, Model RF-1.



Schematic diagram.

The cuffs were operated from the skin by means of felt pads and towels to 1 1/4 inches. The average thigh circumference was 18.7 inches. The average room temperature was 70 F. and the humidity was 51 per cent.

Averages of Six Observations, Cuff Technic

Deep Muscle		Rectal	
Initial	Final	Initial	Final
97.8	106.1	99.1	99.3

Using the cuff technic only, the Council on Physical Therapy voted to include the High Tension Short Wave Apparatus, Model RF-1, in its list of accepted devices.

THE CASE OF BRINKLEY VS. FISHBEIN

PROCEEDINGS OF A LIBEL SUIT BASED ON AN ARTICLE PUBLISHED IN *HYGEIA*

(Continued from page 1968)

TESTIMONY OF DR. MORRIS FISHBEIN

Dr. Morris Fishbein stated his qualifications as a physician and as a writer. He then described the work of the American Medical Association, including the work of the various councils, bureaus and departments. He then described fully *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* and its distribution; next, how a physician becomes a member of the American Medical Association, and the nature of membership; then the foundation of *Hygeia*, its purposes, circulation, income and loss.

The evidence then proceeded:

Q.—Doctor, referring to the article upon which this suit is based, you were the author of that article, weren't you? A.—Yes, sir.

Q.—Will you tell us from what source or sources you procured the information and material for that information? A.—Most of the material was secured from the files of the American Medical Association, which are maintained constantly, which I have described, by the Bureau of Investigation; the Bureau of Investigation, which was established in 1905, maintains permanent files containing the records of all persons, devices, drugs and similar promotions which come under its attention. Most of the material regarding the plaintiff was on file in the records of the Bureau of Investigation; there were also on file in that record the complete reports having to do with the work of the plaintiff issued by him from time to time at his various addresses; there were also on file the records of various hearings that had been held in various states relative to revocation of license.

Mr. Morris Jr.—We object to the witness's statement of these various matters as his conclusion and opinion of what they might be.

THE COURT:—Isn't it the rule of evidence that if the party writing the article honestly believes it to be so, why, it may be tendered to mitigate damages?

Mr. Morris Jr.—But he can't tell what is in some instrument or letter that he doesn't produce.

THE COURT:—I shouldn't think so, not as proof of the truth of those facts, but he can testify as to the sources from which he got the information he put in the article.

Mr. Morris Jr.—He can't tell what he got, and he has now been stating that, and we move to exclude it. We agree with the Court that he is entitled to state where he got it from, but not the contents of the written matter.

THE COURT:—I didn't understand that he had stated the contents; he said he got it from certain records of hearings where the matter was regarding the revocation of license.

Mr. Morris Jr.—That is stating the import of the information.

THE COURT:—I think this is quibbling; the plaintiff was interrogated in regard to that. I will overrule the objection.

Mr. Morris Jr.—Note our exception. It calls for a conclusion and opinion of the witness.

A.—I had also available letters sent to headquarters office by persons relative to the plaintiff; I had also records of conversations and reports with persons relative to the plaintiff.

Q.—Now, Doctor, it is alleged in the complaint that this article was printed in the *Hygeia* of February 1938, and was that an original article for the February number of *Hygeia*? A.—The article appeared in two parts, the first part in January and the second part in February.

Q.—Now, we notice that the article in the January issue is headed, as counsel has shown, "Modern Medical Charlatans"; is the article declared upon and which is published in *Hygeia* for the following month, February 1938, a continuation of that series of articles on that subject? A.—It is.

Q.—Doctor, do you know John R. Brinkley in person? A.—No, sir.

Q.—Have you ever met Dr. John R. Brinkley before this trial? A.—No, sir.

Q.—Of course, you had never had any dealings with him? A.—No, sir.

Q.—What was your feeling toward John R. Brinkley before writing the article? A.—It is a part of my duty as editor of *THE JOURNAL* and of *Hygeia* that—

Mr. Morris Sr.—Just a moment, may it please the Court, that is argumentative.

THE COURT:—It is not responsive to the question.

Mr. Morris Sr.—Yes, but it is an attempted argument.

THE COURT:—Well, I sustain it. You will have to start over and answer the question. He asked you what was your feeling toward him. You are entitled to explain that, if you want to.

A.—My feelings would lie, from a scientific point of view, quite negative; in other words, for a period of approximately about twenty-five years, week after week, month after month, we have published articles describing various patent medicines, nostrums, charlatans and promotions in the field of health, and in the course of that work there came to our attention the performances of the plaintiff, and in accordance with the usual carrying out of the work it becomes necessary then to discuss the performances of the plaintiff along with others in the same field.

Q.—Well, did you have any personal animosity toward Dr. Brinkley? A.—No, sir.

Q.—Well, now, Doctor, there has been something said during this trial about eclectic physicians and what is an eclectic physician? A.—There have been from time to time in the practice of medicine various fields of medical practice devoted to special—

Mr. Morris Sr.—There may be some limitation, but the answer as it starts out is not responsive, it is just a continuation of the answer.

THE COURT:—Everybody can't speak in absolute terms of definition, and if he wants to tell us in his own way what eclectic is, he can do it.

A.—I might point out there was one school of eclectic physicians that existed 1,500 years ago, and that school of eclectics is, obviously, obsolete; more recently a school of eclectic was established about the time of the Revolutionary War of the United States, and it reached its height about

1850, and from that time on eclectic medicine began to decline, representing eventually a certain group of doctors that believed primarily in plant remedies and believing that for each disease there was a plant remedy; certain schools remain that teach that belief.

Q.—And one of those schools was the Kansas City Eclectic Medical College, is that right? A.—Yes, sir.

Q.—In this article there is some mention made by you of the plaintiff's activities in performing operations by the transplantation or implantation of goat glands in a human being, and from what sources did you obtain that information? A.—Most of the information from the pamphlets issued by the plaintiff himself, some of the information through personal visits to the state of Kansas and occasional conversations with persons who had been directly familiar with such transplants.

Q.—Now, there is also some mention made in the article of the plaintiff conducting the so-called medical question books, and from what source or sources did you receive that information? A.—I heard the plaintiff repeatedly as he made his radio broadcasts, and I had also opportunity to see transcripts of his broadcasts, and I was familiar also with the record of the appearances before the Federal Radio Commission.

Q.—That was in connection with the revoking of the plaintiff's radio broadcasting license? A.—That was in connection with the Federal Radio Commission's decision not to renew the license.

Q.—Now, there is a statement in the article declared upon in regard to the plaintiff's license to practice medicine in Kansas being revoked. A.—Yes, sir.

Q.—From what source did you receive that information? A.—The records of the Bureau of Investigation contain a complete statement relative to the revocation of the license in Kansas; I obtained information also regarding that from Dr. C. C. Nesselrode, who investigated the work of the plaintiff at first hand and also from Dr. J. F. Hassig, who is a member of the Kansas Board.

Q.—Who is Dr. Nesselrode? A.—Dr. Nesselrode is a physician in Kansas City, Kansas, who has himself for the Kansas Board witnessed an operation by the plaintiff in Milford, Kansas.

Mr. Morris Sr.—That is obviously the merest, rankest hearsay, and we move to exclude the statement.

THE COURT:—It may be that you know something more about it than I do, but it is my understanding that in these kind of cases the law is that a party accused of libel is entitled to state the sources where he got the information and what it was. I don't admit the statements of third persons for the purpose of proving the statements, but I admit it for showing that he received it from third persons, and if he wants to testify that he believed them and acted on them, I think it is proper evidence.

Mr. Morris Sr.—He testified he received it from Dr. so and so, who witnessed—

THE COURT:—It may be that he ought to say that Dr. Nesselrode told him.

Mr. Morris Sr.—Then, we have no objection to that.

A.—I will revise the statement that I received the statement from Dr. Nesselrode, who said he had witnessed the operation.

Q.—You believed that statement, did you, Doctor? A.—Yes, sir.

Q.—Now, I notice that in the article there is the statement in regard to the compound prostate operation of the plaintiff, and I will ask you from what source or sources you received that information? A.—I have read the records in which the Kansas State Board of Medical Registration received the report from Dr. Nesselrode on which basis that Kansas State Medical Board revoked the license, and the report of Dr. Nesselrode describing the four phase compound operation as given to Dr. Nesselrode, according to his statement, at the time when he watched the plaintiff perform the procedure on two patients.

Q.—Now, it is said here, as part of the article that I am referring to, that Dr. Brinkley has a high pressure man in his front office to make sure that those who come to the hospital will have the money to pay in advance for the work, and from what source or sources did you receive that information? A.—In the first place from a patient who, having submitted himself to a procedure by the plaintiff, later visited the Mayo Clinic in Rochester, Minnesota, and made a direct statement of his financial relationship at the time when he visited the plaintiff; second, from the repeated statements of the plaintiff in broadcasts as to the financial ability of those requested to come to his hospital.

Q.—Now, it says here, Doctor, "they are able to develop mortgages, loans, and conversion of securities in order to permit the patient to pay on the nail for what he is going to get," and from what source or sources did you obtain that? A.—From the statements of the patient already mentioned, and also from the statement of the business manager, I believe, who was here yesterday, for the present time; prior to that time from the statement made by this patient and the statements made on the radio as to the financial ability of those coming to the hospital.

Q.—And you believed those statements, did you, Doctor? A.—I believed that the plaintiff meant what he said when he said that he wanted them to be financially able.

Q.—Now, it says "most of the business, however, seems to come by way of the mail, and it is time for the Post Office Department to do something in regard to the use of the United States mails by John R. Brinkley in his defrauding of the public," and from what source or sources did you receive that information? A.—From listening to the broadcasts of the plaintiff on many occasions, and on one occasion in which the plaintiff said in my own hearing to the people to send him merely a bill with their name on a sheet of paper mentioning the name on a cast, but not to describe the symptoms, merely send the exact words, piece of paper with a bill; in fact, if I can remember the exact words, he didn't have time to go into the symptoms and that he would send a bottle of medicine that would be of help to them.

Q.—Now, it says here, Doctor, in your article "another of the Brinkley schemes is to sell to the patient who comes to his fair five ampules of his remedy for postoperative treatment at a cost of \$100. These the patient is supposed to take home in order that the contents may be injected into him by his selected doctor. When an analysis of the selected ampules was made, it revealed that they contained a solution of approximately 1 drop of indigo to 100,000 parts of water—about what you would get by throwing a bottle of bluing into Lake Michigan," from what source or sources did you receive that information? A.—Letters, as

I have said, come in many thousands to the headquarters of the Association from physicians and from the public inquiring about all medical matters in the public eye, and in the course of our work there came letters from several physicians indicating patients had returned to their home town bringing along—

Mr. Morriss Jr.—We object to the statement of the letters as not being the best evidence.

THE COURT:—Overruled.

Mr. Morriss Jr.—Note our exception. It is hearsay.

A.—Letters had come from physicians indicating their patients had returned home bringing along certain ampules, these patients requesting the doctor to inject the material into the patient as a part of the post-operative treatment; one physician stated definitely that his patient had said to him that he had paid \$100 for this material. These letters were sent to the Division of Drugs, Foods and Physical Therapy where Dr. Leech, as a previous witness has described, is director, and Dr. Leech requested the physicians to send the ampules, which have been produced in court, and these ampules were turned over by Dr. Leech to Dr. Schoeffel, who then made, as he has described, a series of tests to determine the content of the ampules; then, to describe the matter in such form that any one might understand the relative value of the contents of this ampule the description was made as reported in the statement.

Q.—Doctor, how did you conclude that this solution, which has been analyzed in the Chemical Laboratory and known as 1020, is about what you would get by throwing a bottle of bluing into Lake Michigan, as you stated in this statement? **A.**—The report was made by Dr. Schoeffel to Dr. Leech, who is the director of the laboratory and also a chemist, and Dr. Leech conferred with the director of the Bureau of Investigation, and the article published, as a majority of contributions are, many of our articles are, several of the authorities in the headquarters office contributing; and Dr. Schoeffel has shown that the amount of material in the ampule of a solid character was so infinitesimal as hardly to have any appreciable effect. Now, I didn't personally throw a bottle of indigo into Lake Michigan, but the analogy, I believe, is clear.

Q.—Now, Doctor, what is meant by the medical term "isotonic"? **A.**—An isotonic solution is a solution of essentially the same concentration in solid terms as the human blood, and hypertonic is one of greater concentration of solid materials than is the human blood, and hypotonic is one of lesser. If there is any further question, it is customary to inject isotonic solutions into the blood in order to avoid serious reactions. Hypertonic will produce a reaction in the blood, as will also hypotonic.

Q.—What result will hypotonic produce as compared with hypertonic? **A.**—It is associated with an inflammatory reaction of the blood vessel wall.

Q.—Do I understand you to mean that a solution that is injected intravenously should be isotonic? **A.**—Unless for some specific purpose the physician wishes to produce an inflammatory reaction, as he might, for example, in obliterating a blood vessel.

Q.—Now, it is said here in this article, Doctor, "the evidence assembled indicates that at various times Brinkley has made as much as \$55,000 a week from his various quackeries. He has been the possessor of three fine yachts," from what source or sources did you obtain that information, Doctor? **A.**—It evidently was brought out in the hearing before the Federal Radio Commission, and at that time there was a failure to renew the license, and there was something with reference to the annual income of the plaintiff; the question of yachts, and so forth, that is a matter of general knowledge, and it has been reported from time to time by various reporters and written up and described by them.

Q.—It says in this article, "he travels abroad and returns to this country in the finest suites on the finest boats, accompanied by his family and the little boy's tutor. On the vessel going and coming neither he nor Mrs. Brinkley engage in conversation with the passengers," and from what source or sources did you obtain that information? **A.**—From two sources: in the biography the statement is made definitely that in a previous visit abroad the plaintiff was shunned.

Q.—Is that the trip to China that was referred to here this morning? **A.**—That was here this morning, and the second source was the personal observation when I returned myself from abroad in August 1937.

Q.—You were on the same boat as Dr. Brinkley? **A.**—I was.

Q.—And that was on the *Normandie* was it? **A.**—Yes, sir, it was.

Q.—And that was about along in August 1937? **A.**—Yes, sir, it was.

Q.—Now, Doctor, in preparing this article for publication in the magazine *Hygeia*, did any one assist you? **A.**—The material was supplied to me by the Bureau of Investigation, by the Division of Drugs, Foods and Physical Therapy, by various divisions of our library department, where material is accumulated, the records having to do with medical licensure and the Council on Medical Education and Hospitals; the article once written, as all articles are, was then sent to an assistant editor or manuscript editor who reread and in spots re-edited the article; then the article went to the proof room where it was read in proof and returned, then, the article went to three associate editors, each of whom also read the article and made various suggestions, and the final article represents, therefore, an item written on my own responsibility, but, to that extent, with the assistance of others in the office.

Q.—And by article, you mean, Doctor, this entire series of articles in both the January and the February 1938 issues of *Hygeia*, do you? **A.**—Yes, sir.

Q.—And, of course, that series of articles, Doctor, refers to various people other than Dr. Brinkley, isn't that right? **A.**—Yes, sir.

Q.—What I mean by that, Dr. Brinkley is just one subject of a series of articles on a series of subjects; that is, he is one person? **A.**—Yes, sir.

Q.—Now, Doctor, it said in the article here at the beginning, "Without anything resembling a real medical education, with licenses purchased and secured through extraordinary manipulations of political appointees, and with consummate gall beyond anything ever revealed by any other charlatan, Brinkley has achieved an enormous success financially," and from what source or sources did you obtain that information for the article? **A.**—The sentence in question refers to several points. First, the point "without anything resembling a real medical education," an accomplished medical education as of the period 1910 or 1911 or 1912 included a year or two of college education, four years of medical education in a recognized medical school, what Mr. Petermeyer described, I believe, as a class A school. Next, the internship in a hospital recognized as suitable for giving an intern a reasonable amount of education and experience; the plaintiff had no such medical education, according to any records that are anywhere available. As to the enormous financial success, the records of the hearing before the Federal Radio Commission indicated the income of the plaintiff at that time, and he, himself, has testified as to his income during 1937—

Mr. Morriss Sr.—Evidently that, now, must be an argument, because he didn't have that testimony before him when he wrote the article.

THE COURT:—Yes, sir.

A.—According to the admitted ownership of three yachts and a hospital and the living habits of the plaintiff, it was apparent that his financial competence was considerable, at least as compared with that of the average physician, so that he might be said in comparison with the average physician to have made an enormous financial success.

Q.—What do you consider the average amount earned by a physician, as you have stated here?

Mr. Morriss Jr.—That would be incompetent and a conclusion and an opinion.

THE COURT:—Overruled.

Mr. Morriss Jr.—Note our exception.

A.—There have been reports as to the average income of a physician in the United States, at least three such reports, one made by the United States Government, one made by a committee on the costs of medical care and one made by the Bureau of Medical Economics by the American Medical Association, and all three reports agree that the approximate average income of a specialist in the United States is between \$6,500 and \$7,000 per year, and the average income of a general practitioner between \$3,000 and \$3,500 per year.

Q.—Now, while we are on the subject of specialists, what is a specialist in medicine? **A.**—A specialist in medicine is a physician who limits his practice exclusively to a single system of the body or to a single form of medical procedure.

Q.—What qualifications does a specialist ordinarily have? **A.**—A specialist usually has taken special studies in recognized clinics or institutions having to do with the special branch of medicine which he pursues; he is usually a member of recognized scientific societies which are voluntary organizations of the men devoting their attention to such work; he may be the possessor of the certificate of an examining board in the specialty, because there are examining boards which examine men who claim special competency, and they certify to the fact that these men are qualified as specialists.

Q.—How would I determine whether or not a doctor is a specialist? **A.**—If you were to consult the directory of the American Medical Association you would find the schools of graduation, the membership in various special medical societies and also a statement as to whether or not he possessed the certificate of the examining board in his specialty.

Q.—What are some of these specialists' societies that you have referred to, name them, please. **A.**—There are approximately 200 such specialist societies. Concerning the specialties which the plaintiff states to be his specialty, there are the American Urological Association and the American Association of Genito-Urinary Surgeons.

Q.—What is the American Urological Association? **A.**—The American Urological Association is a voluntary organization of some hundreds of specialists who specialize in diseases of the kidneys, bladder, prostate and in various genital urinary diseases.

Q.—And what is the other society that you named, the American Association of Genito-Urinary Surgeons? **A.**—That is an organization consisting of men who specialize in surgical operations on the genital urinary tract.

Q.—Now, Doctor, will you tell us, if you know, whether or not men, that is physicians who specialize in these particular branches of medicine, are ordinary members of such societies?

Mr. Morriss Jr.—That is incompetent, irrelevant and immaterial to establish any issue in the case, and we object to it for those reasons, and it would be hearsay, and as to this plaintiff there is not the proper criterion.

THE COURT:—Overruled.

Mr. Morriss Jr.—Note our exception.

A.—I would say that men recognized in the United States by their colleagues as competent in the field of urology and in the field of genital urinary surgery are usually members of these organizations.

Q.—Well, assume, Doctor, that the medical man holds himself out as being a specialist or a great urologist, would he ordinarily be a member of one or more of these societies that you mentioned?

Mr. Morriss Jr.—We object to that as going over into a field of speculation, and for all of the other reasons.

THE COURT:—Overruled.

Mr. Morriss Jr.—Note our exception.

A.—I would say that a man who has achieved prominence in the field of urology and in the field of genital urinary surgery is, in practically every instance, a member of one or the other, or both of these organizations.

Q.—All right, Doctor, now, this medical directory that you have mentioned as being printed and published by the American Medical Association, does that directory show by sign or symbol or in some manner the societies to which the medical men listed ordinarily belong? **A.**—It does.

Q.—So that a specialist or a man who holds himself out as a great urologist or a specialist, whose name is listed in that directory, if he belonged to either one of these societies it would be shown in that directory, wouldn't it? **A.**—It would.

Q.—So, in that manner you could obtain information as to any physician or surgeon as to the societies he belongs to? **A.**—I could.

Q.—By referring to the medical directory? **A.**—I could.

Q.—Now, Doctor, what proportion of the material used in compiling this article was received by you from the Bureau of Investigation, approximately what portion? **A.**—I would say approximately 70 to 75 per cent, three fourths of it.

Q.—Now, that bureau or department deals directly, doesn't it, with inquiries from people that write in regarding physicians? **A.**—Yes, sir.

Q.—That is, among other things, physicians? **A.**—Yes, sir.

Q.—And does the bureau keep a separate file for each of these physicians from whom—that is, of whom they have received inquiries? **A.**—It does.

Q.—Have you had a file on John R. Brinkley in that department for some time? **A.**—We have.

Q.—And is that department or bureau under your jurisdiction as editor of *THE JOURNAL* and as editor of *Hygeia*? **A.**—Not directly.

Q.—Well, is it connected in any way with the editorial department of these two magazines? **A.**—Yes, sir.

Q.—And in what way is it connected?

The witness then described the work of the Bureau of Investigation. The evidence proceeded:

Q.—Well, Doctor, before compiling this article, you didn't go out and investigate—

Mr. Morriss Sr.—Don't lead the witness.

Q.—I will ask you did you go out and investigate John R. Brinkley to obtain this material for this article? A.—I had at various times been in the state of Kansas, I had at various times been in contact with investigations of the plaintiff in Kansas, and to that extent my knowledge was personal.

Q.—But what I mean is, most of this information came to the Bureau voluntarily? A.—By far most of this material came to the Bureau voluntarily from people who were inquiring and who sent along the material on which they based their inquiry.

Q.—Now, before compiling the—that is, when assembling that information and before compiling this statement did you or did you not believe the facts that you incorporated in this statement to be true? A.—I believed them to be true and I do believe them to be true.

Q.—Did you or did you not believe at that time the facts that are incorporated in this statement, believe it was a fair and impartial report of the information you had available at that time? A.—I do.

Q.—And by that you mean in your official capacity as editor of the *Hygeia* magazine? A.—I write always in my official capacity.

Q.—Doctor, we have offered and there has been received in evidence various and sundry exhibits, and I believe you looked at them at the table and are familiar with them? A.—Yes, sir.

Q.—Are those exhibits, that is, those pamphlets introduced in evidence here today, exhibits 9 to 38, do they contain the information or some of the information that you incorporated in this alleged libelous statement? A.—Yes, sir.

Q.—And did you base the statements that you made, either in whole or in part, upon the information that is contained in those pamphlets and other documents introduced in evidence here today? A.—Yes, all information which is contained in the article which I didn't personally see or take part in is based on documents which were available at the time the article was written.

Q.—Now, tell us what is meant by the word "quack"? A.—A quack is a person who makes extravagant and blatant claims.

Mr. Morris Jr.—That is what he means by it, but that is a matter for the Court to charge the jury as to what is meant by a quack, and it is a question of law.

THE COURT:—There are a great many definitions of "quack," and inasmuch as this man's motive is under question here, he is being sued for an amount for malicious libel, I think he is entitled to say what he meant by saying that.

Mr. Morris Jr.—The test is not what he meant.

THE COURT:—No, sir, but the test is what the average person in reading the article thinks; and I will so instruct the jury.

Mr. Morris Jr.—Note our exception.

A.—It is my own conception of a quack: that a quack is a person who makes extravagant or blatant claims as to his ability in the field of medical science and in taking care of the sick.

Q.—Is that all? A.—That is the common, accepted definition, according to my knowledge of a quack.

Q.—Now, tell us what your definition of a "charlatan" is. A.—My knowledge of the word "charlatan" would take it to be in the vast majority of instances synonymous with the word "quack," and it means exactly the same thing.

Mr. Morris Jr.—The same objection.

THE COURT:—Yes, sir.

The witness described his interpretation of the term "recognized medical school" and the manner in which the American Medical Association investigates and lists hospitals.

The evidence proceeded:

Q.—How many lists of hospitals are published? A.—Three in the United States; one by the American Hospital Association, one by the American College of Surgeons and one by the American Medical Association.

Q.—By "lists of hospitals" what do you mean—describe it? A.—Hospital lists include what the American College of Surgeons calls acceptable hospitals; and the American Medical Association lists include registered hospitals and hospitals suitable for the training of an intern, and the American Hospital Association hospital list includes those holding membership in the American Hospital Association.

Q.—Do you know if the Brinkley hospitals are on the hospital lists that you refer to? A.—The Brinkley hospitals aren't on any of the lists.

Q.—Do you know if they have ever been on that list? A.—To my knowledge they have never been on any of the lists.

The jury was then excused from the court room, and the Court discussed with the attorneys the question of the admissibility of evidence as to the Brinkley marriage and divorce.

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Dr. Fishbein resumed the stand, and there was offered in evidence a deposition by Dr. Nesselrode, having to do with his witnessing an operation performed by Brinkley in Kansas. Dr. Fishbein stated the extent to which he remembered the statements made by Dr. Nesselrode and also the deposition.

The evidence then proceeded:

Q.—Now, Doctor, you heard the testimony yesterday of the chemist here in regard to his analysis of form 1020? A.—I did, yes, sir.

Q.—And were you previously familiar with that analysis, doctor? A.—I was.

Q.—And for how long a time have you been familiar with that? With that analysis made by this chemist? A.—Since the time when it was completed.

Q.—Well, did you read his analysis or consider it? A.—I did.

Mr. Morris Jr.—We object to that, and we ask that all of the testimony be stricken because it appears from something in writing, and we object to it as not being the best evidence.

THE COURT:—He simply asked him if he read it. The chemist testified yesterday to his analysis and the fact that it was given to Dr. Fishbein.

Mr. Morris Jr.—But we are now getting at it, sir, and the doctor is attempting to testify what information he had before him and that was by a report in writing.

THE COURT:—I will overrule that portion of it. I think it is too technical.

Mr. Morris Jr.—Note our exception.

Q.—Now, Doctor, will you tell us in plain words so that we can all understand it what ingredients of one of these ampules or the ampules, the contents of which were analyzed by the chemist, just tell us in plain words what they were.

Mr. Morris Jr.—He couldn't do that. At most he can say what the other man told him and inasmuch as the report is in writing, and it is the best evidence—

THE COURT:—The chemist sat up here and told us what he found in the ampule and the doctor heard him do it, and any doctor could be asked to state in plain words what it was, if he knew.

Mr. Morris Sr.—If he was asked if he knew.

THE COURT:—You heard the chemist say what was in it and Dr. Fishbein heard him say it, and he could ask him that way, assuming that the ampule had in it what Dr. Schoeffel said in plain words, what it is. The testimony of Dr. Schoeffel was so highly technical it was difficult for the Court or the jury to get it.

Mr. Morris Sr.—But the witness's testimony must stand for itself and it must not be explained by anybody else, that is the usual rule.

THE COURT:—Whenever a witness gives evidence of a highly technical nature other witnesses can tell what it is in plain words so the jury can understand it. I will overrule the objection.

Mr. Morris Sr.—Note our exception.

A.—The analysis indicated that the contents of the ampule, which was the little glass bottle, was essentially 20 cc. of fluid, and 1,000 cc. makes a liter, and a liter is about a quart, and it contained approximately 20 cc., which is, as you can see, one fiftieth, or less, of a quart. This was essentially of the character of distilled water, except for an infinitesimal, a very tiny amount of coloring matter, very small indeed, in fact, so small it was necessary to have the services of a microchemist, which is a chemist that deals in very small materials, of which Dr. Schoeffel is one of ten, to make an analysis of small materials that were said to be in the solution, and he also found traces, as shown by the use of spectroscopic technic which is a technic in which one burns a certain amount of solid matter and causes the light to pass through a prism and then it distributes a colored scale on a chart, and on that technic he discovered a very small amount of halogen, and this was chlorine, about the same as common table salt, which is a contamination of the dye substances in the indigo field; and inasmuch as it was indicated that the ampule was said to contain a very minute amount of hydrochloric acid a search was made for that substance, but the indication of the presence of that substance was so minute that the explanation was offered that the walls of the glass had absorbed, perhaps, most of that substance, so that what the patient got exactly was a solution of the distilled water with an infinitesimal amount of dye substance and halogen or chlorine substance. Is that clear?

Q.—Yes, sir. Doctor, there have been many questions asked here the information to cover which has been taken from a book entitled "The Life of a Man," and I think it is by Clement Wood; in other words, a biography of John R. Brinkley, and I will ask you if before preparing this article you read the book "The Life of a Man"? A.—I read a copy of the book which was sent to me inscribed by the author as a presentation.

Q.—Now, Doctor, will you tell us what the common custom and practice among physicians in the United States is with regard to advertising, and I will say advertising in the field of medicine? A.—It is the common custom of physicians in the United States not to advertise their qualifications, their services or the price of those services in any way to the public.

Q.—And why is that, Doctor,

Mr. Morris Jr.—That would be a conclusion, if the Court please, on the part of the witness.

THE COURT:—He can state his opinion.

Mr. Morris Jr.—We think it is an improper conclusion and an opinion, and we object to it as such.

Mr. Harrell—I submit, your honor, the witness has already testified and qualified as an author on medicine.

THE COURT:—I will overrule the objection.

A.—The common custom among physicians almost since time immemorial is to abstain from advertising, as described in the innumerable books, as well as in my own opinion, for the protection of the people, since it should be apparent at once that the physician who advertises and states in his advertising exceptional qualifications which he may or may not possess, and since there is no regulation of the physician's consideration character, the step would be to bring to the physician's consideration numbers of people who would come, not because of merit of his work, but primarily because they believed his own statement as to his special qualifications or to the fees which he charged and said to be more or less, for example, than the fees of other physicians, or as to the results he had secured, which, of course, the public would have no way of knowing had actually been secured or hadn't been secured, and, then, the custom established by use of practice among physicians is that the relationship of the doctor to the patient is such that the doctor must not vaunt his special qualifications, the fees he charges, the nature of his services, in any way to the public.

Q.—Doctor, what is the custom and practice among the physicians and in the medical fraternity in the United States with reference to new discoveries of medical science or new discoveries in surgery and surgical technic in the performing of operations?

Mr. Morris Jr.—We object to that as immaterial and irrelevant to any issue in this case.

THE COURT:—Overruled.

Mr. Morris Jr.—Note our exception.

A.—It is a precedent among physicians which has existed since time immemorial, that inasmuch as the public health is of the greatest importance for the advancement of the people and the nation, a doctor shall give freely of his new discoveries or of his operations such or of his knowledge to all of the medical profession the moment such discoveries are established in order that as many people as possible may be benefited by the discovery, and with the definite understanding that the doctor shall not personally derive a profit from his discoveries or from his inventions; thus physicians publish descriptions of new or from his operations and new discoveries in the field of medicine as drugs, new operations and new discoveries in the field of medicine as soon as they are established in order that other physicians may know of these methods and be able to duplicate them for the benefit of the sick.

Q.—Doctor, can you tell us if Dr. Brinkley has ever revealed or has published for the benefit of the medical profession his surgical technic for this new operation he refers to, or has it been submitted to the profession for criticism? A.—As far as I know it has never been published in any medical periodical, nor has it been generally submitted to the criticism of the medical profession.

Q—Doctor, would you tell us, if you know, how many states of the union recognize graduates in medicine from eclectic colleges? A—At the last report, which was officially published, the particular college in Kansas City, the Eclectic—the College of Eclectic Medicine and Osteopathy, wasn't to my knowledge recognized by forty seven of the forty eight states in the union; in other words, there was only one state which recognized that diploma.

Q—What state was that? A—The state of Arkansas.
The cross examination follows

CROSS EXAMINATION

By Mr. Morris Sr

Q—But, of course, that didn't mean that if they were licensed to practice they couldn't practice in those states, notwithstanding that they had taken that course of study among others? A—It meant they couldn't practice in any state of original jurisdiction over the first examination, in some instances.

Q—I didn't ask you that, and will you please make it a practice instead of going into the long answers just answer my questions yes or no, as far as possible. A—Yes, sir.

Q—I say that didn't mean if they had a license he it that they had made a study of that as well as other systems, they couldn't practice anywhere and the fact that they got a license or diploma from the Eclectic College didn't bar them from practice otherwise? A—It would bar them from practice in some states.

Q—Regardless of whether they qualified otherwise? A—It would bar them.

Q—Notwithstanding the fact they passed the other qualifications for getting a license, the mere fact they got a diploma in the Eclectic College would bar them, is that your testimony? A—The question is not clear.

Q—Supposing they studied other systems and qualified themselves and could take the examinations and pass the tests, the mere fact that they had gone to the Eclectic School at one time would bar them, is that your idea? A—A license requires—

Q—Answer the question yes or no. A—It can't be answered that way.

Q—The mere fact that they had once studied at this eclectic school, would that bar them? Answer that yes or no. A—It might bar them.

Q—Would it bar them? A—It would bar them in many states.

Q—Necessarily, the mere fact they had studied that system? A—Not the system, the school.

Q—Suppose that some doctor had studied at various schools and the various systems approved in those states—

The Court—Counsel, in order to bring this matter before us, why suppose all of those things if there is no evidence to support it? Dr Brinkley's testimony is that he studied for three years at a school in Chicago and then he quit for several years, and then went back and took a year's course in the Eclectic School. Is it the claim that he went anywhere else?

Mr Morris Sr—Yes, sir.

The Court—He never said so in the evidence.

Mr Morris Sr—It could be shown that he studied elsewhere.

The Court—Why suppose the things if there is no evidence to support it?

Mr Morris Sr—I am getting the viewpoint of the witness, is all.

The Court—I know, but it would take too wide a range and I want to confine it to the evidence.

Mr Morris Sr—I am not going to take a wide range.

Q—Would the mere fact that some doctor had studied at other schools and could pass any examination, would the fact, in the interest of science, that he had gone down and taken a course there, would that bar him in other states? A—It would bar him in some states.

Q—That is your idea? A—That is the truth.

Q—Have you ever practiced medicine? A—Yes, sir.

Q—When? A—I have practiced medicine for the period from the time of my licensure—

Q—When was that? A—In late June 1912, until the time when I became assistant to the editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Q—When was that? A—Which was in late August 1913.

Q—You mean you practiced medicine, then, how long? A—Slightly over one year.

Q—You practiced medicine slightly over a year where? A—In the city of Chicago.

Q—Whom did you office with? A—I was at that time—do you want my program day by day?

Q—No, sir, just whom you were officing with? A—Dr. Hektoen, and I was also associated with Dr. George H. Weaver and Dr. George F. Dick.

Q—Now then, as a beginner you practiced about a year? A—That is about all.

Q—And that is all the medical practice you have ever had? A—No, sir.

Q—You have never been an active practitioner from that time on?

A—You mean offering my services for pay?

Q—Yes, sir. A—No, sir.

Q—You have never done that since then? A—No, sir.

Q—That was from 1912 until some time in 1913? A—Exactly.

Q—That you were offering to practice medicine? A—Yes, sir.

Q—And, then, you became an employee with the Medical Association?

A—I became assistant to the editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Q—That was employment, wasn't it? A—Yes, sir.

Q—And, then, you have been with the Medical Association ever since then, is that right? A—Yes, sir.

Q—And you have been editing this *Hogea* how long? A—Approximately fifteen years.

Q—And THE JOURNAL about the same time? A—No, sir, longer on THE JOURNAL because as assistant to the editor I began taking control of THE JOURNAL somewhat longer ago than that.

Q—And who was President of the Medical Association when you began with it? A—The Medical Association elects a new president elect every year, but the presidents change every year and I would have difficulty in remembering exactly who was president each year, but I can give you a list of many of the presidents.

Q—I asked you the question who was the President when you started with the Medical Association, and if you don't know, say so? A—I don't remember exactly, that year.

Q—When was Dr. Simmons President? A—Dr. Simmons was never President.

Q—What was his connection? A—Dr. Simmons was editor and general manager of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and of the work of the association.

Q—What Simmons is that? A—George H. Simmons.

Q—He, I believe, had been an advertising doctor? A—I don't know.

Q—Well, you have seen many of his advertisements, haven't you?

A—No, sir.

Mr Harrell—I object to this line of testimony; I don't see where it has any place in this case. Dr. Simmons is not on trial here, and it has nothing to do with this case.

The Court—This is cross examination, and it was brought out by you on direct examination that ordinarily ethical doctors don't advertise, and they can test him out on that if they want to.

Q—You have read this book, "Medical Mussolini"? A—I have seen it, yes, sir.

Q—You have noticed the advertisements on page 22? A—I have noticed what purports to be an advertisement.

Q—You don't deny those are copies of Dr. Simmons' advertisements? A—I merely state that purports to be a copy. That is the only one I have seen.

Q—You don't deny those are some of the advertisements of Dr. Simmons? A—I don't know of my own knowledge.

Q—You do find it in a published book? A—Yes, sir.

Q—And, by the way, Doctor, you wrote a book and advertised it, Doctor, a book of home remedies, you wrote a book yourself and advertised that in the Chicago Tribune, didn't you? A—No, sir.

Q—You didn't? A—No, sir.

Q—Didn't you publish a book? A—I wrote a book, but I didn't publish or advertise it.

Q—You mean to say there wasn't an advertisement in the Chicago papers? A—There may have been advertisements, but I didn't pay for or issue the advertisements.

Q—You know there was an advertisement for the sales for "Home Remedies" in the Chicago papers? A—Not for "Home Remedies."

Q—You know there was considerable furor and criticism among some of the American Medical Association doctors about that very episode?

A—There was some excitement, yes, sir.

Q—Now, Doctor, when you wrote that article about Dr. Brinkley you say you had never met him? A—I had never met him to my knowledge, no, sir.

Q—Do you know whether he had gone to the same school you went to? A—I never to my knowledge went to any school that he went to.

Q—Do you know whether he did—you don't know that, whether he did or didn't? A—To which school do you refer?

Q—Either one of the schools that you went to? A—To my knowledge he never at any time was enrolled as a pupil in the University of Chicago or the Rush Medical College.

Q—Do you know whether you had ever had opportunity to meet him and know him before you wrote this article? A—I don't know that I had ever had any opportunity to meet him, certainly not to my seeking.

Q—You are quite positive you had not, so far as you know, had any opportunity to meet him? A—No opportunity of my seeking.

Q—I didn't ask you that, I asked if you know whether you have ever been thrown in the same place he was? A—I wouldn't know of it. I don't know.

Q—You know that just a few months before you wrote this article you came over on the boat from Europe, on the same boat with him and had quarters on the same deck, I mean the same floor of the boat?

A—As far as I know there was no opportunity for me to meet Dr. Brinkley on the boat.

Q—So far as you know? A—Yes, sir.

Q—Isn't it true that Dr. Brinkley made an effort to meet you, and you were out on the deck, and you were sitting there reading a book and he walked around in front of you and you looked up and then you dodged back in the book and refused to recognize him or know him or meet him? A—The question was did I have opportunity to meet him, and the answer is I didn't have any opportunity to my knowledge to meet Dr. Brinkley.

Q—That is not the question. A—Define the word "meet."

Q—I asked if he and Mrs. Brinkley didn't come around to where you were sitting in a chair reading, and you refused to look up and notice him? A—To my knowledge on one occasion he walked by the place.

Q—Answer the question.

The Court—I think he was answering it.

A—I am answering the question directly, and completely.

Mr Morris Sr—I asked didn't he walk by, and I asked that he answer it yes or no.

The Court—I think he is answering the question and you stopped him.

Mr Morris Sr—I asked him to answer it yes or no, and I have that right to have him answer it that way.

The Court—I don't think so, I think some questions can be explained.

Mr Morris Sr—Well, he can explain it later.

The Court—I don't think you can fairly conduct that examination in that way.

Mr Morris Sr—I will ask it in another way.

Q—Did they walk in front of you and stop in front of you as if to meet you? A—They walked in front of me, but I don't recollect that they stopped.

Q—You don't recollect? A—That they stopped.

Q—Who are they? A—Dr. and Mrs. Brinkley.

Q—Do you know it was them? A—Yes, sir.

Q—You did? A—Yes, sir.

Q—You knew they were on the boat? A—Yes, sir.

Q—You were on the boat, then, with them, how many days? A—I think slightly over four days.

Q—And did you know that your daughter, who was on the boat, had been playing games with Mr. Brown, the witness who testified, did you learn that at the time? A—At the time my daughter stated to me that while she was practicing golf in the golf net—

Q—I am not asking what she told you. A—My only information is what she told.

Q—Answer this question yes or no. Did you learn they were playing together? A—My daughter said so.

Q—Answer the question yes or no. Did you know they were playing together? A—My daughter didn't say they were playing together.

Q—Answer the question—

The Court—He said his daughter—

Mr Morris Sr—I asked him to answer the question yes or no.

There is no need for the witness to be stubborn in answering the question yes or no, and I have that right to that answer.

A—If the question is "did I learn they were playing together," then the answer is "no."

Q—Did you learn she had met him or had been associated with him on the boat? A—I learned that he had approached her.

Q—Did you learn that there had been anything more than just his approaching her? A—Some conversation.

Q—Some conversation? A—Yes, sir.

Q—On her part or his? A—Apparently mostly on his.

Q—Apparently mostly on his? A—Yes, sir.

Q—Did you learn at the same time that he—or at a later day on the boat—that he was a tutor of Dr. Brinkley's son? A—I learned that.

Q—You did? A—Yes, sir, I did.

Q—Then did you learn that Dr. Brinkley's son had been playing games with her, with your daughter? A—I didn't.

Q—With the boy, I mean, your boy? A—I did not.

Q—Did you learn that Dr. Brinkley's son was on the boat? A—I did.

Q—You did know that Dr. Brinkley and his family and the tutor were on the boat, did you? A—I did.

Q—And how many days did you say you were on the boat with him? A—Slightly over four days.

Q—Was there another instance when you met them face to face and turned back and turned away? A—Possibly on the day when the boat was docking.

Q—Was there another instance after you got off of the boat when you came upon them and turned and went away? A—I believe at the Hotel Waldorf.

Q—So, you didn't only not seek him, but you avoided him and evaded any opportunity to meet them or any opportunity for them to meet you? A—Yes, sir.

Q—You had years previously published in one of these magazines an article about the doctor? A—Yes, sir.

Q—And that was an article similar in many respects to the present article, wasn't it? A—Yes, sir.

Q—And then you had published in January 1938 the article, I mean the publication mentioned, of Dr. Brinkley, hadn't you? A—Yes, sir.

Q—This was what you told your counsel was a part of a series of articles, wasn't it? A—Yes, sir.

Q—Under the large caption "Modern Medical Charlatans"? A—Yes, sir.

Q—Now, in January of 1938, you published this about Dr. Brinkley: "In the obscure Kansas village of Milford, a blatant quack, one John R. Brinkley, whose professional record reeks with charlatanism of the crudest type, has for some years been demonstrating the commercial possibilities of gonad gland grafting for alleged sexual rejuvenation," didn't you? A—Yes, sir.

Q—In that article you inveighed against those beliefs and practices that you oppose, is that right? A—Yes, sir.

Q—Among other things, you stated in that article this, did you not: "The chronic invalid, weak, despairing, eager for comfort responds more readily to the laying on of hands"? A—Yes, sir.

Q—"As a result, there are legends in every religious history not only of healing but of raising from the dead by such procedures. In ancient days, men were not sufficiently familiar with the scientific tests of death to ascertain with certainty that people in a comatose state were not actually dead but living. It is quite possible for the hysteric to imitate the signs of death. It is also quite possible by the power of suggestion to cause such a hysteric to discontinue the symptoms and apparently to rise from the dead," you published that, too, didn't you? A—Yes, sir.

Q—In other words, among other things, that was a part of your belief, wasn't it? A—Yes, sir.

Q—And then, in the February issue you hadn't had any word from Doctor about your January issue, had you, when you published the February issue? A—Not that I know of.

Q—Then you published in the February issue this account, which has been read to the jury, is that right? A—Yes, sir.

Q—Do you remember when you wrote it? A—I wrote the article, I believe, in the previous September or October or possibly November, I would have to verify my records on that.

Q—When was it after you got back off the boat trip? A—I reached my office about the second week in September; the article was written to read before the Chicago Literary Club in November.

Q—We are not asking about that, and don't go off on irresponsible matters that you know necessarily extends this record. You got back about the middle of September, is that right, from the boat? A—In my office about the first week of September, I believe.

Q—Then, it was a few days later that you began writing this article? A—Much later.

Q—How much later? A—I believe about the third or fourth week in October.

Q—Just within a few weeks after you got back, at any rate, you began writing these articles about Dr. Brinkley? A—Yes, sir. Not about Dr. Brinkley but about modern charlatans.

Q—He is in there? A—He is included.

Q—You began writing about Dr. Brinkley a few weeks after you got back off of the boat, A—Six or seven.

Q—You had had some days to discuss with Dr. Brinkley his methods, had you wanted to? A—Had I wanted to, yes, sir.

Q—Had you ever come to Del Rio in the years from 1933 to 1938 to get first hand information and first hand knowledge of Dr. Brinkley's operations and practices and hospital? A—No, sir.

Q—You had never made any investigation at all? A—Personally, no.

Q—Had you ever made any request of him for information? A—Personally, no.

Q—In other words, you had never even been to Del Rio before you wrote this article? A—No, sir.

Q—Never made any effort to contact Dr. Brinkley? A—Personally, no, sir.

Q—You had never made any effort to learn of him about his practice and his operations or his reasons for it, or anything about that, had you? A—I made no personal effort.

Q—Did you ever consult any of these doctors who had worked for him and operated with him here—did you ever consult Dr. Petermeyer? A—No, sir. He is an osteopath.

Q—Did you ever consult Dr. Petermeyer? A—No, sir.

Q—Dr. Davis, did you ever consult him? A—No, sir.

Q—Did you ever consult Dr. Osburn? A—No, sir.

Q—Dr. Conn? A—No, sir.

Q—Dr. Harris? A—No, sir.

Q—Dr. Kline? A—No, sir.

Q—You said Dr. Petermeyer was an osteopath? A—Yes, sir.

Q—You referred to him on the stand yesterday as "Mister," instead of "Doctor"? A—Yes, sir.

Q—You don't recognize him even as a doctor? A—I, personally, do not.

Q—And you say you never wrote a letter to any of these men, never interviewed them, never made any effort to interrogate them or learn anything from them about Doctor? A—Not that I know of.

Q—Tell us whether you did? A—I don't remember that I did.

Q—If you did, you would remember, and would you tell us whether or not, in your best judgment, you made any direct effort to ascertain any facts from any of those men? A—No, sir.

Q—Nor from Doctor? A—No, sir.

Q—Nor any employee or nurse of his hospital? A—Not personally.

Q—You say not personally, but did you send somebody here to Del Rio to ascertain about him? A—Various investigations have been made.

Q—I didn't ask you that. A—If I personally sent—no.

Q—Did you personally have anybody come to Del Rio to make any investigation about it? A—No, sir.

Q—And did you ever ask an opportunity to witness one of these many operations that have been shown that he performed here on people? A—No, sir.

Q—And you told us yesterday that the information you got, so far as any patient was concerned, was a second hand report about some one patient who had gone to Mayo? A—That had to do with financial matters not the operation.

Q—That is the only patient you contacted, wasn't it? A—Personally?

Q—Yes, sir. A—Yes, sir.

Q—So you never made any inquiry from any patient whether he was satisfied or helped or benefited or cured or injured, did you? A—Some of the patients wrote to me.

Q—I am asking you if you made any personal contact with or any investigation of any patient? A—No, sir.

Q—You didn't make any effort to, did you? A—Personally?

Q—Yes, sir. A—No, sir.

Q—And did you have anybody make any investigation here in Del Rio about what he was doing in reference to the literature that he was sending or receiving or the letters he was sending or receiving, did you send anybody to Del Rio for that purpose? A—Personally?

Q—Yes, sir. A—No, sir.

Q—You didn't do it yourself or have anybody do it, did you? A—Not personally.

Q—And, yet, in this article you charge him with being the arch quack of all quacks, the arch charlatan and charging him with using the mails to defraud, didn't you? A—All investigations—

Q—Answer the question yes or no. A—All investigations—

Q—Answer my question. You charged him with that, didn't you? Answer that question yes or no. A—I charged him with that, yes, sir.

Q—Without any character of investigation? A—No, sir, that is not true.

Q—Do you disclaim malice? A—Yes, sir.

Q—You disclaim it, do you? A—Yes, sir.

Q—You just had the very kindest feeling for him, didn't you? A—I had no feeling for him at all, one way or the other.

Q—Why did you decline the opportunity time after time—A—In some twenty six years of investigations of charlatans, I have never met personally or sought the acquaintance of any charlatan.

Q—In other words, you are now asserting to this jury that he is a charlatan, in your opinion, is that right? A—Yes, sir.

Q—And in your answer you alleged the truth of the publication? A—Yes, sir.

Q—On the stand you are claiming the truth of the publication, aren't you? A—Yes, sir.

Q—Now, are you in any way committed by any authority, government or other authority with the power to say who may practice medicine in the United States and who may not? A—No, sir.

Q—You are not? A—No, sir.

Q—Do you set yourself up to? A—No, sir.

Q—When did you first read this article which charged you—the book which charged you with attempting to be the Mussolini of Medicine in America? A—I read that about, I think, the first time a month ago maybe.

Q—And shortly before that there was great controversy and furor in the medical profession about a good many of your methods wasn't there? A—No, sir.

Q—H hadn't there been a great deal of dissension about it so much so that you have had some trouble up at Washington lately that is due to some of your practices? A—No, sir.

Q—I am going to ask the question, and I don't want you to answer it until counsel makes the objection. You were recently indicted in the Federal Court in Washington, and you are under indictment now? A—Yes, sir.

Q—And that was due to your methods, what the many doctors called your high handed methods in dealing with and trying to control the medical profession? A—No, sir.

Q—You disclaim that? A—Yes, sir.

Q—The indictment was against yourself and the Medical Association for violation of the anti trust laws, wasn't it? A—No, sir.

Q—What was it? A—The indictment involved twenty physicians practicing in the District of Columbia, and five employees of the American Medical Association, there was no indictment of the Association as such.

Q—What about you? A—I was one of the five employees of the Association.

Q—You were indicted? A—Yes, sir.

Q—And what was that indictment for, against you? A—The indictment had to do with the fact that certain hospitals in the District of Columbia—

Q—Answer the question, what was the charge made?

THE COURT—He was answering the question. I very much doubt the admissibility of this line of evidence, anyhow.

MR. MORRIS Sr.—I gave counsel opportunity to object.

THE COURT—He didn't object because he didn't mind it, but from the Court's standpoint the evidence is inadmissible, I think it is prejudicial and if any objection was made I would sustain it.

MR. MORRIS Sr.—I gave him the opportunity.

THE COURT—You gave opportunity to object to all questions that are improper. We can't try the case in Washington.

MR. MORRIS Sr.—I realize that, but—

THE COURT—I think you better discontinue this line of testimony.

MR. MORRIS Sr.—My thought was only with reference to his activities.

THE COURT—He is not being tried in regard to that. I have no doubt that he has his side of that thing in Washington. Gentlemen of the Jury, you will disregard all of that with regard to this indictment, it has nothing to do with this case and is a collateral issue, and you have no business to try to try it out, and you must discard it from your mind and I mean for the jury to do that, because otherwise I owe it to the Dr. Fishbein the duty of letting him explain his side of it to you, but it imputation has been cast, and I have no doubt that he has a side, but it isn't material and you are not interested in it, so you will not discuss that matter in regard to the indictment or refer to it or carry it in your minds, just discard it from your minds.

Q.—What I want to bring out, Doctor, is that there is existing an element of opposition and rebellion against your methods in the American Medical Association, is there not? A.—The only way I would have of knowing that would be a breaking off of some part of the membership; as I explained yesterday the membership has increased by 8,000, and no one of those said to be in rebellion has resigned.

Q.—And, yet, there are many, many thousands of physicians throughout the United States who have been members in the past and who are not now? A.—No, sir.

Q.—You don't mean to say there are many thousands? A.—No, sir, certainly not.

Q.—On the first of January 1938, after you had written and before you had published this article, there were 50,000 physicians in the United States that were not members of the Association, weren't they? A.—No, sir, not one.

Q.—Can you give me the exact figures? A.—I can give you the exact figures.

Q.—Physicians licensed to practice? A.—165,000 physicians in the United States licensed to practice.

Q.—And you said yesterday there were 111,000 members now? A.—Yes, sir.

Q.—But there were 8,000 less the year before? A.—No, sir; that was in June 1937.

Q.—So, there are approximately 50,000 licensed physicians not members of the Association? A.—Yes, sir.

Q.—And you know that at one time Dr. Brinkley was a member of the Medical Association, don't you? A.—I haven't personally investigated that point, so I wouldn't want to say yes or no.

Q.—Do you attempt to deny that Dr. Brinkley was for some years? A.—I don't attempt to deny it, I merely say I do not know of my personal knowledge.

Q.—You told us yesterday of the investigation, rigid rules and investigation as to qualifications to become a member? A.—Yes, sir.

Q.—Then, if Dr. Brinkley was a member for some years, then, that investigation had been made of him and he had been passed, hadn't he? A.—I would have to verify that, and, I can verify it if you wish, by telegram.

Q.—I am asking if Doctor had been a member for some years, why, he had passed that investigation and been approved? A.—If he had been, why, he had, yes, sir, probably.

Q.—Now, do you not know it was only after his experimentation and his operations and his work in the attempted use of glands that the medical profession raised a furor and he was expelled from the Association? A.—I don't know that of my personal knowledge.

Q.—Well, you would know it from the information because you were there, connected with the American Medical Association, weren't you? A.—I don't keep in my mind the personal lives of the entire 111,000.

Q.—Then, you wrote this article charging Doctor with being a quack and unqualified and so forth, without looking up to know whether he had even been a member for years of the American Medical Association, or not? A.—For every statement made in the article, I had—

Q.—Just a moment, please, just answer the question, and don't argue the matter with me, just answer the question. A.—What is the question?

Q.—You wrote that article without any investigation to see whether for years he had been a member of the Medical Association, or not? A.—That information I didn't have before me.

Q.—And you didn't look it up? A.—I did not.

Q.—And, now, with reference to the matter of Doctor having been earnestly seeking to put his new ideas and his new experiments in medical—his new research and the results of it to the medical profession—you told us that when a man has a new idea that he thinks is beneficial he tries to give it to the public, is that right? A.—He submits it to scientific periodicals.

Q.—Doesn't he give it to doctors and call them in, noted doctors? A.—Yes, sir.

Q.—You did know he had, among his early operations, called Dr. Nesselrode? A.—Yes, sir.

Q.—He had called Dr. Nesselrode in to witness the operation, hadn't he invited him in, and you learned from the doctor that he had been invited in to witness the operation? A.—He invited him in connection with the revocation of the license, that is all I know.

Q.—Didn't he invite him to witness the operation? A.—In connection with the revocation of the license.

Q.—That is the qualification you are putting on it now? A.—That has always been the qualification.

Q.—Did you say anything about that a while ago? A.—Yes, sir.

Q.—You testified in answer to that to your counsel? A.—Yes, sir.

Q.—You testified that it was in connection with some matter of investigation or in revoking the license? A.—Yes, sir.

Q.—You had already told that, had you? A.—Yes, sir.

Q.—At any rate, you know that when the matter was questioned why, then, at least, at that time, if not before, he invited that doctor in to witness his operation? A.—Yes, sir.

Q.—You do, as a matter of fact, from common report, know that he called many doctors in to witness the operation, don't you? A.—I do not.

Q.—You know he traveled far and near to perform the operation and demonstrate it to the public and doctors? A.—No, sir.

Q.—Did you know from information that he performed it in many places? A.—No, sir.

Q.—Or various places? A.—No, sir.

Q.—You don't know about that? A.—No, sir.

Q.—You didn't consult Doctor before you wrote this article to learn whether or not it was his earnest desire to help ailing humanity when he did that experimentation? A.—I heard him say that on the radio.

Q.—You didn't consult him about it to find out anything about his views on it? A.—No, sir.

Q.—With reference to the operations that he performs now in the main, which is this prostate operation, you never wrote him nor questioned him nor interviewed him to find out his views, his own personal views about the benefit and the need of that, did you? A.—No, sir.

Q.—Nor the good of it, and you have told us as to those operations—and neither did you talk to any patients of his? A.—No, sir.

Q.—Are you prepared to say, then, you never witnessed that operation? A.—I never witnessed the operation.

Q.—Either by him or anybody else? A.—No one else does it, I believe.

Q.—You don't deny that many doctors perform that operation that he performs now days, do you? A.—I don't know of any doctor who transplants goat glands.

Q.—I didn't ask you that. A.—That is what the article says.

Q.—In the article you say he discontinued that? A.—Yes, sir.

Q.—You knew at the time he discontinued that operation years before? A.—Yes, sir.

Q.—All right, now, I am talking about the operation that he principally performs now on sick men, the prostate operation? A.—Which prostate operation?

Q.—The prostate operation which you heard Dr. Petermeyer describe, A.—May I ask if you refer to the operation involving the injection of mercurochrome or the prostate resection by the introduction of the tube into the urethra?

Q.—I refer to both, but primarily the first. A.—I know few, if any, doctors who practice the operation that involves cutting the vas or tube and injecting mercurochrome.

Q.—Don't you know that doctors throughout Texas are doing that operation? A.—I don't know of any well recognized urologist who does that operation.

Q.—Do you know any of the doctors of San Antonio? A.—I know quite a few doctors in San Antonio.

Q.—Do you know whether any of the doctors in this region, any doctor in this region performs that operation? A.—In Del Rio?

Q.—Yes, sir. A.—I know very little about the operations done in Del Rio in general.

Q.—In other words, you don't know, then, whether doctors who have had the best opportunity to investigate and to see and talk with patients and learn the results, and so forth, have gone to performing that operation or not, do you? A.—Will you restate the question?

Q.—In other words, you don't know, then, whether doctors who have had the best opportunity to investigate and see and talk with the patients and learn the results, and so forth, have gone to performing that operation or not, do you? A.—That is a complicated question. In general, I know very little about whom the patients of Dr. Brinkley have gone to next.

Q.—Do you know anything—have you read anything, I will put it, in the medical journals about this type of operation? A.—I have read about various types of operations on the vas.

Q.—Now, then, do you not know that the second operation where, as Dr. Petermeyer said, the condition is so bad as to preclude the probable benefit by the first operation, that is, the urethral operation, that is commonly performed by many doctors all over the country, isn't it? A.—I didn't understand from Dr. Brinkley's broadcasts that he performed that operation.

Q.—I didn't ask you that. A.—You mean the operations performed by Dr. Petermeyer?

Q.—You heard Dr. Petermeyer describe Dr. Brinkley's operation by the urethral method? A.—You mean the resection operation—that is a very common operation.

Q.—That is a very common operation where they have a very bad condition? A.—It is an operation for the enlargement of the prostate, and that is surgical.

Q.—That is what they call the second operation? A.—That is a surgical operation.

Q.—That is the second operation? A.—I don't know what he calls it, but it is called a surgical operation.

Q.—If the condition is bad, but not absolutely desperate, they try that operation, don't they, that is, the urethral method, isn't that true? A.—That operation is performed for simple enlargements of the prostate without any evidence of a malignancy.

Q.—Then, the only thing they can do, if that can't cure them, is remove the gland entirely? A.—By surgery.

Q.—Remove the gland? A.—Yes, sir.

Q.—And they couldn't very well remove it without surgery? A.—The doctor states he doesn't do any surgery on the prostate, and it occurs to me that that is very radical surgery.

Q.—Do you know of any method by which anybody could remove it without surgery? A.—No, sir, and that is the reason I was surprised to hear it.

Q.—I am asking about the entire removal. A.—That is surgery.

Q.—That is the last and desperate operation? A.—It is not too desperate.

Q.—That is the last operation? A.—It is a difficult operation.

Q.—That formerly was the only method, that is, in any recent years, up until the last decade or so, that was the only operation? A.—Surgical removal was the adopted operation until the development of the transurethral prostate resection.

Q.—That involves the cutting away of a considerable portion of the prostate? A.—Yes, sir.

Q.—I mean of the gland. A.—Yes, sir.

Q.—And that is by a process of going up there with the instruments and cutting it away and taking it out? A.—Just slight portions are removed at times, yes, sir.

Q.—And have you ever performed that operation? A.—No, sir.

Q.—Have you ever performed an operation of the removal of the prostate entirely? A.—No, sir.

Q.—Have you ever performed or attempted to perform this operation, what Doctor calls his technique? A.—He has so many techniques, but if you refer to the injection of the mercurochrome in the vas, I have not.

Q.—He has many? A.—He seems to have many techniques.

Q.—You heard Doctor testify, Dr. Petermeyer and him both, as to the name of the operation that he calls the new technique? A.—Dr. Petermeyer called it—he said it used to be called one thing, and now it is called the surgical technique.

Q.—Have you ever performed that operation? A.—No, sir.

Q.—Have you ever witnessed it? A.—The injection of the mercurochrome in the vas?

Q.—I asked if you ever witnessed that operation? A.—No, sir.

Q.—Are you meaning now to say that all they do is inject mercurochrome, is that the meaning you want to convey to the jury? A.—I merely wish to convey to the jury that I merely understood Dr. Petermeyer to describe several techniques, and among those techniques there was the injection, the cutting of the vas and the injection of mercurochrome, and that seemed to be one.

Q.—Did you learn from Dr. Petermeyer, or gather from him, that that was all he did, just cut the vas? A.—There were many combinations; apparently Dr. Petermeyer was wishing to say they do various combinations of all of these techniques.

Q.—Didn't he tell about the ligation there, and all of that? A.—No physician.

Q.—Answer the question. A.—No. You do not seem to understand the surgical technique.

Q.—Didn't he say he didn't cut but tie? A.—Sometimes they cut and sometimes they tie.

Q.—The ligation is tying? A.—Yes, sir.

Q.—And he told you they don't ordinarily cut but tie them off? A.—I think the evidence shows what he testified.

Q.—Are you trying to convey that you have the impression that he only just opened and put in the mercurochrome, and that is all? A.—Certainly not, and I didn't say that.

Q—Are you trying to minimize or belittle the operation when you speak about the method of injecting mercurochrome? A—I wouldn't minimize any attacks on the human body of that type.

Q—What do you mean by attack on the body? A—Any opening of the human body is referred to sometimes as an attack on the body.

Q—Are you trying to convey the idea that in your opinion that operation is not beneficial? A—In my opinion there is no evidence scientifically collected and established that that operation is beneficial.

Q—And, yet, while the evidence shows that he has operated on many thousands of people for that, you never talked to one of them, is that right? A—The patients?

Q—Yes, sir. A—His patients?

Q—Yes, sir—and you say you never performed it or seen it performed and you never talked to a man that had it performed on him, have you? A—No, sir. May I correct that? One man I did see who had that operation performed on him by another surgeon, and I would like to correct that statement in that manner. He just came to my mind.

Q—How did you know it was the same operation? A—The man described it to me, described to me the operation he had performed upon him by this surgeon.

Q—The man himself described it? A—Yes, sir.

Q—The surgeon didn't? A—No, sir.

Q—Now, Doctor, you say you did publish and offer for sale a family doctor book? A—No, sir.

Q—Telling people how to treat themselves at home? A—No, sir.

Q—Do you have a copy of that book with you? A—No, sir, I don't carry it with me.

Q—Do you have it? A—Yes, sir, but I don't carry it.

Q—What is it? A—"Modern Home Medical Adviser."

Q—And how long ago was it gotten out? A—It was gotten out approximately four years ago, four or five years ago.

Q—That was for home use? A—That was a book of advice.

Q—Was it for home use? A—Yes, sir.

Q—And you don't deny that the book was advertised in the Chicago Tribune do you? A—It is now advertised in many newspapers in the United States.

Q—You don't deny it was advertised in the Chicago Tribune? A—The ads in the Tribune were small.

Q—Do you deny it was advertised in the Chicago Tribune? A—I don't recollect any advertisements in the Chicago Tribune until the last two weeks.

Q—Do you deny it was advertised in the Chicago Tribune? A—Recently.

Q—I have asked you seven or eight times if you deny it was advertised in the Chicago Tribune? A—No, sir.

Q—Don't you know it was? A—Yes, sir.

Q—Don't you know that the complaints piled in from doctors about your advertising the book? A—No, sir.

Q—You don't know that? A—I know there were complaints, but they didn't pile in.

Q—They didn't pile in? A—No, sir.

Q—But the members of your association complained about the advertisements of your book? A—I think a total of six members.

Q—Six members? A—Yes, sir.

Q—How about the other practitioners who weren't members, how about that was there some of them? A—I don't know.

Q—Now, what does it cost a year for a doctor to be a member of the Medical Association? A—Eight dollars in the American Medical Association for Fellowship in the Association, and in each county and state society the dues vary according to the county and the state society.

Q—I asked about the American Medical Association. A—To become a Fellow of the American Medical Association a member pays his \$8 and subscribes for THE JOURNAL, and that is included in the \$8.

Q—There are many sources of income which the American Medical Association has besides the mere matter of the doctors' dues and fees? A—Outside of THE JOURNAL it is all outgo, there is nothing else coming in and it is all expenditure.

Q—You have THE JOURNAL and the Hygeia? A—Everything else loses money except THE JOURNAL.

Q—I didn't ask you that. A—You said income—net income or gross?

Q—I am asking about the income? A—Gross income from subscriptions?

Q—What is the subscription to the Hygeia per year? A—It varies as to whether one subscriber takes it for one year or two years or five years or in groups from \$1.25 a year up to \$3.

Q—What is one person a year? A—One person a year is \$3.

Q—And it carries advertisements all of the time? A—Yes, sir.

Q—Many advertisements of all sorts? A—Not enough.

Q—in other words, it sells space to advertisers? A—Yes, sir.

Q—And in addition to that, you spoke of the 125,000 subscribers, and do you admit there are that many? A—Yes, sir.

Q—And in addition to that it sells on all of the newsstands, practically, of account, doesn't it? A—No, sir.

Q—It doesn't? A—Not on all by far. It sells on approximately a thousand newsstands.

Q—Does it sell on newsstands in all of the large cities? A—On some, probably.

Q—You heard the testimony that it sold at several different places? A—I can tell you how many copies are sold on the newsstands.

Q—You heard the testimony that it was sold and carried in several different places on the newsstands in Del Rio, you heard that? A—Yes, sir.

Q—And would that be true generally of a town the size of Del Rio? A—Yes, sir, all towns of approximately this size, I imagine, at least one newsstand would have the magazine.

Q—And it is sold by news butchers on the train and is always carried by them on the trains? A—No, sir, not that I know of.

Q—You won't say that it isn't? A—I never saw it on the train, and I don't know that our circulation department has made such an arrangement.

Q—Is there any state in the union where it does not sell? A—No, sir; it sells in practically every state.

Q—You said you could tell us how many copies are issued for general sale aside from the subscriptions? A—The newsstands sale would approximate about 2,000 copies or more per month.

Q—And the magazine is subscribed to by most of the doctors, isn't it—by many doctors? A—No, sir.

Q—By many doctors? A—Seventeen thousand.

Q—Seventeen thousand doctors? A—Yes, sir.

Q—Now, those magazines are left in their waiting rooms for their patients to read? A—The doctors complain that the patients take them.

Q—Yes, sir. A—Some innovations, and others very promptly.

Q—Say, for instance when Wise discovered the childhood fever? A—You refer not to Wise but to Semmelweis.

Q—They are put on the table to read? A—Yes, sir.

Q—And, of course, you couldn't estimate—you have no way of estimating how many persons read the one magazine, we will say, just the one copy? A—I wouldn't know.

Q—You would say that generally speaking quite a number of persons read each magazine, would you not? A—I hope so.

Q—You would think so? A—Yes, sir.

Q—Especially where it is left in a doctor's office? A—Yes, sir.

Q—And patients call day by day? A—Yes, sir.

Q—And they are left there many months? A—Yes, sir.

Q—And many people throughout the United States have an opportunity to read that article? A—Yes, sir.

Q—And that paper? A—Yes, sir.

Q—And that magazine? A—Yes, sir.

THE COURT—We will take our mid morning recess, gentlemen.

At this time a recess was taken, after which the following proceedings were had, in the presence of the jury.

Questions by Mr. Morris St.

Q—Doctor, concerning the circulation of the Hygeia, do you not make periodic reports to the authorities as to the amount of circulation? A—Yes, sir.

Q—Do you remember when the last one was made? A—We make a report each year to the House of Delegates.

Q—Do you remember when the last one—I am talking about the governmental authorities? A—No, sir, no report is made on circulation to any governmental authority.

Q—You make no report on circulation to state authorities? A—No, sir.

Q—Not to the federal agencies? A—No, sir.

Q—But you made it to whom? A—The House of Delegates of the American Medical Association.

Q—Do you remember when you made it last? A—One was made last June in San Francisco, and another is about ready to be made now.

Q—Do you remember what the reports showed last June in San Francisco? A—Exactly, how much loss was sustained during the year.

Q—I am not asking that. How many copies of Hygeia were published? A—I believe approximately 125,000 monthly.

Q—Is that as near as you can give it to us? A—Yes, sir. I am not directly in charge of circulation.

Q—But as editor and as having been editor all of the years, you do not know? A—Approximately.

Q—You don't know exactly? A—No, sir.

Q—That was subscribers? A—I don't know exactly.

Q—I say there was that many subscribers? A—No, sir; I believe the number of copies issued, and that would be separated from the subscribers.

Q—You don't know how many number of subscribers—if you don't know, why, say so? A—I don't know exactly.

Q—You said something yesterday about your having heard Dr. Brinkley on the radio offering some pills for a bill or a dollar, or something of that kind, you say you heard that? A—I heard him offer a solution in a broadcast asking people to send him a bill, and not—

Q—I didn't ask you that. A—I am repeating the testimony.

Q—I say, didn't you hear him offer a bottle of pills for a dollar? A—I never said a bottle of pills.

Q—You said in your article, you spoke about a bottle of pills that he sold over the radio? A—The article stated, I believe, the word "pill."

Q—I believe it did. A—Yes, sir.

Q—Your counsel didn't ask you about that. Whom did you get that information from, that he sells pills over the radio? A—I had before me the accumulated material from the Bureau of Investigation.

Q—That is your answer as to why you made that statement? A—I probably made the statement for that reason. I might have had some material of that sort.

Q—I am asking you if that is the best excuse you can give to that statement? A—I don't conceive of it as an excuse.

Q—I am asking you if that is the best excuse for publishing that? A—I don't conceive of it as an excuse.

Q—I didn't ask you that? A—Yes, you did.

THE COURT—The way you frame the question the witness is not going to answer it without an argument.

Q—You have no justification for that save and except you had before you some material of some sort? A—And that I heard him on the radio relative to a solution.

Q—And as to a solution? A—Yes, sir.

Q—And that is all you have on that? A—Yes, sir.

Q—When was it, by the way, that you heard him, claim you heard him on the radio and heard him speak of the solution bottle? A—Some years ago.

Q—How long ago? A—I would say approximately four or five years ago, but I wouldn't be sure exactly.

Q—Where from? A—I believe from the station in Mexico.

Q—The station here? A—In Mexico.

Q—That is the best that you can give us on that, is it? A—Yes, sir.

Q—Doctor, you spoke about these hospitals that are investigated and so forth, and did you not know that the Brinkley Hospital in Milford, Kansas, was for several years a member of the American Hospitals in good standing? A—I did not.

Q—The American Hospital Association? A—I did not.

Q—Do you deny it? A—I can't deny it if I didn't know it.

Q—You just don't know whether that is true or not? A—That is right.

Q—You told us yesterday that what the requirements are for a hospital to be a member, that is to say, they are investigated by investigators, and they are investigated before they become members of the American Hospital Association? A—I didn't make that statement.

Q—What is the statement about the investigation made by the Council on Medical Education and Hospitals by the American Medical Association, it having to do with two lists, a list of acceptable hospitals or registered hospitals and a list of hospitals approved for interns?

Q—But, at any rate, they are investigated before they become members? A—Before they are registered by the American Medical Association.

Q—Doctor, do you know it to be historically true that the medical profession has always been very slow to accept innovations, do you know that? A—Historically true?

Q—Yes, sir. A—Some innovations, and others very promptly.

Q—Say, for instance when Wise discovered the childhood fever? A—You refer not to Wise but to Semmelweis.

REDIRECT EXAMINATION

By Mr. Harrell:

Q.—Yes, sir. There was great opposition against it a long time? A.—The discovery was made simultaneously by Oliver Wendell Holmes in this country, it was suggested by Holmes in this country, and by Semmelweis, and neither submitted proof but merely made the suggestion, and until the proof was established the medical profession delayed the acceptance of the concept.

Q.—Didn't they run him out of the country? A.—Who do you mean by they?

Q.—The medical profession. A.—Of this country?

Q.—Where he was. A.—Where was he?

Q.—If you know? A.—I know the life of Semmelweis, and he wasn't, to use good language, he wasn't forced out of the country in which he was, but he departed.

Q.—He departed? A.—Yes, sir.

Q.—Because of the furor raised among the doctors for what he claimed? A.—Because of his inability to gain acceptance of his concepts.

Q.—Wonder if you know whether Harvey's circulation of the blood, when he discovered it, was accepted very readily? A.—The medical profession of his time, which was approximately 311 years ago, failed to accept his theory until it had been established by him by evidence.

Q.—Until he had established it? A.—The burden is always on the innovator to establish his concepts.

Q.—Don't you know generations went by and condemned him very bitterly? A.—I didn't know that.

Q.—You didn't know that? A.—No, sir.

Q.—What about the vaccinations, were they slow to accept that, or did the medical profession accept it readily? A.—I didn't conceive of vaccination as a theory. When Edward Jenner established vaccination, he first made the statement based on the study of a dairy maid—

Q.—I am asking you was it accepted readily or slowly? A.—You seem to ask for history, and I am giving the history to you.

Q.—I am asking if it was accepted readily.

THE COURT:—If you are going into that line of examination the Doctor is entitled to make his explanation; but I doubt the pertinency; it is, of course, very interesting and it is of interest to me and I am sure the jury, but you can't compress it down into any narrow limits, and if you ask those questions you have to let him answer it in his own words.

MR. MORRIS SR.:—I think the question is apparently in reference to innovations, which the doctor here has, and the question of their acceptance.

THE COURT:—That is a matter of argument. If you want to go into it I will let you, and there is nobody objecting to it, and I won't object to it, but if you ask the questions you will have to let him answer.

Q.—Jenner's vaccination against smallpox was very slow in acceptance? A.—Not for those times, but it would be slow now.

Q.—Pasteur's dog vaccine for hydrophobia, that was slow in acceptance? A.—Not for those times.

Q.—He was very seriously condemned about the fool theory? A.—By some physicians.

Q.—And the tuberculosis bacilli, that was by Koch, wasn't it? A.—Yes, sir, the discovery by Koch of the germ of tuberculosis.

Q.—And they condemned him for a long time for that? A.—No, sir.

Q.—They didn't? A.—No, sir.

Q.—Is it true or not that the medical profession has appeared to be slow to accept and disposed to condemn any new thing or innovation in medicine? A.—Within the last twenty years the medical profession has accepted almost immediately insulin for diabetes, liver extract for pernicious anemia; the prostate operation is accepted by scientific urology. I would say that they accept them nowadays too rapidly; so rapidly, in fact, that the government has passed a law, and asked them not to be too rapid, and has tests for the drugs before they are accepted, and that applies to therapeutic devices and foods.

Q.—Have you noticed throughout the history of the medical profession that they were rather slow and critical of innovations? A.—They never accept without evidence.

Q.—And they have bitterly condemned for some generations many—or for many years, many innovations that proved to be of great benefit to mankind? A.—I can't answer the question without the definition of the word "they."

Q.—The medical profession, many members of the medical profession, the body of the medical profession, the body of the members of the medical profession? A.—I would say in general the statement is not fair.

Q.—You would say that as to those various things I asked you about? A.—You haven't been quite fair.

Q.—I haven't been fair, is that it? A.—Yes, sir.

Q.—And wherein, then, have I not been fair in asking you the questions? A.—The nature of the question was such as to attempt to throw disrepute upon the medical profession for their delay in accepting new announcements of discoveries until the investigator or introducer of the discovery had established by scientific evidence the real worth of his proposed innovation or technic.

Q.—That is your argument on that matter, is it? A.—That is no argument, it is a simple statement of truth.

Q.—Do you deny now that Dr. Brinkley is licensed today in at least four states to practice medicine? A.—To my knowledge he is licensed at present in Texas and Arkansas, and his license was revoked in Connecticut.

Q.—I didn't ask you anything about that, whether his license was revoked.

MR. MORRIS SR.:—This witness, I think, has mentioned that perhaps fifty times in his testimony here, but wholly without being asked about that, and I will ask the Court to instruct the witness to answer my question.

THE COURT:—I think there is evidence in regard to the matter. The way you frame your questions, Counsel, invites an argument; instead of asking a question you say "Do you deny that," and that is a signal of combat immediately; you ask for an argument in the way you frame the question.

Q.—I will ask you, yes or no, if you deny that today he is licensed in Tennessee?

THE COURT:—You can't require him to answer yes or no every time.

Q.—Do you deny he is today licensed to practice medicine in the state of Tennessee? A.—I don't know about Tennessee.

Q.—Do you know whether he is licensed in the state of Missouri today? A.—I don't know.

Q.—So, you can't deny that Dr. Brinkley today has licenses to practice medicine in as many as four states of the union? A.—I know he is licensed in Arkansas and Texas, and I do not know of any other licenses.

Q.—Do you know whether he was ever licensed in Tennessee? A.—I don't know.

Q.—Do you know whether he was ever licensed in Missouri? A.—I could not tell you without verifying it, but I can verify it.

Q.—Now, Doctor, regarding meeting Dr. Brinkley on the *Normandie* on this return trip from Europe in 1937, will you tell us what reason, if any, you had, that is, when you saw Dr. Brinkley, for not pursuing him and making his acquaintance? A.—In the first place, I had never been introduced to Dr. Brinkley by any one in whom I would have confidence; and, frankly, because of my position I am constantly sought by many people and I must find out the nature and character of the people before I make their acquaintance, and, in the second place, having recognized Dr. Brinkley from his pictures, primarily, I remembered that at various times Dr. Brinkley had brought suit against me and against the American Medical Association and against various other publications for various amounts of money, and I didn't conceive that it would be the proper part for me to perform in order to seek out the acquaintance of any one who had at various times brought suit against me and against the American Medical Association and various publications for damages and for other reasons.

Q.—Now, Doctor, regarding your medical practice and study, will you tell us—I don't believe it was brought out—if you attended any clinics during the period of time since you graduated from medical school? A.—My position is such that I am constantly visiting all the important clinics and hospitals of the United States in order to obtain at first hand information concerning any discoveries which seem to be of importance and well established in the field of medicine; I visit the Mayo Clinic at least once each year, making rounds with Dr. Will Mayo and seeing patients and operations; within the past three weeks I visited the New York Hospital, where I saw Dr. Du Bois and Dr. Cattell in an investigation having to do with the detection of pain associated with surgical procedures; I have visited within the past year, and every year, at least four or five leading hospitals and institutions of research such as the Rockefeller Institute, the Nelson Morris Institute, recently the Cincinnati General Hospital where I learned at first hand about the use of nicotinic acid in pellagra, and sulapyridine in the treatment of pneumonia; I have frequently seen operations on prostate glands performed by surgeons of repute who were members of the American Urological Association.

Q.—Doctor, there is some mention made here of a certain book this morning, "Medical Mussolini," and do you know anything about this book? A.—Well, I have characterized the book as a scandalous work, and the author has published it and circulated it; I may say in advance that I never answer any personal attacks made upon me; I believe my record stands for itself.

Q.—The author of this book is the same Morris A. Bealle who was formerly the editor of a certain magazine entitled *Plain Talk* magazine, is that right? A.—Yes, sir.

Q.—Doctor, will you tell us if Dr. Brinkley, to your knowledge, has ever submitted his technic for his operation for reduction of the prostate to recognized medical journals of the United States? A.—Not to my knowledge; I could say it has not been printed in any recognized medical journal.

Q.—Now, there is mention made here, Doctor, of a certain book of which you were the author, "Modern Home Medical Adviser," and will you tell us the circumstances under which that book was published and any explanation you have regarding the publicity. A.—The publishers asked me to prepare for them a book of advice to the public as to the nature of most diseases and the best methods of preventing such diseases and asked me also to discuss such things as the average family could use in a family chest without any danger of harm to them; not wishing to take the entire responsibility on myself, I asked twenty-six of the leading specialists in the United States, including Dr. Joslin, the leading authority on diabetes, and Dr. Russell Wilder, specialist on vitamins and diet, and including many others, to write articles describing the various diseases of the human body and the best methods of preventing them, and that was prepared by having the men write an article in a scientific manner; and since many weren't capable of writing so that the public could understand, and since it is a part of my accomplishment to rewrite material in a form that the public understands easily, these articles were edited and rewritten and sent to the men for their approval and then published in the book, and then the book was offered for sale in the ordinary book stores. I may say that I write the books and do not sell them and do not advertise them; in ordinary publication one submits a book, after it is written, to the publisher, and the publisher then publishes it and promotes the book. The book has been sold in various ways, and it has been used as a premium with such leading newspapers as the *New York Post* and the *Chicago Times* and the *Philadelphia Record*, and has also been used as a premium by *Colliers' Weekly*; the book has a recognized status in the field of public health education.

Q.—Now, when you said in this article, Doctor, in substance or in exact words, "You send your dollar and you get your pill" with reference to Dr. Brinkley selling this medicine over the radio, or answering these letters, what did you mean by that? A.—I may say that in writing an author—

MR. MORRIS JR.:—We desire to object to that; the language is plain and not ambiguous, and it is not a subject of his testimony as to what he intended by it.

THE COURT:—I think it would be admissible. I will overrule the objection.

MR. MORRIS JR.:—Note our exception.

Q.—There are certain terms in all languages known as idioms, like "you pay your money and you take your choice," and this is "you send your dollar and you get your pill," and the word "pill" is used as "remedy"; and that might be used and applied to any sort of figurative language used in that way; and when I testified I stated specifically that I had in mind the solution offered over the radio with the statement that the patient need not describe the symptoms, merely put the name on a piece of paper and send it with a bill, after which the remedy would be sent.

RE-CROSS EXAMINATION

By Mr. Morris Jr.:

Q.—About your book, did you mean to convey the idea that you weren't responsible for it being advertised, that it was left to the publisher, and you mean to say you didn't get anything out of the sales? A.—I derive income from writing; that is my profession.

Q.—From that book? A.—Yes, sir.

Q.—You didn't mean to convey that you didn't get any benefit out of it being advertised? A.—I don't pay for the advertising or the promoting.

Q.—And you got an income for your writing? A.—Yes, sir.

Court then recessed.

TESTIMONY OF A. I. FOLSON

Dr. A. I. Folsom testified that he is a physician, residing in Dallas, Texas, practicing thirty-one years, specializing in urology, a member of various medical societies and of the American Board of Urology. The evidence then proceeded:

Q—Do you know who Dr. Brinkley is, Dr. John R. Brinkley? A—I know him by reputation only.

Q—Is he a member of any of those boards or associations which you have mentioned? A—Not that I know of. I think he is not.

Q—Do you know whether or not in the past Dr. Brinkley has advertised himself as a goat gland specialist? A—He has.

Q—Now, Doctor, I will ask you if in your opinion it is physically possible to transplant the testis of a three weeks old goat into the testis of a human and have that goat gland live. I—It is not.

Mr. Morris Sr.—Just a moment. We object to that, may it please the court. The testimony definitely shows the fact that the doctor has not even performed that operation since 1932 or 1933, and that his work has been in the prostate work, prostate gland, ever since that time, and was when this article was written. The article itself takes notice of the fact that it wasn't any longer his practice, and the defendant has testified that he understood that and knew that long before he wrote this article, and therefore that is just building up a straw man to try to knock down. That has nothing to do with the case. We admit of course the fact that the article mentioned the past practice, but we think it has no probative force here and that it would be irrelevant and immaterial and incompetent to establish any issue or defense in this case, and I have stated about the time, it is too remote and shows a practice that—that the doctor himself, the plaintiff, explained how long and why it had been discontinued and we would say too that no predicate has been laid and this witness is not shown to be qualified on that question. Unless he has shown himself to be qualified on that matter it would be speculative on his part.

The Court—I think that the sweep of this article that is declared on here is broad enough to put into issue Dr. Brinkley's entire professional activities, and I don't think that it could be fairly limited to just what he has been doing in the last few years, so I will overrule your objection on that ground. Now, with regard to the qualification of the witness I think his testimony as to his training and experience is amply sufficient to warrant the court admitting his evidence. The weight to be given to it, of course, is to be determined by the jury. Overrule the objection.

Mr. Morris Sr.—Note the exception.

Q—Will you answer the question, Doctor, or did you? A—I think I did.

The Court—He answered it could not be done.

Q—Now, Doctor, in connection with your practice in the field of urology, have you ever dissected and examined and made a study of human testicles? A—I have.

Q—Have you—well, upon how many such occasions? A—That would be difficult to estimate. I taught anatomy for three years and dissected anywhere from twenty to forty bodies every year, and in addition to that during thirty years or more I have been practicing medicine I have operated on many of them. It would be rather difficult for me to say just how many.

Q—Have you kept up with any literature on the subject regarding the nature and construction of the human testicle? A—I have.

Q—Now, Doctor, as a result of that will you please explain to the jury why, in your opinion, the goat gland cannot live after transplantation into the human? A—The principal reason is because of the fact that the blood supply of the piece of tissue that is transplanted—in other words, the vessels from the patient into whom the piece of tissue is transplanted—does not have a chance or time to form blood vessels into this piece of tissue. The testicular tissue is a rather delicate tissue, and for that reason it dies before the blood vessels can make their way into the piece of tissue.

Q—What would you say as to the fact that when a pocket is prepared into which the goat gland is inserted, that human blood rushes forth and could then be absorbed into the goat gland, causing it to have a blood supply? A—The blood itself which would rush into there as a result of the pocket being prepared is purely a temporary thing, that is simply the hemorrhage incident to the operation. The blood supply upon which the piece of testis would have to depend for its living would have to be as a result of the slow, gradual growth of small blood vessels from the testicle into the piece of tissue.

Q—Would that rushing forth of the human blood provide a temporary blood supply that would sustain life of the goat gland? A—No, it would not. The more blood that rushed in there at the time of the operation would rather hinder the thing rather than help it because it would tend to kill it quicker than it would otherwise.

Q—Now, Doctor, in your opinion is it possible ever successfully to transplant glands from one animal to another? A—It has not been found successful, no, sir.

Q—Do you know that it has been found unsuccessful? A—It has been found unsuccessful. It has been done experimentally many different times, and it has never been found successful.

Q—Now, Doctor, for the benefit of all of us here concerned with this, will you explain just briefly and in language that we can understand the construction and operation, in general, of the male genital system? A—Well, the principal—you want principally the testis and prostate?

Q—Beginning with where the sperm is produced to when it leaves the body. A—The sperm is produced by the testis or testicle, which is a gland made up of a large number of secreting tubules, little small tubes that are wound in and around each other and in a mass and are held together by a membrane bone outside, which gives the testis its form, and then at the upper end of the testicle these tubules are collected together in a few small tubules, and they pass from the testicle out into a structure known as the epididymis. Then there comes off a little duct known as the vas deferens or a little tube known as the vas deferens, and it is through this tube that the sperms which are manufactured in the testicle are carried, through this little tubule in the epididymis, and they are finally carried up this little duct through the groin and into the abdomen, and at the base of the bladder this duct expands, gets a little larger, and then there is a little by-pass off into a place known as the seminal vesicles. That is a little hollow structure about the size of a little glove finger that is irregularly arranged, and the sperms are stored in this seminal vesicle. Then coming off from the seminal vesicles is a much smaller tube known as the duct, and that opens into the floor of the prostate gland, and that is where the semen, which is manufactured in the testicle and transported through the vas deferens and up into the seminal vesicles, is finally delivered into the channel of the urethra. The prostate gland itself is a gland structure which is about the size of an average sized English walnut. It is made up of five groups of glands or groups of tubules or lobes, the principal ones are the two lateral ones and the middle one,

and some textbooks in describing them only describe three, but in some textbooks they are described as five, an anterior and posterior, and this structure, the prostate gland, is a little structure very much like a sponge. It has a large number of little cavities in it and the secretion of the prostate is manufactured in the prostate gland.

Q—Now, will you tell us just where the prostate gland is located in the body with reference to the seminal vesicles? A—The prostate gland lies just in front of the seminal vesicles and it surrounds the beginning of the urethra and at the base of the bladder, and it lies just in front of the rectum.

Q—Tell us what the urethra is. A—A channel through which the urine runs after it leaves the bladder.

Q—And it is that same channel through which the sperm leaves the body? A—It is.

Q—The sperm never passed from the seminal vesicles into the prostate direct? A—No, sir.

Q—Well, what is the function of the prostate gland, then? A—The prostate gland is largely the sexual center. It is a very richly supplied gland with nerve endings and it has one of the principal roles in the sexual function. In addition to that the secretion of the prostate gland has the power. When it comes in contact with the sperms, the sperms are little cells very much like a wiggletail they are quiet, they have no motion as long as they are in the testis or in the seminal vesicle or in the vas, but in sexual intercourse the secretion from the prostate mixes with the sperms from the seminal vesicles and the secretion of the prostate has the power to activate or motivate or make them so they move around. They become very active, and that is one of the functions of the prostate gland.

Q—Now, Doctor, I will ask you what if anything, is the actual effect on a human of transplanting this goat gland in the manner that has been described? A—I don't think it would have any effect at all.

Q—Well, by that you mean it would have no functional effect? A—No.

Q—What would happen to it? A—I think it would die.

Q—What happens when it dies? A—It either is sloughed out immediately, or rather soon after the operation, or if it doesn't do that then it becomes filled with scar tissue, fibrous tissue, and simply becomes a cyst in the testis.

Q—When it becomes a scar, would that be a hard substance or soft, or what? A—Scar tissue is always more or less firm or hard.

Q—In other words, it would just leave a little lump there? A—That is right.

Q—Now, this transplanting of the goat gland, whether accompanied by any other surgical or medical technique or not, would the mere transplanting of that goat gland have any effect, in your opinion, upon an enlarged prostate? A—Not a particle.

Q—Would it have any effect whatsoever upon reducing high blood pressure? A—None at all.

Q—Would it have any effect on treatment, or in treating hardening of the arteries? A—It would not.

Q—Would it have any effect in creating energy in a man? A—No. I don't think so.

Q—Or in curing epilepsy? A—No.

Q—Locomotor ataxia? A—No, sir.

Q—Neurasthenia? A—No, sir.

Q—The intensity of the type known as dementia praecox? A—No.

Q—Diseases of the stomach? A—No.

Q—Bowels or kidneys? A—No, sir.

Q—Well, would it have any effect in relieving constipation? A—None at all.

Q—Would it have any effect in curing sterility caused by mumps? A—None at all.

Q—As a matter of fact, Doctor, can sterility caused by mumps be cured in any manner? A—No.

Q—Why is that? A—Because of the fact in mumps the involvement of the testis or testicle is what it is, it is an involvement of the testicle itself. It is an inflammatory process that results in the destruction of the testis and it is never regenerated.

Q—Now, Doctor, how many types do you urologists recognize of prostatic trouble? How do you classify prostatic disorders? A—Well, the infections.

Q—What do you call that? A—Is one.

Q—What is that? A—That is prostatitis. Enlargement of the prostate, we speak of it medically as hyperplasia or enlargement, as it becomes grossly overgrown and obstructs into the channel through which the urine passes, and in about 20 per cent of the cases of enlargement of the prostate the change is a cancerous change. In other words, carcinoma occurs in about one out of five.

Q—Doctor, you speak of the large prostate closing the channel through which the urine passes. How does that happen, just what does it do? A—What does the prostate do?

Q—Yes, to close that channel? A—Well, the prostate surrounds the neck of the bladder or beginning of the channel, the beginning of the urethra, and just like a horse collar does a horse's neck, and if you can imagine that you suddenly enlarge the horse collar four or five times you can see the pressure on the horse's neck, it might choke him, and that is the same thing happens in the urethra, the urethra simply becomes choked off so the urine has difficulty in getting through.

Q—Now, Doctor, with regard to these little ducts, little tubes you call them, the efferent ducts between the testicle and the epididymis, they lie right on it, say like a finger, as you say? A—Yes, sir.

Q—How large are those little ducts? A—They are very small.

Q—Well, can you give us any more definite idea? A—Well, they are almost microscopic in size. You can't see them hardly at all. You can feel them, that is, the individual ones.

Q—And assume that there are somewhere between twelve and twenty of those, in how confined a space are they located? A—In a manner I should say about a quarter of an inch square.

Q—Now, Doctor, what does palpate mean? A—Feel.

Q—Is it possible for you to draw the testicle out of the enclosure that it is in the scrotum to then feel those little ducts between the testicle and the epididymis? A—No, sir.

Q—Is it possible, in your opinion, to select out any one of those little ducts and tie it off with a piece of linen thread? A—It could not be done.

Q—Now, Doctor, I will ask you, assume that it could be done and assume that a man was stated to have prostatic enlargement who was treated in the following manner that a part or all of these little tubes, say half of them, were tied off with linen thread, and that a portion of this other tube leading from there, the larger tube you have described as the vas deferens, may or may not have been taken out and cut away, and assume that the vas deferens is injected with a 2 per cent mercuric bichloride.

solution, and assume that after that operative treatment there is a follow-up postoperative treatment during which approximately six ampules containing 20 cc. of a solution composed of one thousand parts of water to one part of hydrochloric acid and a small amount of blue coloring matter were injected into a man's veins, that covering a period of several days, have you an opinion as to whether or not that procedure might or could in any way affect prostatic enlargement? A.—I do have an opinion.

Q.—What is your opinion? A.—I don't think it could.

Q.—Will you tell us why? A.—Well, that is a pretty big order to tell you why. In the first place, the prostatic hypertrophy does not depend in any way on any change in the testicle itself or in the vas deferens. It is an intrinsic thing, that is, a thing that is inherent in the prostate itself, and I don't think anything that would be done to the testicle or vas would in any way affect the size of the prostate, and I do not think that the solution which you have described could by any remote stretch of your imagination have any effect on it whatever.

Q.—All right. Now, Doctor, have you an opinion—or what would be your opinion as to whether that procedure we have described, we will call it a surgical technic, could have any difference at all, or have any effect at all upon blood pressure? A.—None at all, I think.

Q.—Any effect at all upon hardening of the arteries? A.—None at all.

Q.—Or upon sexual rejuvenation; improving sexual power? A.—None at all.

Q.—Have you ever seen a patient on whom part or all of this procedure had been done? A.—Yes, sir.

Q.—And what part of the procedure was done, or was it all done? A.—I have seen some patients in whom I was told that they had the compound operation. Now, if that is what—if the questions you have asked me constituted the compound operation, then that is what they have had.

Q.—Well, have you ever seen a patient actually have any part of this operation done? A.—Yes. You mean see them have it done?

Q.—Yes. A.—No.

Q.—Not even part of it? A.—No.

Q.—Did you see those patients before the technic was done? A.—I saw some of them before, yes.

Q.—Then did you examine them after it was done? A.—I did.

Mr. Morris Jr.:—We are going to make an objection to anything along this line, because there is no proof at all that they had received the operation from Dr. Brinkley.

Mr. Reynolds:—I withdraw the line of questioning.

The Court:—He withdraws the question.

Mr. Morris Jr.:—We ask all questions with reference to that matter and what questions have gone in be excluded. I don't think he has given any testimony. He said he saw some; he hasn't given any testimony about it.

Q.—All right. Now, Doctor, will you tell us what is the meaning of the word isotonic? A.—Isotonic is a chemical term used to represent a solution which is as nearly as possible the same specific gravity and the same structure as the blood stream.

Q.—Now, Doctor, this solution that I have described to you before, a thousand parts of distilled water to one part of hydrochloric acid, with a little blue coloring in it, is that what is known as an isotonic solution? A.—No.

Q.—What is it known as? A.—I don't know just what you would call it.

Q.—Is it hypo? A.—What?

Q.—Is it hypo? A.—It is hypotonic.

Q.—What does that mean? A.—Below the specific gravity of blood.

Q.—In every day language does that mean weaker? A.—Yes, sir.

Q.—Now, then, Doctor, in your opinion what would be the effect of injecting that kind of solution into a man's veins? A.—I don't think it would have any effect if it was carefully injected and sterile.

Q.—Would it have any functional effect at all? A.—I don't think so.

Q.—Would it have any more effect than distilled water itself? A.—I doubt it; I doubt if it would at all.

Q.—Well, is there any reservation on that? A.—I don't think it would.

Q.—If there is we want to know. A.—No, I don't think it would.

Q.—Is there any point in injecting distilled water into the blood stream or into the veins? A.—Not that I know of.

Q.—Is there any point in injecting large amounts of distilled water?

A.—Well, in surgical practice we frequently inject large quantities, large quantities of that, of an isotonic solution of salt or a glucose solution, that is a recognized.

Q.—I was asking, Doctor, about the distilled water. A.—Oh, no; distilled water is considered a bad thing to inject by itself into the blood stream, for the reason that because of the fact that it is a weaker solution it tends to absorb out of the blood cells certain substances which are necessary for their proper functioning, and therefore the distilled water is considered not only not a beneficial but an actively harmful thing.

Q.—Well, now, Doctor, in connection with your general knowledge, not especially confined to the field of urology, you understand the affliction commonly known as rickets, do you? A.—I do.

Q.—What would you say as to advice to a patient that thyroid extract be used for rickets? A.—For rickets?

Q.—Yes. A.—There would be no basis for that.

Q.—Well, would there be any good or bad effect, or just purposeless, or what? A.—Well, it might be purposeless. On the other hand it might be quite harmful if the patient to whom the thyroid was given was receiving a sufficient supply of thyroid substance from his own gland, then the administration of an excess or an additional amount of thyroid might be definitely harmful.

Q.—Would, in your opinion, would it be good advice to advise a patient to do that without the control and administration of that substance by a physician? A.—Thyroid should never be given without a preliminary estimation of the basal metabolism rate, that is, the rate to determine how rapidly the varying functions are going on in the body, which is a qualitative—I mean quantitative—estimate of the amount of thyroid going into the blood stream. If that is low it is given, and if it is not low no thyroid should be given. No thyroid should be given before having that test.

Q.—Would you say a qualified and reputable physician would advise a person to take thyroid extract without designating how, when or where, after merely having been told that a person has rickets, without performing the tests? A.—I don't quite get your question.

Q.—Would you say that it is the general custom and practice among qualified and reputable members of the medical profession, after merely having been told by a patient whom he had never seen, that the patient had rickets, that he would then advise the use of some thyroid extract, without indicating how, when, what or under what conditions? A.—No, not at all.

Q.—Doctor, do you know Dr. Brinkley's general reputation in the medical profession? A.—I do.

Q.—What is that reputation?

Mr. Morris Jr.:—Now, just a moment. We object to that as not being competent to establish any issue in the case, being improper, irrelevant, immaterial, and not the proper predicate, and not confined to the question; the reputation of any man is the general reputation in the community where he resides and his reputation not among any given body of men or anything of that sort, and we object for the reasons stated.

The Court:—Overrule the objection.

Mr. Morris Jr.:—Note the exception.

Q.—What is his general reputation among medical men? A.—He has a reputation of being a quack.

Q.—What do you mean by that? A.—We mean by that a man who practices medicine without regard to the standards, traditional ethical practices and customs of the profession.

Q.—Now, would you say that means merely because he advertises, is that it? A.—That is one of the things.

Q.—Is that the only one? A.—No.

Q.—What else? A.—Because of the fact we think—

Mr. Morris Jr.:—Just a minute. We object to the testimony because it would call for a conclusion and opinion of the witness, and is not a proper subject of inquiry, not a matter of general reputation.

The Court:—This is a case where the man puts his reputation in issue here and says it has been damaged. They have a right to inquire into what his reputation is. Not only inquire as to what it is among doctors, but you can inquire as to what it is among people generally. Overrule the objection.

Q.—Will you answer the question?

Mr. Morris Jr.:—It isn't a question of his reputation—

The Court:—I heard you once on it, counsel. If you want to change the time to what is his reputation in 1938, when the article was published, then I would sustain it to that extent.

Mr. Morris Jr.:—Note the exception.

Q.—Well, confine the question to prior to February 1938.

The Court:—All right.

Q.—Was the advertising that he does the only feature that entered into your statement?

The Court:—Let's get that date straightened out as to the reputation before the publication of the article.

Q.—Was he considered by—strike that. Was his general reputation among medical men prior to February 1939 that of a quack? A.—It was.

Mr. Morris Jr.:—Just a moment. We object to that as not being confined to the proper time nor the proper place.

The Court:—Overrule the objection.

Mr. Morris Jr.:—And it calls for a question which is not properly—

The Court:—All right. I overrule the objection.

Mr. Morris Jr.:—Note the exception.

Q.—Answer the question. A.—It was that.

Q.—I will ask you that same question and say in February 1938? A.—It was.

Q.—Now, Doctor, will you state what we were trying to get at there, whether or not the advertising is the only thing that entered into that, if you know? A.—No, it was not. It was the fact that he was advertising to do a procedure for the relief of a certain condition which everybody who knew anything about the prostatic enlargement knew could have no effect whatever on the condition.

Mr. Morris Jr.:—Now, we move that that statement be excluded as stating a matter of medical opinion as a matter of his knowledge, and that the question is a conclusion and an improper one and one that he is not qualified to draw and one of course that could only be expressed as a mere matter of opinion.

The Court:—Overrule the objection.

Q.—Now, doctor, if I had asked you the same questions regarding his reputation among genital-urinalogists, we will say, would your answer be any different? A.—No.

Mr. Morris Jr.:—Just a moment. We make the same objection to that. It is not general reputation. For instance, if the court please, there are many authorities which hold that you may not inquire as to what his reputation is among a part of the community, but it is his general reputation and not his reputation among any particular set and we object for the reasons stated.

The Court:—Overrule the objection.

Mr. Morris Jr.:—Note the exception.

Q.—Doctor, I will ask you whether or not Dr. Brinkley, either generally in the medical profession or among urologists, had the reputation of being a specialist in prostate treatments? A.—He did not.

Q.—I will ask you whether or not—

Mr. Morris Sr.:—Of course, we make the same objection to all this, your honor.

Mr. Morris Jr.:—Is it understood our objection goes to all this in these various forms of questions?

The Court:—I don't know, counsel.

Mr. Morris Jr.:—Well, we do object to the question that has been stated.

The Court:—Overrule the objection.

Mr. Morris Jr.:—Note the exception.

Q.—Do you know whether or not Dr. Brinkley had any standing in the circles made up of urologists? A.—He did not.

Mr. Morris Jr.:—Now, just a moment. Don't answer the question, please, sir, until we have an opportunity to object; and we object to that as not any proper—not founded on his general reputation, that the proper predicate has not been laid as to whether he knows his general reputation, and it is merely a conclusion and opinion of the witness.

The Court:—Well, counsel, it is necessarily pertinent evidence what doctors generally think of other doctors, if they were in a position to find out about it and know. It would be pertinent to find out what a lawyer was generally thought of by other lawyers or judges, or how architects were regarded by other architects. They are people who are in a better position to know about them than anybody else, and one of the component elements of Dr. Brinkley's damages, if he has been damaged here, would be the lowering of his standing in the opinion of his fellow doctors. If it happens he had no standing in the opinion of his fellow doctors, it follows naturally he hasn't been damaged. So I think the evidence is pertinent and admissible.

Mr. Morris Sr.:—I want to call attention to the fact that no such allegation as that is made in the petition itself. It is the standing generally.

The Court:—Doctors are part of the general public. Doctors refer work to one another, and it is a very valuable asset to a doctor to stand well with other doctors, so I think that is one of the elements that can be considered. I would let him inquire as to his standing with the public generally and I don't think the public generally is in as good a

position to pass on his qualifications as a doctor, but after all it is a question whether his reputation has been injured generally. Overrule the objection.

Mr. Morris Jr.—Note the exception.

Q—Doctor, do you know whether or not Dr. Brinkley had any standing—and the time is February 1938 or prior thereto—as a genital urinary surgeon?

Mr. Morris Jr.—Is it understood those objections go to that?

The Court—Yes.

The Witness—Shall I answer?

The Court—Go ahead, Doctor, answer the question. *A*—He did not. *Q*—I ask you, Doctor, whether or not either in the medical profession generally or in the circles of urologists and genital urinary surgeons, Dr. Brinkley on that date or before or after at any time had or has the reputation as being the greatest prostatic specialist in the world?

Mr. Morris Jr.—Now, just a moment. We object to that as not being confined to the proper time. The question is duplicitous, asks with reference to several groups, asks with reference to several different times, and it is not confined to the place of residence, and not a competent manner to prove reputation by a question of his standing but it calls for a conclusion and opinion of the witness, and is irrelevant and immaterial, and no predicate has been laid as to his knowledge.

The Court—I think there is some claim made in that book that he published and gave away that he is the greatest prostate surgeon in the world, is that what it is?

Mr. Reynolds—Your honor the reason I asked it at the present time, the evidence yesterday showed night before last he broadcast over the radio a contest for people to write in—it was right here on the stand—they were to write a contest on that phase.

The Court—Overrule the objection.

Mr. Morris Jr.—Note the exception.

Q—Do you remember the question, Doctor? *A*—He did not.

The cross examination followed.

CROSS EXAMINATION

Questions by *Mr. Morris Jr.*

Q—Doctor, you say you are a member of the American Medical Association? *A*—I am.

Q—For how long? *A*—Oh, I have been a member since 1909.

Q—Did you know when Dr. Brinkley was a member of the American Medical Association or for how long? *A*—No.

Mr. Reynolds—I object to the form of that question. They are assuming he has been a member. There is no proof of that.

The Court—Dr. Brinkley testified he had been a member and was put out when he started to advertising.

Mr. Reynolds—We withdraw the objection.

Q—Did you know him when he was a member of the American Medical Association? *A*—I did not.

Q—Did you know if he had been? *A*—I did not.

Q—Or for how long? *A*—I did not.

Q—You didn't know that? *A*—No, sir.

Q—In other words, Doctor, the profession, the American Medical Association, those members of the profession who are members of that association decried advertising, don't they? *A*—Well, every reputable—

Q—I am just asking you that question. Answer yes or no. *A*—No.

Q—They don't decried? *A*—I misunderstood your question.

Q—I say they decried advertising by a doctor? *A*—Yes, sir.

Q—And you don't know whether it was by reason of Doctor's advertising that he either withdrew or was expelled by the American Medical Association or not, you don't know anything about that, do you? *A*—No, sir.

Q—Now, Doctor, personally have you performed this operation, the technique of which you spoke about? *A*—I have not.

Q—You have never performed it? *A*—No, sir.

Q—Have you ever been present at the performance of that operation? *A*—No, sir.

Q—You have not? *A*—(No answer).

Q—You have no experience in that operation? *A*—Not in the operation that he described.

Q—Yes, sir. That is either of their operations, I mean, the last operation he spoke of, nor of the human—or the human or animal gland operation? You never had any experience with either of those, did you? *A*—I have done some experimental work in the transplantation of glands.

Q—Was that human or animal glands? *A*—With dogs.

Q—Animal? *A*—Yes, sir.

Q—You were never present and saw Dr. Brinkley's operation, of either sort, were you? *A*—No, sir.

Q—You have never seen nor known personally, had any personal contact or observation of the operation he has performed now for the past number of years on patients? *A*—I have never seen him or his assistants do this operation, no, sir.

Q—The prostate gland operation which I would call a minor operation, in other words, not the urethral but the one where counsel have attempted to describe to you the ligating of the tubes and so forth, you never—you have never seen that operation performed by anybody? *A*—No, not for this thing, no.

Q—Now, Doctor, there are several stages of the enlargement of the prostate gland, are there not? *A*—Oh, yes.

Q—You speak of it in three stages? *A*—Three or four. It is variously estimated at three or four.

Q—That generally happens at what age in men? *A*—It generally begins to happen in the fifties and gradually increases in the sixties and seventies, maybe.

Q—Sometimes it happens earlier? *A*—Sometimes it happens earlier, yes, sir.

Q—Now, that enlargement, when it gets to what you call the third stage, is likely to entirely cut off the flow of the urine? *A*—The size of the gland apparently doesn't have anything to do with the actual obstruction. Sometimes small glands cause much more obstruction.

Q—Depending on what gland grows? *A*—No, sir.

Q—It has to choke the neck of the bladder, doesn't it? *A*—It has to produce some result which we do not actually and entirely know about.

Q—This gland ordinarily and normally in a human being is about how long? *A*—About the size of an English walnut.

Q—An English walnut may be large or small? *A*—It is about 5 cm across and about 4 cm deep and about 3 cm thick.

Q—Give it to us in inches. *A*—An inch and a quarter or an inch and a half across.

Q—I asked you that— *A*—About that.

Q—That is the question I asked you first. *A*—Now, the enlargement, as it becomes diseased or disordered, it becomes larger until it comes times gets to what size, maximum? *A*—Oh, I have seen them some times where they are larger than a big grapefruit.

Q—Well, would you say four inches? *A*—Four or five or six inches. I have seen them that much across.

Q—When they get enlarged and diseased that way what is the effect upon the urinary power? *A*—The first effect is obstruction to the passage of the urine from the bladder.

Q—What effect does that have in reference to pain and bother, trouble with the patient? *A*—Sometimes it doesn't give them any discomfort or pain at all.

Q—Well, as it progresses and gets bad or diseased what are the symptoms of pain they suffer, if you know? *A*—The symptoms of pain?

Q—Yes. *A*—I don't know what you mean by that. Pain is a symptom.

Q—What are the symptoms that are expressed that cause pain what are the symptoms of the trouble or disease that causes the pain? *A*—Pain is a symptom. Your question, I don't know how to answer it.

Q—What causes the pain, can you understand that? *A*—Yes, sir.

Q—Tell us then. *A*—Because they can't pass their water.

Q—Is that the only reason? *A*—The principal reason, yes, sir.

Q—Is it the mere cutting off of the water, is that the only cause of the pain? *A*—That is the principal reason.

Q—Well, what others are there? *A*—Infections sometimes, sometimes stones form behind the prostate, sometimes cancer, and there is metastasis that is the cancer going outside the prostate and into the bone of the spine. That produces pain. There are many causes of pain in the prostate.

Q—Now, ordinarily one of the operations is the urethral operation, isn't it, the transurethral? *A*—That is one. That is the most recent advance.

Q—By that you mean that is just a reaming process up there, you mean out that gland isn't that right? *A*—You go in and actually do a removal of all of the gland.

Q—The whole gland? *A*—Yes, sir.

Q—Well, you mean in the transurethral? *A*—Yes, sir.

Q—You don't ream it out and remove part of it? *A*—We remove all of it, practically all.

Q—Is it commonly done and called the reaming out process? *A*—I guess that is what you mean by the prostatic resection.

Q—And now do you mean that in every instance of the reaming out process they remove the entire gland? *A*—We try to.

Q—You try to? *A*—Yes, sir.

Q—Well, would you say you did? *A*—Well, we practically succeed.

Q—What is the other method? *A*—The two older methods of removing the prostate gland one was what was known as the suprapubic where the incision is made in the lower part of the abdomen and the bladder is opened and the gland removed through the abdominal wall. The other is one in which an incision is made just in front of the rectum, a section is made through to the prostate and the prostate is removed through that direction.

Q—Well, both of those contemplate the removal completely of the gland? *A*—Of the gland, yes, sir.

Q—Those both contemplate the complete removal of the gland? *A*—In neither one is there ever a complete removal of the gland. There is a portion of compressed gland tissue that is always left no matter whether you use the suprapubic or the perineal, where the incision is made just in front of the rectum.

Q—It is what you commonly call the removal of the gland? *A*—Yes.

Q—What are the effects that are likely to flow, what are found to be the effects that commonly flowed from that which you tried to relieve by the transurethral method? *A*—What effect?

Q—Yes, what was the bad effect on the patient of that old process of removing the gland? *A*—The bad effect?

Q—Yes. *A*—As a rule the results were good. They were removed of their obstruction and able to urinate.

Q—Could they control it? *A*—Yes.

Q—Just the same, as well? *A*—Yes, sir.

Q—You mean that in the older days, back we will say a decade or more ago where that was about the only method used, was it not? *A*—Those two methods.

Q—All right. In many, many instances it was found that it did have a very bad effect in the way of shortening the life of the patient, didn't it? Would you admit that? *A*—Well, I don't know how to answer your question other than to say this, that in the early days of the operation, of course, the mortality rate in prostatic surgery, whether perineal or suprapubic, was rather high, but in the last twenty five years that has been reduced to around 4 to 6 per cent so the good results in those cases whether done one way or another, amounted to 94 to 96 per cent cure.

Q—How long do you say it has been if you know, since the removal of the prostate gland became a practice? *A*—Oh, thirty years.

Q—In other words, it has only been within the last thirty years that they learned to do that? *A*—To any great extent, yes, sir.

Q—Before that do you know what they did? Did they know anything about the enlarged prostate gland? *A*—Before the removal of the gland, as a matter of fact, a hundred years ago a man named Guthrie in England attempted to do what is now being done by the transurethral resection, and prior to that time a Frenchman attempted with another instrument to remove the obstruction through the urethra and some time along in 1870 or 1880 Bottini an Italian attempted to remove the obstruction by a cautery, so the thing extends over a long period of time.

Q—But you say the operation hasn't been being performed and removed over about thirty years? *A*—Yes.

Q—I am talking about among the American profession what did they do before that for it? *A*—They usually didn't do anything for it or else they put a tube in the bladder above and let the urine drain out that way. The patients were allowed to continue to carry that tube the remainder of their lives.

Q—Didn't they sometimes practice castration? *A*—That has been used from time immemorial.

Q—To try to relieve that trouble? *A*—With no effect.

Q—But they practiced that? *A*—Many different efforts were made to do it.

Q—Within the past slightly more than a decade the transurethral method has become into rather common use hasn't it? *A*—Yes.

Q—And that is recognized as one of the methods isn't it? *A*—No.

Q—It is of course, a rather severe surgical operation, isn't it? *A*—No.

Q—It is a surgical operation? *A*—You said a severe one.

Q—I am not speaking about mortal but isn't it? Please answer, is it?

Q—Doctor. *A*—It is not unpleasant. They have no pain whatever with it.

Q—Well, you would say the same thing of any other abdominal operation wouldn't you of any abdominal operation? A—No, I would not.
Q—At any rate, if there is a way, if medical science and skill and research can find a way to lighten that operation it would be a great boon to humanity, wouldn't it to perform an easier operation that would cause the patient less loss of time and less likelihood of danger and all that it would be a boon to humanity, wouldn't it? A—Yes, sir.
Q—You don't deny that there are the elements of hemorrhage and infection and shock that are in the transurethral operation? A—No sir I do not.

Q—You mean you say you don't deny it, or there is none? A—We don't deny it.

Q—So of course if that alone could be avoided in an operation where the trouble has not progressed too far, that would be a great boon to suffering humanity, wouldn't it? A—Yes, sir.

Q—Now, Doctor, when did you first get into the matter of this case? When were you connected in any way with any investigation against Dr Brinkley? A—I haven't been connected with any investigation of Dr Brinkley at all.

Q—When were you connected with or talked to first with reference to this case? A—Last Saturday.

Q—Last Saturday? A—Yes, sir.
Q—In other words, Dr Fishbein had not consulted or seen you with reference to the matter until just last Saturday? A—He didn't see me then.

Q—Well somebody did for him? A—If you want to know how—
Q—Was it an investigator? A—No.

Q—By some doctor? A—Yes, sir.
Q—You mean a local doctor in there in your town? A—No sir.

Q—By some one else? A—Yes, sir.
Q—And by— A—If you want to know, it was by Dr Holman Taylor of Fort Worth.

Q—Is he also a member of the American Medical Association? A—Yes sir he is.

Q—Do you know anything about his connection in the past with any opposition to Dr Brinkley? A—I do not.

Q—You don't know anything about that? A—No.
Q—And when did you come down here? A—I came down yesterday morning.

Q—From— A—Dallas.
Q—From Dallas, at the instance of the defendant? A—Dr Holman Taylor asked me to come down here as a witness in this case.

Q—Well did he do that at the instance of the defendant? A—I don't know.

Q—You don't know? A—No, sir.
Q—You don't know, in other words, whether it was at the instance of Dr Fishbein or of the American Medical Association? A—I do not I don't know where the request originated.

Q—Now, you say that you are a member of the American Medical Association. I want to ask you do you know whether in cases of this character the members are assessed for expense items or they pay or contribute? A—I don't understand your question.

Q—In suits against the American Medical Association or Dr Fishbein do you know whether the American Medical Association, or the members rather are assessed something or charged something? A—No, they are not.

Q—Don't you know that—do you remember or did you know about the instance of the publication by Dr Fishbein against Dr Brinkley about ten years ago? A—I don't recall it if I did.

Q—You don't remember that Dr Brinkley, then, published an article largely along the same line as this one?
Mr Reynolds—Dr Fishbein.

Q—Dr Fishbein I mean, published an article about Dr Brinkley along the same line? A—The one ten years ago I don't remember.

Q—Did you know anything about this suit at that time? A—Oh I knew in a general way about it.

Q—You knew there was a suit filed against him by Dr Brinkley? A—I have a hazy recollection of it. I don't remember any of the details.

Q—You remember about the suit having been dismissed by Doctor when he moved off down here, don't you? A—I don't remember.

Q—Do you remember whether or not you paid at that time anything made any contribution toward the expense of that suit on the part of the American Medical Association? A—I did not. I have never been assessed any special assessment by the American Medical Association.

Q—Do you know whether you were requested to? A—No.
Q—Were you at that time a member? A—I was.

Q—Do you know anything about whether or not all members or what members were asked to contribute at that time? A—I don't think any of them were.

Q—You just don't know about that, is that right? A—I don't know.
Q—And in this instance, of course, this Dr Hood, you say it was? A—Dr Taylor, Holman Taylor.

Q—Dr Taylor having asked you to come, you volunteered to come, didn't you? A—I did.

Q—Paid your own expenses? A—Yes.
Q—And you weren't of course subpoenaed or under a legal process, but you came down here voluntarily to testify in this case for Dr Fishbein is that right? A—Yes sir.

Q—I say at your own expense? A—Yes, sir, I guess it is my own expense so far it is.

Q—Well don't you know? A—No, I do not.
Q—Well did you— A—The matter has not been discussed with me by anybody.

Q—Well did you expect to get your expenses paid? A—I don't expect anything out of it at all.

Q—Have you ever talked to any of the patients in this region at all who have been treated or operated on by Dr Brinkley? A—Yes.

Q—As to the effect of their operation? Here, that is here, any patient in this county or in any adjoining county, we will say, as to what their condition was and what it has been since Dr Brinkley operated on them? A—I don't think in this county. I have had numbers of them from other parts of the state.

Q—Have you ever been to talk to anybody in this region? A—This county.

Q—This county or adjoining counties, this district? A—I don't know how big this district is.

Q—It takes in the adjoining counties. A—Just simply the adjoining counties.

Q—Yes. A—The majority of my practice comes from the central and eastern and northern portions of the state. I don't think I have talked to anybody from here.

Q—Have you ever been down here to Del Rio? A—This is the first time I have ever been to Del Rio.

Q—You weren't here during all the time that Dr Brinkley had his hospital here? A—No, I didn't come down.

Q—You never saw Dr Brinkley's hospital, either here or in Little Rock? A—No.

THE COURT—Counsel, if he has never been here before it necessarily follows he couldn't have seen it.

Mr Morris Sr—I said here or Little Rock.

THE COURT—All right.
Q—You have never talked to the various doctors who serve his hospital? A—I have never seen one.

RE-DIRECT EXAMINATION

Questions by Mr Reynolds

Q—Have you ever been assessed for anything by the American Medical Association? A—No, sir.

Q—To your knowledge has there ever been an assessment for anything? A—No, sir.

Q—Any purpose at all? A—No, sir.
Q—Who is Dr Holman Taylor, at whose request you say you came down here? A—He is secretary of the Texas State Medical Association.

Q—And when and where did you talk to him? A—He called me over long distance telephone last Sunday—I mean last Saturday—and asked me if I would come down here yesterday, and I told him that I would look over my schedule and see if I could rearrange my work and see if I could, and I did, and I phoned him and told him I would.

Q—Prior to the time you arrived here had you discussed Dr Brinkley or the method of his operation with any one connected with this lawsuit, lawyers or otherwise? A—You mean this immediate situation?

Q—Yes. A—No, sir.
Q—Doctor, you say that you never performed this operation which was described to you regarding the cutting off of the small ducts between the testicle and the epididymis. Why not? A—Well, I have never seen any indication or reason to I have operated on many testicles and have removed the testicle or the epididymis entirely, or the vas deferens for tuberculosis of the epididymis, but this operation I have never done at all, this particular operation.

Q—Have you ever done anything like this for the purpose of reducing the size of the prostate? A—No, sir.

Q—Is there the slightest indication, in your opinion, that this operation has anything to do with that sort of situation?

THE COURT—I think that has been gone over.
Q—Doctor, I would like to ask you if one of these patients that they have mentioned to you came to you and told you that as a result of that operation he told you he had been sexually improved, to what would you attribute that feeling on his part?

THE COURT—I don't know how far you propose to go with that but you may open up a field there that I don't think is proper. I don't think individual patients could be brought in here to testify to this and that and the other results.

Mr Reynolds—I withdraw that question and all others like it.
Mr Morris Sr—We expect to give counsel the benefit of that. We expect to produce many of these patients for the purpose of proving by circumstantial evidence the results obtained by the patient.

THE COURT—I will hear you on that later.

RE-CROSS EXAMINATION

Questions by Mr Morris Sr

Q—Doctor, could you before you leave, couldn't you detail to us the symptoms of prostatic trouble in the patient, what the symptoms are?

Mr Reynolds—Just a minute. May we ask counsel to confine that to some type of prostatic condition, because all of these various types, the Doctor could talk at great length on them.

THE COURT—I haven't found the Doctor very verbose so far.
Q—Can you give us what are all of the symptoms of prostatic trouble?

A—Prostatic enlargement?
Q—Yes, trouble with the prostate. A—There are many different kinds of trouble with the prostate.

Q—That is what I want you to do, give us the symptoms of any disease or trouble with the prostate. That is, the symptoms the patient feels. A—Am I at liberty to choose the type of trouble I describe?

Q—I want you to, as briefly as you can— A—The symptoms of all the prostatic diseases?

Q—All the symptoms that the patient feels in diseases of the prostate. A—You are going to be here a long time if you are going to give me that.

Mr Reynolds—Your honor, that is the point of my objection. If he wants to confine it to prostate enlargement, prostatitis or cancer, that is all right, but the subject he asks covers whole books.

Mr Morris Sr—We don't want it confined.
THE COURT—What is the purpose of it?

Mr Morris Sr—We need to know what this doctor claims are the symptoms of prostatic trouble. It is, of course, a matter of proof. First, it is quite material if one comes here and says "I have certain—I feel certain symptoms," and if that man then shows the symptoms which are this particular trouble, if this operation is performed and if afterward all those symptoms are relieved through a long period, of course, those are circumstances of a sort to see whether or not he has—whether or not that operation has helped him.

THE COURT—It seems to me that if that is admissible it is affirmative proof and not admissible on cross examination. They didn't ask him anything about that.

At this time the court and counsel conferred.

THE COURT—All right.

Q—All right, state briefly some of the symptoms, how he suffered? A—Enlargement of the prostate, one of the earliest symptoms is the fact the patient notices he has to get up at night more often than formerly to urinate, two, three, four, five times. That gradually increases and he begins to notice he has a loss of force in his stream, he doesn't urinate as freely and forcefully as he did. He begins to notice he has some discomfort on urinating, and at the end of urinating and then quite a lot of discomfort, and sometimes the pain will be almost unbearable and they have to be relieved one way or another. Those are in brief the main symptoms of enlarged prostate.

Q—Is that where the abdomen—in the region of the abdomen? A—Yes, the bladder and lower part of the abdomen.

Q—You spoke of—that is the hypertrophy or enlargement? A—That is right.

Q—Now, then, give us the symptoms of the prostaticitis. A—That is a much more difficult thing to do. Sometimes it is a vague discomfort in the perineum, or what is commonly known as the crotch, in front of the rectum between the rectum and the scrotum, a discomfort, discomfort in the groins, low down here and the inner side of the thigh, backaches of various kinds, frequency of urination and painful urination and various types of things like that.

Q—And, Doctor, those—of course, that condition after some duration or progress may cause a general involvement of the system so far as the strength is concerned? A—When you get into that you get into a tremendous field. I would be glad to go into it—

Q—I am just asking you. A—Sure, the patient then is a sick individual he becomes uremic, the urine backs up into his kidneys—

Q—I was trying to ask you, it involves a general condition of the patient's health? A—Yes, sir.

Q—Weaker? A—Yes, sir.

Q—Unable to do his work as usual? A—Yes, sir.

Q—And such as that? A—Yes, sir.

RE-DIRECT EXAMINATION

Questions by Mr. Reynolds.

Q—This last statement made by Mr. Morriss involving the general health weakness, inability to do work, isn't it a fact that there are many, many physical conditions to which you would give the same answer that have nothing to do with the prostate? A—Surely.

Q—And you wouldn't diagnose prostatic enlargement on the brief explanation of symptoms which you just told about, would you? A—No.

Q—There are many, many other things that you have to consider, that have to be confined with it? A—Yes, sir.

Q—And you wouldn't diagnose prostatitis from the brief description you gave of it? A—No.

Q—There are many, many other things besides that? A—Yes.

Q—Tell us some other things that might cause—other than prostatic condition—that might cause the urinary trouble? A—Tumor of the bladder can cause it, diverticulum of the bladder. That is a pouch off from the bladder wall which holds a large amount of urine ordinarily. Inflammation of the bladder, ulceration of the bladder and tuberculosis of the kidney, a stone in the urethra, which is the tube that runs from the kidney to the bladder.

Q—That is sufficient. In connection with these other conditions a patient might have a brachyche? A—He might have all of the symptoms we have described except just the difficulty.

Q—I would like to know if prostatic enlargement could be connected with or cause in any way epilepsy? A—I don't think so.

Q—Dementia praecox? A—No.

Q—Hardening of the arteries? A—No.

RE-CROSS EXAMINATION

Questions by Mr. Morriss Sr.

Q—If you have those different symptoms you speak of that might be caused by different conditions correct and efficient clinical examination, pathology, would disclose whether it is—and, of course, a physical examination would disclose to the experienced surgeon or physician whether he had the prostatic trouble, wouldn't it? A—Yes, sir.

Witness excused.

TESTIMONY OF DR. BENJAMIN WEEMS TURNER

Dr. Benjamin Weems Turner stated that he had graduated in medicine, that he had served an internship, that he had done postgraduate study and that he is a member of various special societies.

The testimony then proceeded

Q—Now, Doctor, you know of John R. Brinkley, the plaintiff in this case, do you? A—Yes, sir.

Q—And for how long would you say you have known of him? A—Well, since the World War, I would say about 1918 or 1919.

Q—Well, now, Doctor, during the time that you have known of him have you ever known him to be a member of any of these organizations you have mentioned to which you belong? A—No.

Q—Did you know Dr. Brinkley—did you know of Dr. Brinkley having advertised himself for some time as a goat gland specialist? A—Yes, sir.

Mr. Morriss Sr.—Of course, your honor, the same objection is made to that as to the other witness.

The Court—Yes. Overrule the objection.

Q—Now, Doctor, we would like to know your opinion as to whether or not it is physiologically possible to transplant the gland of a goat, the testis of a goat into the testicle of a man by making a pocket in which it is inserted, or in any manner, and have it still live? A—I would say it is not.

Q—Why not, Doctor? A—Because there would be no way for nature to anastomose the blood and nerve supply.

Q—Now, Doctor, as I understood your answer, it was impossible to anastomose. What does that mean? A—Well, for nature to grow together the ends of the vessels and nerves.

Q—That is what you meant by that? A—By anastomosis, yes, sir.

Q—Why would you say that is impossible? A—Well, for the first reason, that there is no evidence of any of us—no evidence of such ever having been done.

Q—Well, suppose we forget that there is no evidence that it has never been done and say from a scientific and medical standpoint just why, or why it wouldn't be possible? A—Well, the minute vessels that supply this tissue, upon removal, are severed and there is no way to unite them. Therefore the tissue would die.

Q—Well, now, assume that inserting this goat gland into the human gland—an incision is made, from which human blood spurts or comes, anyway, into contact with the goat testicle. Would or would not that fact keep the goat testicle alive for any time? A—It would not.

Q—Further assume, Doctor, that there was some possible method of providing a blood supply, is there any method of providing a nerve supply? A—No.

Q—Well, would the goat gland live in the absence of nerve supply? A—Well, it is possible, I would say.

Q—Would it have any functional activity? A—No.

Q—Now, Doctor, I guess you have answered that there has never been any recorded successful transplantation of any gland of any kind is that right? A—Yes, sir.

Q—In your opinion, would the transplantation, as we have been talking about here, have any effect, any functional effect whatsoever? A—It would not.

Q—Would it have any effect at all upon an enlarged prostate? A—No.

Q—Upon prostatic or other types of cancer? A—It would not.

Q—Upon sexual rejuvenation? A—It would not.

Q—Would it have any effect in treating or curing the type of insanity known as dementia praecox? A—No.

Q—High blood pressure? A—No.

Q—Hardening of the arteries? A—No.

Q—Create energy in a man? A—No.

Q—Would the treatment in any way help or cure epilepsy? A—No.

Q—Locomotor ataxia? A—No.

Q—Neurasthenia? A—No.

Q—Diseases of the stomach, bowels or kidneys? A—No.

Q—Constipation? A—No.

Q—Would it have any effect at all in attempting to cure sterility caused by mumps? A—No.

Q—Can sterility caused by mumps be cured? A—It cannot.

Q—Why not? A—Because the active function of the organ is destroyed by a sclerosis or fibrous tissue.

Q—Now, Doctor, as a result of your questions, what then would you say would happen to this goat gland? A—I would say it would die and form a foreign body of scar tissue and would probably incapsulate by nature's healing effort.

Q—Just leave a hard bump? A—That is all.

Q—Is there any process of nature that would lead you to an opinion as to whether that would finally disappear? A—I would think the larger portion would. There would be a certain amount of scar that would remain.

Q—Now, Doctor, as I understand it, in between this space between the testicle and the epididymis, there is contained some twelve to twenty minute tubes that we call efferent ducts, is that correct? A—Yes, sir.

Q—How long are those, generally? A—Well, they are quite small, they are barely visible, barely detected by the eye.

Q—Can you feel them with your fingers? A—No.

Q—Would it be humanly possible to separate one of these out and tie a piece of linen thread around it? A—No.

Q—Now, I will ask you if tying off all or part of those has ever been—ever been used by you as part of the treatment for prostatic enlargement? A—No.

Q—Or by any other man, that is, a urologist, if you know?

Mr. Morriss Sr.—Just a minute.

The Court—By any one he knows, he asked.

A—Not to my knowledge.

Q—Now, then, Doctor, assume an operation upon an individual who is said to have prostatic enlargement wherein approximately half of these efferent ducts are tied off, wherein a section of the vas deferens tube leading from the epididymis up into the seminal vesicles may or may not be cut out and removed out, and assume that a 2 per cent microchrome solution is injected into the vas deferens that after this operation has been completed, of course, assume that all incisions made are then fixed back together again, sewed up, and postoperative treatment consisting of the intravenous injection of approximately six ampules containing 20 cc each of a substance composed of 1,000 parts of distilled water to one part of hydrochloric acid and also containing a minute amount of blue coloring matter, and that this material is injected into the veins over a period of several days, have you an opinion based upon reasonable medical and surgical certainty, as to whether or not that technique might or could have any effect in relieving prostatic enlargement? A—I would say it would not.

Q—Would there be any purpose in your mind to such an operation, medically and scientifically? A—Not to my knowledge.

Q—Now, Doctor, would that operation in your opinion have any effect on restoring sexual vitality? A—Not to my knowledge.

Q—In your opinion? A—No, no.

Q—And would it have any effect in reducing high blood pressure? A—No.

Q—Hardening of the arteries? A—No.

Q—Would it tend to create energy in men? A—No.

Q—Would it have any effect, in your opinion, on any of these various diseases I named over before? A—No.

Q—All right, Doctor, now, would you say that that method was—strike that. Doctor, this solution about which I spoke, a thousand parts of distilled to one part of hydrochloric acid and also a minute amount of blue coloring in that, is that type of solution considered an isotonic solution? A—That is hypotonic.

Q—Which means what? A—It means less than the concentration level of the blood.

Q—It means weaker? A—Weaker.

Q—Is there any reason in your opinion why a solution such as that—I will change that question. Is there any functional effect in your opinion from injecting a solution such as that into the human veins? A—Well, of course, experimentally it was used a number of years back, four or five years ago, but it was discarded as being an inadequate agent.

Q—That occasion you are referring to was it or was it not of the same proportion I have given you here? A—No, it was a stronger solution.

Q—As a matter of fact, it was about one to five hundred or one to two or three hundred? A—Yes.

Q—But never one to a thousand? A—No.

Q—Have there ever been any indications even with that concentration that it has an effect of combating infection? A—I think it has been disproved in later years.

Q—Incidentally, would an injection of that material have any effect on sexual rejuvenation? A—It would not.

Q—Or on any of these other things I have spoken of? A—No.

Q—Would it have any effect, injecting distilled water into a person? A—Not in that dilution.

Q—Now, Doctor, do you know Dr. John R. Brinkley, do you know his general reputation among men, members of the medical profession?

Mr. Morriss Sr.—The same objection.

The Court—Why don't you fix the time, counsel?

Q—Do you know the general reputation of Dr. John R. Brinkley, among members of the medical profession in February 1938?

Mr. Morriss Jr.—Now, we object to that because it isn't confined to the place of the defendant's residence and for all of the reasons stated before. May that be understood without our restating that?

CROSS EXAMINATION

THE COURT:—You want to take the same objection you took to it before, the other doctor, Dr. Folsom?

Mr. Morris Jr.:—Yes, may we have that?

THE COURT:—I will give you that.

Mr. Morris Jr.:—To all of these questions, unless there is some different line of interrogation, may it be understood that the same objection goes to all of these questions, the same objection goes as was made?

THE COURT:—I understand you are objecting to me allowing them to ask him questions and receive answers with regard to the doctor's general reputation?

Mr. Morris Jr.:—Yes, sir, and to—well, we think that many of the questions which they asked were not questions of general reputation and no proper foundation.

THE COURT:—I am going to overrule the objection you are making now and let him answer.

Q.—Doctor, the question was his general reputation among members of the medical profession in February 1938. Do you know? A.—Well, I don't know just how to answer that question. You mean in regard to—

Q.—As a medical man? A.—Well, it was generally not good.

Mr. Morris Jr.:—The answer was not responsive.

THE COURT:—He wanted to know if you knew his general reputation. If you do, then he will ask you what it is.

A.—Yes.

Q.—Now, what was that general reputation? Don't say "not good," but tell us what it was.

THE COURT:—I think you had better let him answer the question himself.

Mr. Reynolds:—All right, I am sorry.

A.—Well, do you want to put me another question? I mean I don't know just how to answer that.

Q.—Can't you explain to us what you said you knew his general reputation was at that time as a physician and surgeon?

Mr. Morris Sr.:—Ask if it was good or otherwise, that will be all right.

Q.—If the gentlemen will allow a conclusion, good or bad, then. A.—I would say it was bad.

Q.—Do you know his general reputation at that date in circles more particularly confined to urologists and genital urologists?

Mr. Morris Jr.:—The same objection as before. Now, it wouldn't be necessary, and we don't care to interrupt the line of interrogation, if it may be understood we have the same objection which we made to the questions before.

THE COURT:—I think you have indicated, counsel, to the court your objection to this line of procedure. The new rules say all you have to do is to do that to preserve your record. If you want to keep on bobbing up you have the right to do it.

Mr. Morris Jr.:—We said we didn't want to do it.

THE COURT:—You said you didn't want to do it, but you keep doing it. I think you have a record on that.

Mr. Morris Jr.:—Well, your honor, if the court will—

THE COURT:—I am not inaking any agreements with counsel, that is not my province.

Mr. Morris Jr.:—All we want is that it may be understood that the same objections go, or otherwise it is our opinion, we may be in error, but it is our opinion that in order to properly preserve our record we must object.

THE COURT:—Well, counsel, you had better preserve your record as you want. I am not objecting to your objecting.

Q.—Doctor, the last question was confined to the same date, but confined also to urologists and genital urinary surgeons. A.—I would say generally unethical or bad.

Q.—What do you mean by unethical? A.—Well, there are certain ethics in religious and medicine and ethics are standards by which we are mutually controlled. We call that the ethics.

Q.—Are you referring only to advertising in that connection? A.—No, I would say in general.

Q.—Did Dr. Brinkley have a reputation, either among the medical profession or these more confined groups, at that time as being a prostatic specialist?

Mr. Morris Jr.:—We object to that as leading and suggestive and not being properly confined to the place of the residence and as being confined to a particular group rather than his general reputation, and as being duplicitous as it inquires as to several groups.

THE COURT:—Do you think his reputation would have to be confined to Val Verde County?

Mr. Morris Jr.:—We think that is the proper test, yes, sir.

THE COURT:—He has testified himself that he has been licensed to practice all over the country and he has issued literature that he has performed operations all over the world and he is known internationally, and I don't think you can tie that down just to Val Verde County.

Mr. Morris Jr.:—That is our view.

THE COURT:—Overrule the objection.

Mr. Morris Jr.:—Either that or where he has lived or practiced his profession, in that community.

THE COURT:—He sketched here yesterday that by advertising over the radio he drew patronage from a portion of the country he delineated here that goes up to the Great Lakes and portions of Pennsylvania, and I don't believe you can limit that.

Mr. Morris Jr.:—We also object also to being confined to a particular portion or group in any given locality and not confined to his general reputation in that respect, but only as among a particular group. You might ask if some member was in bad repute with a club or something like that.

THE COURT:—I don't think that is analogous. Overrule the objection.

Q.—Doctor, the question was if at that time and in those circles, the medical profession generally, he had a reputation of being a prostatic specialist? A.—You said did he have?

Q.—That is right, did he have? A.—In our association?

Q.—In medical—in the medical profession generally or in the circles confined to urologists and genito-urinary surgeons, during February 1938? A.—No.

Q.—Did he have a reputation of being a genito-urinary surgeon or specialist in that?

Mr. Morris Jr.:—The same objection to that.

A.—No.

Q.—Did he have the reputation, if you know, of being the greatest prostatic specialist in the world? A.—No.

Mr. Morris Jr.:—The same objection.

Q.—Does he have that reputation now? A.—No.

Mr. Morris Jr.:—Now, we object to the last question as being irrelevant and immaterial to any issue in the case.

THE COURT:—All right.

Mr. Morris Jr.:—Not confined to the proper time.

Questions by Mr. Morris Sr.:

Q.—Doctor, you have been practicing in Houston how long? A.—Twenty-six years.

Q.—And you have been a member of the American Medical Association how long? A.—Twenty-seven years.

Q.—Who asked you to come here, Doctor? A.—Who asked me to come?

Q.—Yes. A.—The secretary of the State Medical Association of Texas.

Q.—What is his name? A.—Holman Taylor.

Q.—In other words, he telephoned you? A.—Yes, sir.

Q.—And now, Doctor, you have spoken about the gland operation. What experience have you had in that particular operation, observing it or performing it yourself, that counsel asked you about? A.—Well, I haven't done any of the performing of the operations, but I have observed some that have been performed.

Q.—But I am asking you if you have had any particular observation yourself of the operation or in performing it yourself, you have never performed it or been present at it? A.—I have not.

Q.—Now, Doctor, there has been a very great advancement in the profession in the past thirty to forty years through all manner of experimentation, has there not? A.—Yes.

Q.—You would say that there has been more advancements in the profession of medicine and surgery in the past thirty or forty years than all the history we have record of before, wouldn't you? A.—That is very true.

Q.—And, Doctor, they have been doing a great deal of transplanting in late years? For instance, transplanting skin and bone and such as that, haven't they? There has been a great deal of that, and flesh? A.—It isn't transplanted, it is grafting.

Q.—Grafting it is the same thing? A.—No.

Q.—You cut it off one person or place and transplant it to the other part on the other person and it successfully attaches and grows on there, doesn't it? A.—It does in instances in which it is possible to perform.

Q.—That is what I mean, and there has been a vast deal accomplished to the human in that respect, to the human good, in later years, hasn't there doctor? A.—There has been no instance of tissue like that being transplanted.

Q.—I am asking you about transplantation. A.—Yes, of skin and bone.

Q.—And, Doctor, in reference to the operation—operations for or treatment of the prostate gland, there has been a great advance made throughout the period of the last thirty years in that, hasn't there? A.—Yes.

Q.—A little bit back of that time or just behind that time, about the first thing they usually would do was castrate, and that wasn't satisfactory, was it? A.—That dates back a hundred years.

Q.—How far back would you say the practice, the common practice, I mean the practice among specialists of that line, the practice of the complete removal of the gland dates back? A.—The early fifties.

Q.—Well, it wasn't practiced in our region here with any degree of generality until the last thirty-five or forty years, was it, Doctor? A.—Well, fifty, maybe, or sixty or seventy.

Q.—And many, many now perform what is called the transurethral operation, the transurethral operation? A.—Yes.

Q.—In severe cases of prostatic trouble? A.—Yes.

Q.—Those operations are rather common, aren't they? A.—Yes, they are.

Q.—That is where you go through the urethra and you cut away or whittle away—in other words, what is called a reaming operation, isn't it? A.—Yes, you might call it that.

Q.—And, of course, when it is bad enough the only way yet is to take it out, isn't it? A.—I didn't get that.

Q.—When it is bad enough you can't do it that way, the only method then generally is to take out the entire—that is, the abdominal operation which removes the gland entirely? A.—Well, of course, there are a number of methods that are accepted as treatment for prostatic enlargement, and transurethral is only one of three accepted and approved methods. That is limited to a certain group.

Q.—And then the removal, the complete removal by the abdominal process? A.—It is impossible to completely remove the prostate by any method.

Q.—You say that you remove all you can get if it is diseased? A.—The hypertrophy portion.

Q.—In the transurethral you don't remove it all, do you? A.—No.

Q.—Then, Doctor, of course, any method—for relief of that very common trouble which would spare the necessity of the operation, even the transurethral, would be a great boon to humanity, wouldn't it? A.—It certainly would.

Q.—And, Doctor, any experimentation and finding out a way for human relief, you accomplish it by trying the operations and noting the results, don't you? A.—You do.

Q.—And of course if you operate some method upon a large number of persons and you find a very high per cent of satisfactory results, then that is about the best way to know that that operation is successful, isn't it? A.—That is the way we all judge ourselves, of course, by statistical data which is compiled by the group.

Q.—Now, Doctor, what is it that causes prostate enlargement? A.—That is something that none of us know.

Q.—You just don't know what does cause it, but it is very common, isn't it? A.—We think, we have our ideas.

Q.—It is very common, isn't it? A.—It is in certain stages of life.

Q.—Well, be more specific, Doctor, what stages? A.—Well, the fifties, sixty and seventy years.

Q.—Well, what are your ideas about what causes it? You spoke about your ideas. A.—Well, you have to go into the usual accepted principles that are written in our books. It is a tumorous hypertrophy or enlargement or increase in the elements of the prostate in which it grows as a tumor.

Q.—Well, but does that get back to the question of what causes, what causes the growth? A.—I don't believe there is anybody that has ever written a positive statement on it.

Q.—I thought you said you had your ideas, aside from whether— A.—Well, my idea wouldn't be worth much individually, except what I can prove.

Q.—In other words, you wouldn't be able to express any opinion of your own as to what does cause it? A.—Well, it is analogous in life to the change in the female. It is ordained by nature, which we haven't solved. It is the change of life.

Q.—That is your idea of the only cause? A.—That is the accepted cause.

Q.—All right. Now, then, Doctor, is that some unbalancing of the male and female sexual hormones which might cause it, is that what it is? A.—It isn't all. It is one of the many hundreds of theories that have been propounded. It is not an accepted theory.

Q.—You mean there are many hundreds of theories that have been advanced as to what causes it? A.—Well, they have in due course of time.

Q.—So it is a matter the profession is largely in the dark about yet, is that it, Doctor? A.—I think that the accepted present status is due to the so-called change of life in the male.

Q.—Would that be akin to the unbalancing of the sex hormones in the male? In other words, the male and female sex hormones in the individual, that is what you mean by that? A.—Not necessarily. As I just stated, there is one theory, that is one theory that has been advanced by a certain group of physicians, and hasn't been accepted.

Q.—You wouldn't say that isn't it? A.—It never has been proven.

Q.—Now, Doctor, you have been pretty closely connected with the medical associations, the American Medical Association and these other associations, for a good many years? A.—Yes.

Q.—I assume you have had business dealings with the association, the American Medical Association? A.—Yes.

Q.—And communication and association in that association with Dr. Fishbein, known him? A.—Yes.

Q.—And, Doctor, you don't know, or did you know, whether Dr. Brinkley was ever a member of the American Medical Association or not? A.—Yes, I think he was.

Q.—Do you know how long? A.—Well, I never had occasion to check up on it. I think up until some time when he was at Milford, Kansas. I don't know what the dates were.

Q.—Well, it was about the time he began radio announcements of his operations, wasn't it? A.—Those dates I don't recall.

Q.—Now, Doctor, did you or not have any personal acquaintance with him then or at any time have you ever had any personal acquaintance with him? A.—No, sir.

Q.—Have you ever been to his hospital while it was at Milford, Kansas, to go through it or to see anything about his work? A.—No.

Q.—It is in evidence that he had his hospital here from 1933 up to last year. Did you ever have occasion to visit his hospital here? A.—No.

Q.—Or to talk with him? A.—No.

Q.—Or with any of his physicians or nurses or employees of the hospital, as to the nature of his operation and the work? A.—No.

Q.—You have, then, no first hand information or knowledge whatsoever about the work or about his operations? A.—Oh, yes.

Q.—I say you have no first hand information, all you know is what somebody away who didn't do the work or wasn't present has told you, is that all? A.—Well, the first time that I ever learned of his procedure was through a group of physicians at Wichita, Kansas, at the time Dr. Brinkley was in Milford, Kansas.

Q.—I am talking about you never had any contact with his hospital or him or any of his co-operators or anything of that kind? A.—No.

Q.—You are a supporter and member of the American Medical Association, you say? A.—Yes, sir.

Q.—And of Dr. Fishbein's faction, we might call it, in that organization? A.—I didn't know there were any factions.

Q.—Well, you do know that there are many factions, that is to say, there are many controversies inside the medical association about policies and matters of that kind, you know that, don't you? A.—Oh, there might be on minor points, but the general setup, of course, is well organized.

Q.—Well, you do know that there has also been very considerable discussion and controversy inside the association and out about some of Dr. Fishbein's operations? I don't mean physical operations on people, I am talking about his policies, in the last year or so, you know that, don't you? A.—I do not.

Q.—You have read about those protests, haven't you? A.—I haven't.

Q.—You are acquainted with them? A.—No.

Q.—Had you read the book that—

THE COURT:—Counsel, I think that is entirely collateral matter.

MR. MORRIS SR.:—I beg your pardon.

THE COURT:—I think those are collateral matters.

MR. MORRIS SR.:—Yes, sir, I think it is unnecessary, your honor. That is all.

RE-DIRECT EXAMINATION

Questions by Mr. Reynolds:

Q.—You testified here regarding a certain type of operation in which these little ducts were tied off and so forth. In your opinion is that operation, does that operation have anything about it at all that indicates that it could or might be this great boon to humanity that Mr. Morris asked you about?

MR. MORRIS JR.:—Just a moment. That question is improper, argumentative, leading and suggestive. We object to it for all those reasons.

THE COURT:—Overrule the objection.

MR. MORRIS JR.:—Note the exception.

Q.—Will you answer the question? A.—I would say it could not.

Q.—After hearing about that operation have you yourself any particular desire to pursue its study further?

MR. MORRIS SR.:—I didn't get that.

MR. REYNOLDS:—I asked him if he had any desire to pursue that study.

A.—(No answer.)

Q.—Now, Doctor, several things here were said about grafting skin and bone. Is there any difference between the theories and physical structures underlying the grafting of skin and bone and that of glands such as the testes? A.—It is a very marked difference.

Q.—Will you explain that just in a general way, in common language so we can get an idea of it? A.—Well, of course, skin and bone is known as structural nonfunctioning, relatively. Of course, you get out in deep water when you go to describe any of these structures. But the grafting of skin and bone by transplantation, that can be done, but if you attempt to remove an organ you destroy its blood supply and nerve supply, and it is humanly impossible to unite, anastomose or join together these life giving properties which come through the blood supply and nerve supply.

Q.—Do you know of any recorded case of successfully transplanting any gland or any organ? A.—Not on record.

RE-CROSS EXAMINATION

Questions by Mr. Morris Sr.:

Q.—Doctor, what about the grafting of the cornea of the eye? A.—That is analogous to the skin.

Q.—I say they are doing that? A.—Oh, yes.

Q.—Is that skin? A.—It is analogous to it.

Q.—What is the cornea composed of? A.—It is composed of an epithelium cover. It is analogous to a covering of skin.

Q.—And they do perform the operation very frequently now, removing the eye and operating on it and putting it back, don't they? That is a common operation? A.—No.

MR. REYNOLDS:—I object to that. That has nothing to do with it. It is just prolonging it, whether you pull out an eye and operate on it.

THE COURT:—Just a minute. Maybe he is about through. Is that all, counsel?

MR. MORRIS SR.:—Yes, sir.

Q.—You know that Dr. Stailey of San Quentin is a member of the A. M. A., you know of him and know who he is? A.—Yes, sir, the penitentiary physician.

Q.—I will ask you if he hasn't reported some 10,000 goat gland operations? A.—No.

Q.—Do you know that? A.—He reported some 10,000 vasectomy operations. That has nothing to do with goat glands.

Q.—Just what are the 10,000 operations he speaks of? A.—It consists of removing a portion of the vas, which is the tube that carries the sperm from the testicle, and sterilizes the inmates of the penitentiary.

Q.—Have you ever attempted or done that operation, Doctor? A.—I have.

Q.—And has he done that operation with success, this doctor, is he reported to have done that operation with success? A.—Yes, sir.

Q.—In other words, Doctor, there is a vast amount of experimentation going on and constantly being carried forward in the interest of medical science, some of which after a time are abandoned and some of which are carried forward successfully, isn't that true? A.—Yes, to some degree.

Q.—And in that connection, as you said, the greatest amount of experimentation and greatest amount of advancement has come within the past thirty or forty years? A.—Yes.

Q.—And now, with reference to that and in recent years, the animal secretions or the secretions of the animal glands have played a very large part, haven't they? A.—Gland extracts, you mean?

Q.—Yes. For instance, you speak of the thyroid. That has been learned in late years, and you may by reason of the thyroid secretion, that is adding more or less—you learn how to make the stout person thin and the thin person stout by the same medicine, don't you, Doctor? A.—Yes.

Q.—You have learned that, haven't you, Doctor? A.—Yes.

Q.—What is the thyroid gland secretion, what is it they use, what is that, the thyroid medicine, what is it an extract of? A.—It is extracts of the thyroid gland dried, desiccated.

Q.—What animal? A.—Various animals. I think mostly Mr. Armour handles it through his plant.

Q.—What animals, Doctor? A.—I don't know for sure.

THE COURT:—What is the relevancy of that?

MR. MORRIS SR.:—I will just ask this further question.

THE COURT:—I know, but I have been in hopes counsel would turn loose some time. I believe you are a long way afield.

MR. MORRIS SR.:—I will be through with this one question.

Q.—The same thing with reference to the sex glands, they have used that a great deal in the last few years, haven't they, and the hormones?

A.—The thyroid is the only successful gland to date. There are some other glands that have been used.

Q.—Been used by many, many of the very best recognized physicians, too, aren't they, Doctor? A.—With limitations, and it depends on which ones are used. Some of which have been proved to be no good.

Q.—Yes, but many of them are accepted now and are being used by the best physicians? A.—Yes.

RE-DIRECT EXAMINATION

Questions by Mr. Reynolds:

Q.—Doctor, what is it that Dr. Sterling did and was that experimental in any way, or Dr. Stailey, at the penitentiary? A.—It was not experimental at all, it was a resection of a portion, of a portion of the vas, which was done by physicians seventy-five years ago and a hundred years ago.

Witness excused.

At this time a short recess was had, at the conclusion of which the following proceedings were had, in the presence of the jury:

TESTIMONY OF JOHN MANNING VENABLE

Dr. John Manning Venable testified as to his qualifications by stating his medical education, including graduate work and his membership in various medical organizations and on hospital staffs. The testimony then proceeded:

Q.—Do you know of John R. Brinkley, Dr. John R. Brinkley, the plaintiff in this case? A.—I have heard of him.

Q.—Has he, to your knowledge, ever been a member of any of these organizations you have named? A.—No, sir.

Q.—Now, you know Dr. Brinkley used to advertise himself as a goat gland specialist, do you? A.—Yes, sir.

Q.—In your opinion, Doctor, is it possible to transplant—

MR. MORRIS JR.:—Your Honor understands the same objections go to this.

THE COURT:—Yes.

Q.—In your opinion is it possible to transplant the gland of a goat, the testis into the testis of a man by inserting it in a pocket or by any other method? A.—No, sir.

Q.—And that is have it still live, I mean to say? A.—I understand you, sir.

Q.—Why is that your opinion? A.—Because it is unsuitable ground for a graft or transplanting.

Q.—Now, will you explain a little more specifically the fact that it is unsuitable ground. A.—Because the place in which it is put in the testicle, the testicular tissue, is not such to afford adequate blood and nerve supply to a graft to make it live.

Q.—What kind of cells are testicles of goats composed of? A.—I beg pardon, sir?

Q.—Of what kind of cells are testicles of goats or the testes of goats composed? A.—Epithelial cells.

Q.—Is that the same kind of cells of which human skin is composed? A.—No, sir.

Q.—Or human bone? A.—Not—no, I wouldn't say it was.

Q.—Now, Doctor, assume that in the transplanting process a pocket is cut into the human testicle and as a result human blood comes into that pocket into which the goat gland has been inserted. Wouldn't that furnish a blood supply to keep the goat gland alive? A.—No, sir.

Q.—Why not? A.—Because that is blood that is from cut vessels. That is not going to stay in there.

Q.—Would it even furnish temporary life? A.—No, sir.

Q.—In transplanting the goat gland in that method is it possible for the goat gland—the goat gland nerves to function? A.—No, sir.

Q.—Is there any way in which they can be connected, either—

Mr. Morris Sr.:—I would suggest that counsel not lead the witness altogether.

THE COURT:—Counsel, inasmuch as this evidence is more or less cumulative, I think it desirable to lead him unless you object seriously.

Mr. Morris Sr.:—I just wondered if you couldn't avoid leading him.

THE COURT:—I think this is repetition, and I think this is about the last evidence of this kind that the Court will allow.

Mr. Reynolds:—This is the last witness we intend to put on this.

THE COURT:—All right, go ahead.

Q.—Doctor, is there any way that the nerve in the testicle can be attached to the human nerve, either artificially or naturally? A.—Please frame that again.

Q.—I am asking if there is either natural or artificial methods whereby the nerve in the testicle of the goat can be connected with the nerve in the testicle of a man? A.—No, sir.

Q.—What is it that makes tissue live? A.—Nourishment from the blood and nerve supply.

Q.—And it is a fact, isn't it, that the blood has to circulate through the tissue? A.—Yes, sir.

Q.—The mere presence of it doesn't help? A.—No, sir.

Q.—To your knowledge, Doctor, has there ever been a recorded successful transplantation of any gland from animal to man or man to man? A.—No, sir.

Q.—Now, Doctor, in your opinion would the transplantation of this goat gland as described, whether or not accompanied by any other technic, would that transplantation itself, have any effect at all on reducing an enlarged prostate? A.—No, sir.

Q.—Would it have any effect upon any of the following diseases or dysfunctions: high blood pressure, hardening of the arteries, impotency, that is sexual inability; would it create energy, have an effect on epilepsy, locomotor ataxia, constipation, diseases of the stomach, bowels and kidney, insanity of the type known as dementia praecox, neurasthenia or sterility in man caused by mumps? A.—No, sir.

Q.—As a matter of fact, can sterility caused by mumps be cured in any way? A.—No, sir.

Q.—And that is because the organ is dead, is that right? A.—Yes, sir.

Q.—Would that or not have any effect on cancer? A.—No, sir.

Q.—On any type of insanity? A.—No, sir.

Q.—What would be the results or effect of the transplanting of that goat gland, what would happen to it? A.—Nothing.

Q.—Well, would it just stay there, or what? A.—It might be—it would be absorbed, in the event there was no infection it would be absorbed, gradually would become converted into fibrous tissues and be gradually more or less absorbed. There might be a little fibrous tissue left, but not much, where the transplant was placed.

Q.—You said providing there was no infection. Could that gland cause infection? A.—Not if it was aseptic technic.

Q.—By that you mean a sterile operation? A.—Yes, sir.

Q.—Now, Doctor, regarding the little ducts or tubes between the testicles and the testes and the epididymis that lies along the top of it like a finger, how large are those? A.—I would say about the size of a thread or smaller. They vary in size.

Q.—In the ordinary individual can you feel them with your hands? A.—No, sir.

Q.—Is it reasonably possible that you can tie off any one of those with a piece of linen thread? A.—No, sir.

Q.—Assuming, however, this could be done, would the tying off of part of them in itself have any effect upon an enlarged prostate? A.—No, sir.

Q.—What would be the effect of tying off all of them? A.—On one side?

Q.—Assume just one testicle, yes, tie off all those. A.—That side would get no more sperm around it, around to the urethra.

Q.—The same thing as a sterilization operation? A.—Yes.

Q.—A sterilization operation, as one is quite commonly done, is done higher up by taking out a section of the vas deferens, is that right? A.—Yes, sir.

Q.—Now, Doctor, assume an operation upon a patient who is said to have a prostate enlargement, where half or more of these little ducts on each side are tied off and where a part of the vas may or may not be cut out or removed, where there is an injection of 2 per cent mercuriochrome solution into the vas deferens; that after that operation the post-operative treatment included the injection in the vein of a man over a period of several days the contents of 720—six ampules containing about 0.0 cc., composed of a thousand parts of distilled water to one part of hydrochloric acid and also a minute amount of blue coloring matter, have you an opinion as to whether or not that entire technic might or could have any effect upon an enlarged prostate? A.—It would not.

Q.—Is there any indication in any of those steps there that it is directed toward reducing an enlarged prostate? A.—No, sir.

Q.—Now, Doctor, this solution of 1,000:1 distilled water-hydrochloric acid, and a minute amount of blue coloring material, is that what is known as an isotonic solution? A.—No, sir.

Q.—It is hypotonic? A.—Yes.

Q.—Which means it is much weaker than isotonic? A.—Yes, sir.

Q.—As a matter of fact, is there any appreciable difference between that solution and distilled water? A.—No, sir.

Q.—Is there any point, therapeutically, that is directed toward the treatment of healing, in your opinion, of injecting a solution of that kind into a man's veins? A.—No, sir.

Q.—Would that have, in your opinion, any effect upon restoring sexual vitality? A.—No, sir.

Q.—Well, Doctor, I will ask you this question again, now. That operation I described where the ducts were tied off and so on, in your opinion would that operation have any effect on high blood pressure, hardening of

the arteries, impotency, epilepsy, locomotor ataxia, constipation, diseases of the stomach, bowels and kidneys, neurasthenia, or any of them? A.—This is the injection of this liquid?

Q.—No, it is the whole technic. A.—No, it would have no effect.

Q.—Would it have any effect in remedying sterility caused by mumps? A.—No, sir.

Q.—As a matter of fact, that sterility caused by mumps cannot be restored at all, can it?

THE COURT:—That has been gone over.

Mr. Reynolds:—I am sorry.

Q.—All right. Now, Doctor, do you know Dr. John R. Brinkley's general reputation among members of the medical profession as a whole in the United States, in February 1938?

Mr. Morris Sr.:—Just a moment. There is a new objection now. The same objection, by the way, but he says does he know. He can only know that if he knows the medical profession. He said among the medical profession as a whole.

Mr. Reynolds:—Perhaps my language is bad.

THE COURT:—Counsel wants to reframe his question.

Q.—Do you know Dr. Brinkley's general reputation among the members of the medical profession of the United States during February 1938?

A.—Yes, sir.

Mr. Morris Jr.:—Just a minute. The same objection to that as heretofore.

THE COURT:—All right, overrule the objection.

Q.—Answer the question yes or no, Doctor. A.—I do know it.

Q.—What is that reputation? A.—The reputation of making claims that are not substantiated by results.

Q.—Do you know his general reputation among urologists and genito-urinary surgeons for that same time? A.—Yes, sir.

Q.—What is that? A.—The same.

Q.—Does he have a reputation among either of those groups, or did he on that date, or does he now, as the greatest prostatic specialist in the world? A.—No, sir.

Q.—Does he have a reputation as a prostatic specialist at all? A.—No, sir.

Q.—Does he have a reputation of a genito-urinary surgeon at all? A.—No, sir.

Q.—Doctor, what in your opinion—no, strike that. Doctor, do you know what in the medical circles and the public generally is usually and customarily and usually understood by the word quack?

Mr. Morris Jr.:—Now, we object to that, if the Court please, on the ground that what is usually and customarily understood among the medical profession wouldn't govern at all.

THE COURT:—He asked if he knew what was understood by the medical profession and the public generally by the word quack.

Mr. Morris Jr.:—As we understand it, it is the province of the Court to instruct the jury what quack means.

THE COURT:—What quack means?

Mr. Morris Jr.:—Yes, sir.

THE COURT:—I don't think so.

Mr. Morris Jr.:—We have authority for that.

THE COURT:—It may be, but I think the common significance of the word, the idea that it would carry to the public generally, is what governs it. For instance, if I said you were a bum the public generally has an idea what it means. You might get four or five definitions of that from different people, but in the last analysis it is what the public generally and reasonably would think the word meant, the significance that is carried by the word to them. You can go to the dictionaries, I think, and get five or six definitions of the word quack, depending on what dictionary you go to. You could go to the law books and get definitions. You could get different definitions from the doctors. I am subject to correction if you can show me. It is my idea what would the general public get from the language. If you said a doctor was a quack just as if you were speaking of a lawyer if you said a lawyer is a shyster, what would the significance of that be? Ten lawyers might give you ten different definitions of a shyster, but the general public has an idea what it means.

Mr. Morris Jr.:—Where a term is colloquial and has no established definition I think the Court is incorrect.

THE COURT:—I might be wrong, but I am going to let him testify. I think the public in general and the medical profession think a quack is what they think it is. Go ahead.

A.—What a quack means. A quack is one who presents claims that cannot be substantiated by facts nor results.

Q.—Doctor, in your understanding is it usual and customary for members of the medical profession, if you know, to advertise their remedies and treatments? A.—Commercial advertising?

Q.—Yes. A.—No, sir.

Q.—You know that Dr. Brinkley does do that? A.—Yes, sir.

Q.—Does that in any way enter into your definition of the word quack? A.—Not necessarily, no, sir.

CROSS EXAMINATION

Questions by Mr. Morris Sr.:

Q.—Doctor, who got you to come out here? A.—I beg pardon, sir?

Q.—Who got you to come out here? A.—The American Medical Association.

RE-DIRECT EXAMINATION

Questions by Mr. Reynolds:

Q.—Did you have any correspondence or instructions or communications of any kind from the American Medical Association? A.—No, sir.

Q.—Do you expect to be compensated in any way from the American Medical Association for coming here? A.—No, sir.

RE-CROSS EXAMINATION

Questions by Mr. Morris Sr.:

Q.—Doctor, when did you learn about this matter of this doctor being present to witness the gland operation up in Kansas? A.—When did I learn about it?

Q.—Yes. You must have learned about that today, didn't you? A.—It was yesterday, sir.

Q.—Whom did you learn that from yesterday, Doctor? A.—I saw that in the report from Mr. Harrell.

Q.—Doctor, did you say you just came today at the instance of the American Medical Association? You are coming out here at your own expense, is that right? A.—Yes, sir.

Witness—Excused.

(To be continued)

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MAY 20, 1939

"THE CHALLENGE OF APPENDICITIS"

A "challenge" is what Reginald Fitz¹ calls appendicitis. His father² in 1886 first emphasized in this country the importance of early removal of the inflamed appendix in order to lower the mortality which follows perforation with its resultant peritonitis. In the more than fifty years that has elapsed, the teachings of the earlier Fitz have been abundantly verified and confirmed by countless clinical observations. The way seemed clear to remove the inflamed appendix from our mortality records as a common cause of death, particularly since, with the development of modern surgery, appendectomy in itself is associated with a mortality which is practically nil. Still true today as it was fifty years ago, however, the deaths which occur from acute appendicitis are found only in those patients who have developed a peritonitis from perforation.

The mortality from acute appendicitis has risen sharply during the past few decades. This constitutes the "challenge of appendicitis." The data illustrating this increasing mortality are not difficult to find. The experience of individual states has been particularly striking. For Massachusetts, Fitz¹ presents data which show a sharply increasing mortality curve from 1908 to 1932. He states that, whereas in 1900 only 243 patients died of acute appendicitis, by 1936 it had risen to 490; there was a higher peak in 1930, when the deaths totaled 610. Horsley³ for the state of Virginia quotes similar statistics; he noted that the death rate from appendicitis rose from 6.4 per hundred thousand in 1913 to 11 in 1930; it was 10.1 in 1935. Startling data have recently been reported by Krech,⁴ who points out that in six large American cities the mortality rate from appendicitis has increased in one year from 14.3 per hundred thousand in 1935 to 17 in 1936. In one metropolis the rise was more pronounced, from 14.5 to

23.5 deaths per hundred thousand. These figures are from cities having ample hospital facilities and grade A medical schools; obviously these advantages are not being fully utilized. Hudson⁵ has pointed out that, of every twenty children who die, one dies of acute appendicitis. Indeed, the large proportion of the deaths in his disease unfortunately occur in children and young, healthy adults, a factor which makes the challenge even more alarming. In the entire United States more than 16,000 deaths are recorded as produced by appendicitis in 1936; this is a total 50 per cent greater than all deaths due to pregnancy and childbirth in the same period.⁴ In several communities the problem has been considered important from the public health point of view and vigorous educational campaigns and propaganda have been instituted in order to educate the public to help meet this challenge.

Education of the public about appendicitis applies to the most important two factors responsible for the increasing mortality, i. e. the increasing use of cathartics for abdominal pain and the delay in the diagnosis and treatment of acute appendicitis. Both factors are associated when any one goes to a drug store for relief from a "belly ache" and indulges in catharsis. This point must be repeatedly emphasized; those with abdominal pain must be warned repeatedly against the dangers of the great American habit of purgation.

Early diagnosis, once the public is educated, lies of course in the hands of the general practitioner. Early diagnosis is not particularly difficult and if followed by prompt appendectomy results in an almost 100 per cent recovery. Unfortunately, this teaching in recent years has received a setback by the resurrection of the 40 year old Ochsner or delayed operative therapy. This swing of the pendulum has been initiated by surgeons; they have done so, however, only as a method of reducing the high mortality in patients past the stage of early diagnosis and who are already suffering from peritonitis. Unfortunately, this teaching, though applied by surgeons to a relatively limited group of patients, has produced in the minds of many physicians a change of attitude toward treatment of all types of acute appendicitis. There has been a tendency to postpone operative therapy in all cases instead of urging appendectomy promptly after the onset of the disease. As expressed by F. A. Coller,⁶ "There is one great drawback to advocating any type of delay in the operative treatment of the complications of appendicitis. . . . The bare mention of conservatism in any connection with appendicitis is often misconstrued to mean medical treatment for all appendicitis." A. O. Whipple⁷ says "During the past year I have seen four patients . . . with peritonitis" due to appendicitis which the physicians had treated medically because they had "read a good

1. Fitz, Reginald. The Challenge of Appendicitis, *Ann. Int. Med.* 12: 1442 (March) 1939.

2. Fitz, Reginald. Perforating Inflammation of the Vermiform Appendix with Special Reference to Its Early Diagnosis and Treatment, *Am. J. M. Sc.* 92: 321, 1886.

3. Horsley, J. S., in discussion on Appendical Abscess, *Tr. Am. S. A.* 56: 362, 1938.

4. Krech, Shepard. Appendicitis as a Public Health Problem, *S. Clin. North America* 19: 273 (April) 1939.

5. Hudson, H. W., Jr. Acute Appendicitis in Children. The Challenge of Its Continuing High Mortality, *New England J. Med.* 212: 670 (April 11) 1935.

6. Coller, F. A., in discussion on Appendical Abscess, *Tr. Am. S. A.* 56: 361, 1938.

7. Whipple, A. O., in discussion on Appendical Abscess, *Tr. Am. S. A.* 56: 366, 1938.

deal of literature recently about conservative treatment of appendicitis." Birnie⁸ finds that this change in point of view has even reached the medical schools; he says "I have been extremely shocked and disturbed at the state of mind of a good many of the interns . . . high-class men . . . [who] seem to think that in all cases of acute appendicitis there are two courses open: you can operate at once or you can use the deferred treatment. . . . Something is radically wrong with the teaching of today if medical students are sent out with the idea that in these cases of appendicitis it is perfectly safe to wait."

From these expressions it seems that there is a growing failure to realize the importance of the old teachings of Fitz.² As stated succinctly by William Osler,⁹ "There is no medicinal treatment of acute appendicitis." That the situation at present is actually contrary to this teaching is shown for example by Hudson,⁵ whose observations are particularly distressing; he found in 100 consecutive admissions for acute appendicitis at the Boston Children's Hospital that only twenty-eight patients were sent to the hospital within twenty-four hours of the onset of pain; significantly all but one recovered rapidly after appendectomy. It was entirely among the remaining seventy-two who entered the hospital more than twenty-four hours after the onset that complications and death occurred. Elman,¹⁰ in a study of peritonitis from ruptured acute appendicitis at the St. Louis Children's Hospital, has emphasized that the delayed operation should be reserved for a small group of patients. In children admitted in good general condition prompt appendectomy is followed by the lowest mortality "whether the appendix is actually ruptured or not." He further emphasizes the difficulty of deciding in many cases whether or not the appendix is ruptured. From the practical point of view this decision in itself is not important.

Reports in surgical literature as reviewed by Ransom¹¹ do not change but really reinforce the significance of this teaching. The surgeon when he writes of delayed operation in cases of appendicitis refers only to those with peritonitis, cases in which peritonitis should really never have been permitted to develop. The challenge of appendicitis does not concern the treatment in this group; indeed, it concerns the problem of eliminating this group. When all cases of acute appendicitis are recognized early and operation is performed early, no one need die of the results of this disease. Fitz¹ concludes his current paper before the American College of Physicians with this statement:

Appendicitis, in spite of being a fashionable and well studied disease for more than fifty years, continues to slap our faces

insultingly. It is easily recognized. Its treatment, on the whole, is satisfactory, yet it continues to kill each year an unnecessary number of people. May concerted action soon be taken by the American medical profession to meet the challenge of appendicitis and relegate it to the ranks where it belongs: a disease easily diagnosed, of no great danger and, when recognized early and submitted to proper treatment, readily amenable to cure.

ASBESTOSIS

Asbestosis, a definite form of pneumoconiosis, is now generally recognized as an industrial hazard. The first fatal case of asbestosis was apparently described in 1900 by Montague Murray in the *Charing Cross Hospital Gazette*. Cooke's¹ short note in 1924 on the case of a woman dying of asbestosis, and a later paper published in 1927, established asbestosis as a distinct variety of pneumoconiosis.

Asbestos is a fibrous mineral that can be carded, spun and woven. It is a silicate associated most commonly with chrome iron and magnetite. Microscopically asbestos fiber, according to Cooke, is seen to consist of two elements: the bulk of the fiber is translucent and glistening, with here and there black, opaque, angular particles and minute black granules. The dust generated during manufacture consists of these sharp, angular particles and minute granules. Analysis of the dust reveals that the latter are the iron-containing portions of asbestos. These particles, Cooke states, are the "bugbear of the manufacturer, the cause of dust, and a danger to the health of workers in the process of manufacture."

Microscopic sections of the lung in Cooke's case showed an enormous amount of fine granular pigment in the peribronchial fibrous tissue, in the walls of the alveoli, and large, solid, angular particles, which he felt sure were the heavy, brittle, iron-containing fragments of asbestos. McDonald,² in his report on the microscopic appearances of pulmonary tissue in Cooke's case, describes peculiar foreign bodies in the alveoli, bronchioles and interstitial fibrotic areas, to which he refers as "asbestosis bodies." Stewart and Haddow,³ of Leeds and Lynch and Smith⁴ of Charleston, S. C., demonstrated asbestosis bodies in the sputum of asbestos workers.

In a recent paper Sayers and Dreessen⁵ of the U. S. Public Health Service report the results of an engineering and medical study of the health hazards in the asbestos textile industry in North Carolina. They found pulmonary asbestosis to be the principal physical defect in 541 workers whom they examined. The clinical symptoms included progressive dyspnea, variable cough, substernal chest pain, blood streaked

8. Birnie, J. M., in discussion on Appendicitis, *New England J. Med.* 219: 338 (Sept. 8) 1938.

9. Osler, William: *The Principles and Practice of Medicine*, ed. 8, New York, D. Appleton & Co., 1919, p. 538.

10. Elman, Robert: Peritonitis Due to Ruptured Acute Appendicitis in Children: Influence of Delay in the Operative Mortality, *Am. J. Digest. Dis.* 5: 804 (Feb.) 1939.

11. Ransom, H. K.: Delayed Intervention in Appendical Abscess and Spreading Peritonitis Due to Appendicitis, *Internat. Abst. Surg., in Surg., Gynec. & Obst.* 68: 359 (April) 1939.

1. Cooke, W. E.: Pulmonary Asbestosis, *Brit. M. J.* 2: 1024 (Dec. 3) 1927.

2. McDonald, S.: Histology of Pulmonary Asbestosis, *Brit. M. J.* 2: 1025 (Dec. 3) 1927.

3. Stewart, M. J., and Haddow, A. C.: Demonstration of Peculiar Bodies ("Asbestosis Bodies") in Material Obtained by Lung Puncture and in the Sputum, *J. Path. & Bact.* 32: 172 (Jan.) 1929.

4. Lynch, K. M., and Smith, W. A.: Asbestosis Bodies in Sputum and Lung, *J. A. M. A.* 95: 659 (Aug. 30) 1930.

5. Sayers, R. R., and Dreessen, W. C.: Asbestosis, *Am. J. Pub. Health* 29: 205 (March) 1939.

sputum, decreased chest expansion, emaciation, weakness, clubbed fingers or curved nails. Late in the disease the dyspnea becomes distressing, cyanosis may occur and there may be paroxysms of coughing productive of tenacious sputum. The characteristic roentgenographic appearances of the chest indicate granular or ground glass markings, with more or less obliteration of linear pulmonic markings, localized in the midlung and the bases. Single sputum specimen analysis in each case revealed increased incidence of asbestos bodies with increasing dust exposure. Such bodies were found in the sputum of 46.9 per cent of persons whose condition was diagnosed as asbestosis, whereas 24.3 per cent of normal asbestos-exposed persons had these bodies in the sputum. They were not observed in any of the persons surveyed with less than three months' exposure. The more serious forms of the disease were observed in carders, spinners, weavers, twisters, willowers and pickers. Exposures range from 0.10 to 76 million particles per cubic foot. Thirty-nine persons exposed to the concentration below 2.5 million particles per cubic foot did not have asbestosis. The authors felt that if asbestos dust concentrations in the air are kept below 5 million, new cases of asbestosis will not appear. An engineering study by Page and Bloomfield⁶ demonstrated that means are already available for reducing the dust exposure of a majority of asbestos textile workers to less than this amount. The basis of this control is exhaust ventilation near the source of dust.

CARBOHYDRATES AS CONSTITUENTS OF PROTEINS

The first suggestion that carbohydrates may be components of all proteins was made by Claude Bernard, although the basis for this idea was an erroneous interpretation of experimental data. Early in the course of his brilliant studies on the physiology of glycogen, Bernard observed that the feeding of protein to dogs led to an increased deposition of glycogen in the livers of the experimental animals. As this work was done at a time when information regarding either the structure of proteins or the mode of synthesis of sugars in the organism or in the laboratory did not exist, Bernard assumed that the sugar molecule was preformed in the protein and postulated a glucosidic theory of protein structure. However, when the investigations of Lusk and his pupils demonstrated the synthesis of sugar from amino acids, the physiologic basis for the glucosidic structure of proteins disappeared. The presence of carbohydrates in proteins was believed to be limited to a small group of conjugated proteins, the so-called glucoproteins. Despite this view a general lack of agreement prevails as to whether or not the simpler proteins, particularly albumins or globulins,

possess carbohydrate constituents. Early sporadic reports of the isolation of carbohydrates or carbohydrate derivatives from the breakdown of proteins were interpreted as indicating an impure starting material contaminated with carbohydrate. Indeed, investigators of protein chemistry frequently used a negative carbohydrate test as a criterion of the purity of their protein preparations.

Within relatively recent times, investigators have reopened the question as to whether carbohydrates may actually be components of the simpler proteins or are present as impurities in the various preparations. The increasing evidence of the important role of carbohydrates in the determination of immunologic specificity has stimulated interest in the possible role of such groups in influencing the antigenic capacity of proteins. Suggestive indication of the presence of carbohydrate in crystalline egg albumin was presented by Fränkel and Jellinek,¹ who confirmed earlier reports of the presence of a polysaccharide in this protein. Considerable interest was added to this investigation because of the identification of mannose among the hydrolytic products of the polysaccharide, thus making available the first definite evidence for the occurrence of this particular monosaccharide in animal tissues. Repetition of this work by other investigators² led to essentially confirmatory results, with the conclusion, however, that the carbohydrate is not derived from the egg albumin itself but rather from ovomucoid, present in small amounts. Considerable light was thrown on this controversial subject by the introduction of a colorimetric technic, which led to the quantitative detection of carbohydrates in almost all proteins examined.³ This striking announcement of the ubiquitous distribution in nature of carbohydrate components of proteins was received with skepticism. Nevertheless, investigations of the composition of various proteins⁴ have included reports of the actual isolation of carbohydrate constituents. The carbohydrates that have been identified are mannose, galactose and glucosamine, and the amounts of each of these appear to differ in the various proteins. In some, e. g. certain of the serum proteins, the polysaccharide present has been reported to be composed of units having the composition galactose-mannose-glucosamine, while in other proteins, e. g. egg albumin, only mannose and glucosamine are present. The carbohydrate component of egg albumin was critically examined recently by Neuberger,⁵ who demonstrated the integral position of the carbohydrate in egg albumin by a failure to separate the carbohydrate from the protein by denaturation or ultrafiltration. This observation, taken together with the constancy of carbohydrate content on repeated recrystallization of the protein, establishes definitely the firm attachment

6. Page, R. T., and Bloomfield, J. J.: A Study of Dust Control Methods in an Asbestos Fabricating Plant, *Pub. Health Rep.* 52: 1713 (Nov. 26) 1937.

1. Fränkel, S., and Jellinek, C.: *Biochem. Ztschr.* 185: 392, 1927.
2. Levene, P. A., and Mori, T.: *J. Biol. Chem.* 84: 49 (Oct.) 1929.
3. Sorensen, M.: *Compt. rend. Lab. Carlsberg* 20: 3, 1934.
4. Rimmington, Claude: *Biochem. J.* 23: 430 (No. 3) 1929; 25: 1062 (No. 4) 1931. Hewitt, L. F., *ibid.* 32: 1554 (Sept.) 1938.
5. Neuberger, A.: *Biochem. J.* 32: 1435 (Sept.) 1938.

between the carbohydrate and the protcin. By the use of a newly developed technic, it is reported possible to isolate in almost quantitative yield the carbohydrate group of crystalline egg albumin. The properties of the isolated polysaccharide are described in detail. It is shown to have a molecular weight of about 1,200 and to be composed of four molecules of mannose and two of glucosamine, together with an unidentified nitrogenous constituent.

Although the mode of combination of the carbohydrate with the rest of the molecule remains unexplained, the concept of carbohydrates as constituents of proteins must be considered in connection with theories of protein configuration. The application of similar technic to other proteins may aid in determining to what extent the carbohydrate components of physiologically important proteins determine their immunologic properties and biologic specificity.

Current Comment

A SKIN TEST FOR TOLERANCE TO ALCOHOL

About a year has passed since Nagle¹ proposed an endermic test for tolerance to alcohol. This test, developed in the state psychiatric clinic at Agnew, Calif., consists of an intracutaneous injection of 0.03 cc. of 60 per cent ethyl alcohol (U. S. P.) in the deltoid region with a control injection of the same volume of physiologic solution of sodium chloride in the opposite arm. A wheal about 9 mm. in diameter almost immediately forms, is common in all instances, and has no diagnostic significance. Surrounding the wheal a zone of erythema soon develops, varying in size and intensity in different persons. The maximum reaction is reached by the end of thirty minutes. In about 20 per cent of the 250 patients thus far tested by Nagle the surrounding erythema was of maximum intensity and about 3 inches (38 cm.) in diameter. These persons were classified by Nagle as ++++ intolerant or allergic to ethyl alcohol. At the other end of his arbitrary allergic scale about 10 per cent of his tested group failed to exhibit peripheral erythemic reaction to his arbitrary test dose. These he classified as belonging to the alcohol tolerant or alcohol immune group. Four intermediary groups are recognized on his arbitrary scale. From a study of the personal histories of these patients, supplemented by determinations of the minimum intoxicating dose of ingested alcohol with about fifty volunteers, Nagle concludes that the relative tolerance or susceptibility to ethyl alcohol as determined by the size and intensity of the skin reaction is a direct quantitative index of individual tolerance or susceptibility to ingested alcohol. Volunteers with negative skin reactions, for example, required in the neighborhood of 2½ ounces (75 cc.) of alcohol taken on an empty stomach before showing signs of intoxication. Only one-fourth ounce (7.5 cc.), or a tenth of this amount of ingested alcohol, is sufficient to cause demon-

strable speech defects in volunteers whose skin is ++++ allergic to injected alcohol. Skepticism has been expressed by immunologists² as to the logical basis for this alleged parallelism. It is interesting to note, however, that the percentage distribution of alcohol tolerance or susceptibility in the general population as determined by the Nagle skin test is approximately the same as the percentage distribution recently reported by German investigators³ as a result of quantitative blood analyses. Both sets of data show about 20 per cent of the population hypersensitive to alcoholic beverages and about 10 per cent relatively immune.

IMPORTATION OF RADIUM

Only a few hundred grams of radium has been produced since this element was first discovered in pitchblende by Pierre and Marie Curie in 1898. A large proportion has been used for therapeutic purposes. Although radium is also utilized extensively as an activating agent in the preparation of luminous paints and is employed by metallurgists to inspect flaws in metal castings, as much as nine tenths of the radium mined each year finds a use in medicine, particularly for the treatment of cancer. Many hospitals in the United States have accumulated sizable amounts of the metal. Last year it was reported that the combined radium stores of three institutions, Memorial Hospital in New York, Bellevue Hospital in the same city and the State Institute for the Study of Malignant Disease in Buffalo, amounted to almost an ounce. Almost no radium has been produced in the United States since 1923, when richer and larger deposits became productive elsewhere. After that year this country, although it is still the world's largest consumer, has met its needs by importation. In view of this circumstance the amount of radium imported is of interest particularly as it reflects the use of the metal in medicine. The imports of radium into the United States in 1938 established a new high record and the price paid was the lowest ever recorded, according to the Bureau of Foreign and Domestic Commerce.¹ The United States received from foreign countries a total of 598 grains of radium during 1938, compared with 236 grains imported in 1937 and 339 grains in 1934. The value of the imports in 1938 was \$787,000, or approximately \$1,316 per grain, compared with a valuation of \$377,000 for 1937 or \$1,600 per grain and \$1,082,500 in 1934 or about \$3,193 per grain. In 1929 the import invoice value of radium was approximately \$3,500 per grain. An important factor in the reduction of the price of radium was the discovery in Canada a few years ago of radium-bearing ore and subsequent exploitation of these deposits. The reduction in price has fortunately made radium more available. Although the field of the use of radium has been invaded by high voltage x-ray machines, the increasing intensity of the struggle against cancer has more than offset any tendency toward substitution; for internal radiation, in particular, radium therapy possesses unique advantages.

2. Manwaring, W. H., *ibid.*, p. 180.

3. Alcohol and Safe Driving, Berlin Letter, J. A. M. A. 110:1617 (May 7) 1938.

1. J. Indust. & Engin. Chem. 17:207 (March 20) 1939.

1. Nagle, J. M.: J. Allergy 10:179 (Jan.) 1939.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Society News.—The Calhoun County Medical Society was recently addressed, among others, by Drs. Howard R. Mahorner and Warren H. J. Hebert, both of New Orleans, on "Appendicitis and Its Complications" and "Strictures of the Rectum" respectively.

Personal.—Dr. George L. Gresham, Andalusia, was recently appointed chief physician at the Speigner State Prison.—Dr. Nathaniel G. Clark, Birmingham, has been appointed chief medical advisory officer of the department of correction and institutions of the state of Alabama, succeeding Dr. Henry G. Camp, Montgomery, resigned.

State Medical Election.—Dr. Mercer S. Davis, Dothan, was elected president of the Medical Association of the State of Alabama at its annual meeting in Montgomery April 20, succeeding Dr. Seale Harris, Birmingham. Other officers include Drs. John S. Tillman, Clio, and John Paul Jones, Camden, vice presidents of the southeastern and southwestern divisions respectively. Dr. Douglas L. Cannon, Montgomery, was reelected secretary. The association will meet in Birmingham in 1940.

CALIFORNIA

Personal.—Dr. Jacob M. Furstman, health officer of the Monrovia district, has been named administrative head of the Pomona health district.—Dr. Stacy R. Mettler, associate professor of medicine, University of California Medical School, San Francisco, is carrying on a six months' study on hematology and the leukemias at Oxford University, London, under the Nuffield Foundation.

Society News.—The San Francisco County Medical Society devoted its meeting May 9 to a panel discussion of peptic ulcer with the following speakers: Drs. William Dock, chairman; LeRoy H. Briggs, Julian M. Wolfsohn, Leo Henry Garland, Emile F. Holman and George K. Rhodes.—Dr. William D. Sansum, Santa Barbara, discussed "The Problem of the Underweight Patient" before the Hollywood Academy of Medicine April 13.—Dr. Hans Lissner, San Francisco, discussed "Recent Advances in Clinical Endocrinology" before the San Diego County Medical Society May 9.

CONNECTICUT

Dr. Cowdry Lectures at Yale.—Edmund V. Cowdry, Ph.D., professor of cytology, Washington University School of Medicine, St. Louis, will deliver the Woodward lecture at the Sterling Hall of Medicine, May 24, under the auspices of the department of anatomy, Yale University School of Medicine, New Haven. His subject will be "Problems of Ageing."

Grant for Child Research.—The General Education Board of the Rockefeller Foundation has made a grant-in-aid of \$85,000 to be distributed over a period of five years, and the Carnegie Corporation has appropriated the amount of \$10,000 a year for three years in support of the clinic of child development at the Yale University School of Medicine, New Haven. Under the direction of Dr. Arnold L. Gesell, New Haven, the clinic is continuing its systematic studies of the behavior of infants. A new program which these grants make possible will give special attention to the medical aspects and clinical applications of research in child development, it was announced.

Society News.—Dr. Louis S. Goodman, New Haven, addressed the Hartford County Medical Association April 4 on "Recent Developments in the Therapeutics of Pain."—The Middlesex County Medical Society was addressed in Cromwell April 13 by Dr. Lewis W. Brown, Newark, N. J., on "Allergy in General Practice" and George M. Dutcher, Ph.D., Middletown, "Since Horse and Buggy Days."—At a meeting of the New London County Medical Association, New London, April 6 Dr. Samuel J. Kopetzky, New York, discussed socialized medicine.—Dr. James Raglan Miller, Hartford, addressed the Tolland County Medical Association April 18 in Somers on office gynecology.

ILLINOIS

Personal.—Dr. Walter C. Earl, Cuernavaca, Morelos, Mexico, has been appointed director of the Champaign-Urbana health district, it was recently reported.—Dr. Julius B. Stokes has resigned as superintendent of the Livingston County Sanatorium, Pontiac, effective April 1.

State Medical Election.—Dr. James S. Templeton, Pinckneyville, was chosen president-elect of the Illinois State Medical Society at its annual meeting in Rockford May 4. Dr. James H. Hutton, Chicago, was inducted into the presidency. Dr. Joseph S. Lundholm, Rockford, was elected first vice president, and Dr. Harold M. Camp, Mounmouth, and Dr. A. J. Markley, Garden Prairie, were reelected secretary and treasurer respectively. The next annual meeting will be in Peoria.

Chicago

Dr. Taliaferro Made Distinguished Service Professor.—William H. Taliaferro, Ph.D., dean of the division of biological sciences and professor of parasitology, University of Chicago, was awarded the Eliakim H. Moore Distinguished Service Professorship May 4. Dr. Taliaferro received the award in recognition for his work in tropical diseases. The Moore professorship was established in 1927 in recognition of Dr. Moore, professor of mathematics at the university from 1896 to 1931.

Society News.—The Chicago Pathological Society was addressed at its annual meeting May 8, among others, by Drs. Edwin F. Hirsch and Russell H. Morgan on "The Causal Significance to Traumatic Ossification of the Fibrocartilage in Tendon Insertions."—At a meeting of the Chicago Ophthalmological Society May 8, the speakers were Drs. Harry S. Gradle and Daniel Snyder on "Report of Three Cases of Retinal Detachment Occurring in Glaucoma"; Arthur Weil and Leo L. Mayer, "Attempts to Produce Experimental Tumors of the Eyeball," and Stephan van Wien, "The Leland Refractor: A Method for Refraction Under Binocular Conditions."—Dr. Albert Graeme Mitchell, Cincinnati, will speak on "What I Don't Know About Endocrines" before the Chicago Pediatric Society May 23.

IOWA

Annual Renewal Fees Due Before June 1.—All licenses to practice medicine and surgery in Iowa expire annually on June 30. To renew such a license a licensee must make a written application to the state department of health before June 1, enclosing the renewal fee of \$1. If a license expires by reason of the licensee's failure to renew it, it can be reinstated without reexamination only on the recommendation of the state department of health and the payment of the overdue fees.

KANSAS

Library for Sedgwick County.—At a meeting of the Sedgwick County Medical Society, Wichita, February 7, the members voted unanimously to establish a medical library. New quarters taken by the society will provide space for the library reading room, the executive secretary's office, the medical service bureau office and a large reception room allowing space for library shelves. A librarian will be employed to catalogue and index material and assist in reference work, according to the *Medical Bulletin*.

MICHIGAN

University News.—A grant of \$2,000 from Parke Davis & Co. will provide for a year's research at the Wayne University College of Medicine into the cause and treatment of peptic ulcer. Dr. David Sandweiss, instructor in clinical medicine, and M. H. F. Friedman, Ph.D., research associate in physiology, with rank of instructor, will be in direct charge of the work, while Thomas L. Patterson, Ph.D., will supervise the research. General investigations of peptic ulcer conducted during the past two years by the department of surgery will be continued in collaboration with the new work.

Personal.—Dr. Alexander W. Blain, Detroit, formerly president of the Wayne County Medical Society, has been appointed to the state commission of conservation.—Governor Dickinson has appointed Dr. Henry Allen Moyer, Charlotte, his personal physician, to the state service in the capacity of medical secretary, it was reported.—Dr. Charles R. Smith, formerly on the staff of the William H. Maybury Sanatorium, Northville, has been appointed medical superintendent of the Cooper Country Sanatorium, Houghton, succeeding Dr. George

McL. Waldie, resigned.—The library of the late Dr. Stephen H. Knight, Detroit, has been donated to the Wayne County Medical Society by his son Rufus.

Outbreak of Smallpox.—Newspapers reported April 12 that sixteen basketball teams were involved in an outbreak of smallpox while playing in a tournament in Mount Pleasant recently. The sixteen competing teams represented schools at Flushing, Alma, Sandusky, Evart, Perrinton, Gladwin, Lake City, West Branch, Carson City, Mecosta, Alabaster, Roscommon, Weidman, Crystal, Fowler and Mount Pleasant. In addition to the areas threatened by outbreaks directly related to the Mount Pleasant tournament, many other counties have been reporting smallpox cases, it was reported. Up to April 12, 192 cases had been reported throughout the state, constituting one of the greatest smallpox threats in recent years. For one month prior to this report seventeen counties reported seventy-one cases; these counties included Roscommon, Gratiot, Mecosta, Montcalm, Osceola, Muskegon, Allegan, Isabella, Cass, Genesee, Gladwin, Hillsdale, Midland, Missaukee, Ottawa, Presque Isle and Shiawassee. The state department of health secured six graduate physicians from the University of Michigan School of Hygiene and Public Health to assist local authorities in those counties having no full time health departments, it was stated.

MINNESOTA

Personal.—Dr. Gerald Taylor Evans, assistant professor of physiological chemistry, Yale University, New Haven, Conn., has been appointed associate professor of medicine and director of chemical and metabolic laboratories at the University Hospital, University of Minnesota. Dr. Evans graduated at McGill University Faculty of Medicine, Montreal, in 1932; he received his degree of doctor of philosophy from the University of Pennsylvania in 1937.

Society News.—Dr. Jesse G. M. Bullowa, New York, delivered the annual address before the Minnesota Pathological Society April 18 on "Specific Treatment of the Pneumococcus Pneumonias." The society was recently addressed by Drs. James S. McCartney, Minneapolis, on "Relation of Age and Site of Operation to Postoperative Pulmonary Embolism" and Fred G. Kolouch, Schuyler, Neb., "Role of the Lymphocytes in Acute Inflammation."—Recent meetings of the Scott-Carver County Medical Society were addressed in Shakopee and Minneapolis respectively by Drs. Edgar W. Bedford, Minneapolis, on "Clinical Aspects of Gallbladder Disease"; Ames W. Naslund, St. Paul, on "X-Ray Diagnosis in Gallbladder Disease"; Carl O. Rice, Minneapolis, "Indications for Surgery of the Thyroid Gland" and Chauncey N. Borman, Minneapolis, "X-Ray Measurements of the Female Pelvis."—Dr. Kenneth A. Phelps, Minneapolis, presented a paper before the Minnesota Academy of Medicine, St. Paul, April 12 entitled "Early Cancer of the Larynx."

MISSOURI

Society News.—Dr. Harold E. Petersen, St. Joseph, discussed pyelitis before the Buchanan County Medical Society recently.—The St. Louis Medical Society held a round table discussion on arthritis April 21 with Dr. Ralph A. Kinsella as the leader; one on delayed operation in acute peritonitis following ruptured appendicitis was held May 5 with Dr. Robert Elman as the leader.

Medal to Dr. Jacobsen.—Carlyle F. Jacobsen, Ph.D., professor of medical psychology, Washington University School of Medicine, St. Louis, was presented with the Howard Crosby Warren Medal at the annual dinner of the Society of Experimental Psychologists in Princeton, N. J., April 2. According to the New York Times, the medal was awarded for Dr. Jacobsen's "Description of the Functions of the Frontal Lobes of the Brain."

Personal.—Dr. William F. McCarthy has been appointed health officer of Jackson County, according to the *Weekly Bulletin* of the Jackson County Medical Society. Dr. McCarthy is attending the Graduate School of Public Health Administration of the University of Michigan, Ann Arbor.—Dr. Felix Deutsch, a member of the faculty of the University of Vienna from 1919 to 1935, has been made associate professor of psychosomatic medicine at the Washington University School of Medicine, St. Louis.

Health Department to Reorganize.—Full authority was given to Dr. Edwin H. Schorer, director of the Kansas City Health Department, April 27, "to clean out politics from the city health department," according to the Kansas City *Star*.

Mayor Smith at the same time recognized the leadership of the Jackson County Medical Society in any move to revamp the health department. He asked Dr. Schorer to assemble a committee of doctors from the society at once to work with the health director "in reorganizing the health department 'along efficient lines and with no political strings attached—none whatsoever.'"

NEW JERSEY

New Officers of State Medical Board.—New appointments to the New Jersey State Board of Medical Examiners include those of Dr. Samuel Barbash, Atlantic City, A. Stanley Myers, D.C., Jersey City, and Dr. John H. Rowland, New Brunswick, succeeding Dr. Henry B. Diverty, Woodbury, Walter Seth Kipnis, Ph.D., West New York, and the late Dr. William E. Darnall, Atlantic City.

NEW YORK

State Medical Election.—Dr. James H. Borrell, Buffalo, was chosen president-elect of the Medical Society of the State of New York at its annual meeting in Syracuse April 25, and Dr. Terry M. Townsend, New York, was installed as president. Other officers include Drs. Aaron Sobel, Poughkeepsie, second vice president, and Peter Irving, New York, secretary. The 1940 annual session will be held in Buffalo.

Hospital Named in Honor of Physician.—Dedication ceremonies were held April 20 to mark the renaming of the Buffalo City Hospital as the Edward J. Meyer Memorial Hospital. The late Dr. Meyer was for many years president of the hospital board. Kenneth Goodner, Ph.D., of the Rockefeller Institute for Medical Research, New York, was the guest speaker, discussing newer aspects of pneumonia. Other speakers included Drs. Carlton E. Wertz, who reviewed the life of Dr. Meyer; Dr. Abraham H. Aaron on the relationship between the hospital and the University of Buffalo; Chancellor Samuel P. Capen of the university, Dr. Herbert H. Bauckus and Commissioner Thomas W. H. Jeacock of the county department of social welfare. The ceremonies were under the auspices of the Medical Society of the County of Erie, the Buffalo Academy of Medicine and the consulting, visiting and resident staffs of the hospital.

New York City

Eighth Harvey Lecture.—Dr. Albert Szent-Gyorgyi, professor of medical chemistry, University of Szeged, Hungary, delivered the eighth Harvey Lecture of the current series at the New York Academy of Medicine May 18. His subject was "Biological Oxidation and Vitamins."

Goat's Milk.—About 150 milch goats are supplying the demand for goat's milk in the city, according to New York *Medical Week*. The three dairies furnishing the milk operate under a permit from the city department of health. Although goat's milk is popular in Europe, only approximately 250 quarts of it are consumed in the city every day, it was stated. Each of the three goat dairies produces certified milk, and one of them also produced pasteurized milk.

Retiring Members of Rockefeller Staff.—Five members of the Rockefeller Institute for Medical Research are retiring from active work, having reached or passed the age of 65 years. They are Drs. Alexis Carrel, who announced his retirement last year, Florence R. Sabin, who retired early this year; Karl Landsteiner, Phoebus A. Levene and Winthrop J. V. Osterhout, Ph.D. According to *Science*, the mandatory retirement rule is being enforced in all organizations with which the Rockefeller foundations are connected. It is stated that pensions will be given and that every laboratory facility will be provided to enable those who retire to continue their research work on their own responsibility if they care to do so.

Exhibit Presented to Army Museum.—The anatomical collection assembled by the late Dr. George Sumner Huntington, for many years professor of anatomy at Columbia University College of Physicians and Surgeons, has been presented by the medical school to the Army Medical Museum, Washington, D. C. This is said to be the largest collection in the United States and was formerly used in teaching. When the medical school was in its old location at Fifty-Ninth Street, the collection was viewed by many visitors, but in recent years lack of space at the new Medical Center has made an exhibit impossible, it was said. For this reason it was decided to transfer it to the Army museum, where it will be available for students from all parts of the world.

Society News.—At a joint meeting of the Medical Society of the County of Kings and Academy of Medicine of Brooklyn, April 18, Murray J. Shear, Ph.D., and Dr. Stanley P. Reimann, Philadelphia, discussed "Experimental Aspects of Carcinogenic Substances" and tumor grading, respectively. The Brooklyn Thoracic Society was addressed April 21 by Drs. Edgar Mayer on diagnosis of early pulmonary tuberculosis and Paul Geary, "The Operation of Extrapleural Pneumothorax."—A symposium on the treatment of peripheral vascular disease was presented at a meeting of the New York Academy of Medicine May 4 by Drs. Irving Sherwood Wright, Edgar V. Allen, Rochester, Minn., and Reginald H. Smithwick, Boston. Drs. James C. White, Boston, and Beverly Chew Smith discussed the papers.—Dr. Smiley Blanton, among others, addressed the New York Neurological Society at a joint meeting with the section of neurology and psychiatry May 2 on "Psychiatric Study of Some Miraculous Cures at Lourdes."

NORTH CAROLINA

Plaque in Honor of Dr. McBrayer.—A plaque was unveiled April 19 in the auditorium of the state tuberculosis sanatorium, Sanatorium, in honor of the late Dr. Louis B. McBrayer. Dr. Paul H. Ringer, Asheville, was the principal speaker. Dr. McBrayer served for twenty-one years as secretary of the Medical Society of the State of North Carolina and at one time as president; he was president of the Southern Conference on Tuberculosis 1925-1926, managing director of the North Carolina Tuberculosis Association, 1915-1937, and superintendent of the state tuberculosis sanatorium at Sanatorium, 1914-1924.

OHIO

Dr. Krogh Gives Hanna Lecture.—Dr. August Krogh, professor and director of the Zoophysiological Laboratory, University of Copenhagen, Denmark, delivered the forty-fourth Hanna Lecture at the Institute of Pathology, Cleveland, May 5. His subject was "The Regulation of the Circulation as Observed in Changes of Posture in Man."

Director of Social Hygiene Society Appointed.—Dr. Richard W. Weiser, medical director of public schools in Kenmore, N. Y., has been appointed executive secretary of the Cincinnati Social Hygiene Society to succeed Dr. Carl A. Wilzbach, who recently became city health commissioner. Dr. Weiser received his medical degree at the University of Pennsylvania School of Medicine, Philadelphia, in 1927. He has been with the Kenmore school system for six years.

Society News.—Dr. Charles E. Kiely, Cincinnati, among others, addressed the Adams County Medical Society April 19 in West Union on "Dementia Praecox and Its Treatment."—Drs. Frederick G. Maurer and Melvin A. Mulvania, Lima, addressed the Henry County Medical Society April 11 in Napoleon on "Clinical Aspects of the Common Cardiac Arrhythmias" and "Hemorrhage in Pregnancy" respectively.—Dr. John A. Malcolm, Pittsburgh, addressed the Columbiana County Medical Society in Lisbon April 11 on "Neurasthenia and Recent Advances in Neurology."

PENNSYLVANIA

Society News.—Drs. Russell L. Haden and James A. Dickson, Cleveland, discussed medical and surgical aspects, respectively, of arthritis at a meeting of the Westmoreland County Medical Society April 27 at the Mountain View Hotel near Greensburg.—Dr. John A. Kolmer, Philadelphia, addressed the Blair County Medical Society, Altoona, April 25, on "Immunology of Anterior Poliomyelitis."—Dr. Joseph A. Hepp, Pittsburgh, addressed the Fayette County Medical Society in Uniontown May 4 on "Endocrine Treatment of Menstrual Disorders."

Philadelphia

Portrait Presented.—The senior class of Jefferson Medical College presented a portrait of Dr. Frank Crozer Knowles, professor of dermatology, to the college April 28. The portrait was painted by Frederick Gill, Philadelphia artist. Dr. Knowles, who graduated from the University of Pennsylvania in 1902, has been professor of dermatology at Jefferson since 1919.

Course in Internal Medicine.—The Pennsylvania Hospital announces a general course in internal medicine for graduate physicians to be given June 5-23. Lecturers will be Drs.

William D. Stroud, on cardiology; Lawrence S. Carey, gastroenterology; David L. Farley, hematology; Burgess L. Gordon, diseases of the lung; Norman P. Shumway, diseases of the kidney; Garfield G. Duncan, metabolism; John T. Bauer will conduct pathologic conferences and Paul A. Bishop, roentgen ray conferences. The fee is \$100.

WEST VIRGINIA

Interstate Meeting.—The Greenbrier Interstate Medical and Surgical Society held its first meeting at the Greenbrier Hotel, White Sulphur Springs, April 17. The speakers were Drs. Marvin Pierce Rucker, Richmond, on "Further Experience with Knotless Sutures in Immediate Perineorrhaphy"; John M. T. Finney Jr., Baltimore, "Developments in the Study and Care of Patients Suffering with Appendicitis," and Louis George Herrmann, "Practical Aspects of Circulatory Disturbances in Extremities." This meeting was the first of neighboring medical societies in Virginia and West Virginia.

WYOMING

Lectures on Pediatrics.—A series of postgraduate lectures on pediatrics will be presented throughout Wyoming May 22-June 9 by Dr. Clifford D. Sweet, chief of staff at the Children's Hospital of the East Bay, Oakland. The series is part of a plan for postgraduate work for Wyoming physicians in obstetrics and pediatrics, approved at the annual meeting of the Wyoming State Medical Society in August 1938.

GENERAL

Prize Awarded for Pellagra Cure.—Conrad Arnold Elvehjem, Ph.D., since 1936 professor of agricultural chemistry, University of Wisconsin, Madison, was awarded a prize of \$1,000 at the closing meeting of the American Institute of Nutrition in Toronto April 26 for his discovery that nicotinic acid would cure pellagra. Dr. Elvehjem was born in McFarland, Wis., in 1901.

Meeting of Surgeons.—The third annual assembly of the International College of Surgeons will be held at the Hotel Roosevelt, New York, May 21-25. The program includes many speakers from the United States and other countries. At the banquet, Tuesday evening, the speakers will include Gen. Dr. F. C. Najera, ambassador from Mexico to the United States, Major Vovrier, and Dr. Max Thorek, Chicago.

Rheumatism and Arthritis.—An editorial committee of the American Rheumatism Association, headed by Dr. Philip S. Hench, Mayo Clinic, Rochester, Minn., has published the fifth rheumatism review of American and English literature on "rheumatism." This review assembles in one place most of the references on the subject and contains numerous editorial and critical comments by its compilers. The review appeared in the January and February issues of the *Annals of Internal Medicine* and is also available in reprint form from the secretary of the American Rheumatism Association, Dr. Loring T. Swain, Boston.

Society News.—The eleventh annual meeting of the Aero Medical Association will be held at the Hollywood Beach Hotel, Miami, November 3-5.—The twenty-second annual meeting of the American Dietetic Association will be held at the Hotel Ambassador in Los Angeles August 27-31; the speakers will include Agnes Faye Morgan, Ph.D., University of California, on "The Dietitian's Place in the Hospital Research Program"; E. Neige Todhunter, Ph.D., State College of Washington, "The Newer Knowledge of Vitamin C in Health and Diseases," and Dr. Albert H. Rowe, Oakland, "Allergy."—The American Society of X-Ray Technicians will hold its fourteenth annual meeting at the McAlpin Hotel, New York, June 27-30.

Special Society Elections.—Mr. John O. Steel, Pine Bluff, Ark., was installed as president of the Mid-West Hospital Association at its annual meeting in Hot Springs National Park. Dr. Herbert A. Black, Pueblo, Colo., was chosen president-elect. The association includes the states of Arkansas, Colorado, Kansas, Missouri and Oklahoma.—Frank B. Jewett, Ph.D., president, Bell Telephone Laboratories, New York, was elected president of the National Academy of Sciences at its annual meeting in Washington April 26, succeeding Frank R. Lillie, Ph.D., Chicago. Frederick E. Wright, Ph.D., of the geophysical laboratory of the Carnegie Institution,

tion, Washington, was reelected home secretary.—Dr. Fred Kuhlman, St. Paul, Minn., was elected president of the American Association on Mental Deficiency at its annual meeting at the Palmer House May 6. Other officers include Meta A. Post, Ph.D., Newark, N. J., vice president, and Dr. E. Arthur Whitney, Elwyn, Pa., secretary-treasurer. The 1940 meeting will be held in May in Atlantic City.

Research on Problems of Alcohol.—The recently organized Research Council on Problems of Alcohol has issued a report outlining its program of research as it has been developed at present. It will be the policy of the council to conduct research, to arrive at conclusions based on research, to present the facts in suitable form to interested groups and to encourage intelligent discussion of the facts, according to the statement. It will not arrive at conclusions based on unscientific assumptions, engage in propaganda, lobby for liquor control laws or participate in political campaigns. The following problems have been selected for study and some of them assigned as indicated:

A critical survey of the conclusions to date of all significant studies regarding the effects of alcohol on the individual

Polynuritis and Korsakoff's psychosis in the alcohol addict, to be conducted by Bellevue Hospital, New York

Toxic factors in alcoholism, to be conducted by the New York Psychiatric Institute

A critical survey of all studies completed and under way which deal with the relation of alcohol to traffic accidents.

The role of alcohol in liver cirrhosis, to be conducted by Bellevue Hospital

Psychological factors in deterioration and recovery in cases of acute alcoholism and alcoholic psychosis

Research will be conducted in three fields: the effects of alcohol on the individual, the effects of alcohol on society and the effectiveness of industrial and legal control. Accompanying the research program will be a program of education in four fields; schools and colleges, community leaders and the adult population, manufacturers and distributors of alcoholic beverages, law enactment and law enforcement agencies. Harry H. Moore, Ph.D., is director of the council, which has headquarters in the R. C. A. Building, New York.

Osteopathy Vetoed in New York.—On May 10, Governor Herbert H. Lehman of New York vetoed a bill which would have permitted licensed osteopaths to use instruments for minor surgical work, as well as use anesthetics, antiseptics, narcotics and biologic products. In a message explaining his action, the governor wrote:

To the Assembly

There has been great misunderstanding with regard to this bill. Many people apparently believe that the practice of osteopathy as now carried on depends on my approval of the bill. This, of course, is completely contrary to the fact.

Any persons now licensed or hereafter licensed as doctors of osteopathy are, regardless of my action on the bill, permitted to render exactly the same services as in the past. Their authority to carry on the functions now performed is in no way curtailed or abridged.

VALUE OF OSTEOPATHY CONCEDED

There is no question as to the substantial value and usefulness of osteopathy. This is generally conceded and recognized. This bill would, however, give all licensed osteopaths broad additional powers. It would permit all licensed osteopaths to use instruments for minor surgical procedures, to administer anesthetics and antiseptics, and to prescribe narcotics and biological products.

The additional authority now asked by the osteopaths may be far-reaching in its effect. A minor operation, if not properly performed, I am advised, may be more serious in its effect upon the patient than some of the so-called important operations.

The administering of drugs and biologicals where there is not sufficient training and experience with regard to their effect on the patients may lead to serious ill effects.

Undoubtedly many of the persons now licensed to practice osteopathy in this State have had broad training and experience in matters relating to medicine and surgery. On the other hand, many of the osteopaths practicing in this State were licensed prior to the setting of the present high standards of training and have had little or no later experience in medicine or surgery.

LICENSING METHODS RECALLED

In addition, a very substantial number of the osteopaths now practicing in this State receive their licenses not through examinations within the State but by endorsement of licenses granted to them in other States. Some of them are graduates of osteopathic schools which are no longer recognized by our board.

In my opinion legislation should provide that applicants for licenses and those who already hold licenses as osteopaths but who now desire additional powers should be required to satisfy the Board of Regents either by submitted credentials or by examination that they have had the proper instruction and training in surgical procedure and drug therapy to justify the granting of the additional powers set forth in this bill.

In this way the Regents would be able to determine those who are actually qualified to use instruments for minor surgical procedures, to administer anesthetics and antiseptics and to prescribe narcotics and biological products. The difficulty of providing for such determination by the Board of Regents does not seem to me great.

The bill is disapproved

HERBERT H. LEHMAN.

CANADA

Society News.—Dr. Ralph M. Waters, Madison, Wis., addressed the Academy of Medicine of Toronto April 4 on "The Development of Anesthesiology." Dr. Joseph Brenne-mann, Chicago, addressed the academy recently on "Acute Abdominal Conditions in Childhood." Dr. Eric Miles Atkinson, New York, addressed a combined meeting of the sections on otolaryngology and neurology and psychiatry recently on "Localized Nonsuppurative Encephalitis Resulting from an Adjacent Focus of Infection—Some Pathological and Clinical Considerations."—Dr. John H. MacDermot, Vancouver, delivered the annual Osler Lecture of the Vancouver Medical Association March 7 on "The Layman and the Doctors."

Summer School Clinics.—The Vancouver Medical Association will hold its annual summer school clinics June 6-9; participants will include:

Dr. Leighton C. Conn, professor of obstetrics and gynecology, University of Alberta Faculty of Medicine, Edmonton.

Dr. Emile F. Holman, professor of surgery, Stanford University School of Medicine, San Francisco.

Dr. Charles P. L. Mathe, San Francisco.

Dr. Frank R. Menne, professor of pathology, University of Oregon Medical School, Portland.

Dr. Dwight L. Wilbur, associate clinical professor of medicine, Stanford University School of Medicine, San Francisco.

Further information may be obtained from Dr. William W. Simpson, secretary, 203 Medical-Dental Building, Vancouver, B. C.

Medical Research Facilities in Canada.—The National Research Council of Canada recently made a survey of medical research facilities in the Dominion. A conclusion was reached that immediate attention should be given to tuberculosis and rheumatic diseases. Projects are to be initiated in a number of institutions. In the field of cancer research the committee decided to aid the work on standardization of dosage which has been undertaken in cooperation with the National Physical Laboratory in England and the National Bureau of Standards in Washington, D. C., making use of high voltage equipment in the National Research Laboratories at Ottawa. The committee also proposed to aid in developing research in various institutions throughout Canada, and these institutions have been invited to undertake work under the auspices of the committee of which Sir Frederick Banting, Toronto, is chairman.

FOREIGN

Congress on Medical Hydrology.—The sixteenth International Congress on Medical Hydrology, Climatology and Geology will be held at the Strasbourg Faculty of Medicine October 8-11. Information may be obtained from M. le Prof. Vaucher, Institut d'Hydrologie et de Climatologie, 1 place de l'Hôpital, Strasbourg.

Societies Merge to Form Faculty of Radiologists.—The British Association of Radiologists and the Society of Radiotherapists of Great Britain have joined to form the Faculty of Radiologists, according to *Radiology*. The work of the new organization will be carried on at the old office of the British Association of Radiologists, 32 Welbeck Street, London, W.1.

Society News.—The National Association for the Prevention of Tuberculosis of Great Britain will be held in Belfast, Ireland, June 29 to July 1. The subjects for discussion will be "Problems of Organization and Local Administration of Tuberculosis Schemes"; "Tuberculosis in the Adolescent" and "Architectural Problems in Connection with Tuberculosis Institutions."—The German Roentgen Society will hold its annual meeting in Stuttgart May 24-27.

Congress on Industrial Medicine.—The second "Journées Internationales de Pathologie et d'Organisation du Travail" is to be held in Paris under the patronage of government officials and with the cooperation of various medical and industrial organizations. The program lists the following subjects of reports to be presented: "Hygienic Conditions in Soldering Works"; "Etiology and Pathogenesis of Occupational Dermatitis"; "Various Systems of Compensation for Occupational Disease" and "Toxicologic Study of the Principal Constituents of Special Kinds of Steel." There will be many visits to industrial plants and to hospitals. The languages of the congress will be German, English, Spanish, French and Italian. All correspondence should be addressed to the president of the congress at the Institut Medico-Legal, Place Mazas, Paris XII. Dr. Guy Hausser is the secretary in charge of organizing the congress.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 22, 1939.

Thomas's Splint in War Surgery

In lectures on the treatment of war wounds, delivered at the British Postgraduate Medical School, Col. J. M. Weddell of the Army Medical Corps stated that the army relied on the large-ringed Thomas splint in the evacuation of the majority of fracture patients from the front line to the casualty clearing station. The splint is applied over the boot and clothing, and the ring is packed anteriorly and laterally with tow or wool to retain it against the tuber ischii. The fracture is supported with Gooch splinting or Cramer's wire. Extension is obtained by means of a skewer through the waist of the boot or a clove-hitch, around the ankle, tied to the distal end of the splint. The splint is suspended to a bar fitting over the stretcher. Many modifications of Thomas's splint have been suggested, such as collapsible splints and half-ringed splints. Colonel Weddell had the opportunity of discussing a number of points with a committee composed of four members of the council of the Royal College of Surgeons. It was agreed that for the evacuation of casualties the original Thomas model was the most satisfactory. As one member said, "A Thomas splint altered is a Thomas splint spoiled."

It was agreed that internal traction by pins and wires was unsafe unless first class asepsis could be assured. Thus skeletal traction in dressing stations was ruled out and probably also in casualty clearing stations from which patients are evacuated by train. Plaster of paris in the form of supporting slabs would be of great use in casualty clearing stations, but encircling compound fractures with circular plaster bandages was dangerous in the early stages. Extensive use should be made of blood transfusions, and blood stored in refrigerators should be used in dressing stations. Drip transfusion would be of great use in casualty clearing stations. Advanced operating units were not advised, as it would be better to get the patients to the casualty clearing stations, where they could be operated on and nursed under better conditions. Patients would not stand evacuation well after serious operations. Gas and oxygen was the best anesthetic for serious operations, but it involved the use of heavy, cumbersome cylinders, to supply which might be difficult. For many operations ether should be the standard anesthetic. Barbiturates and spinal anesthesia were dangerous for patients already in a condition of shock.

In the great war the introduction by Sir Robert Jones of the use of Thomas's splint for the transport of patients with gunshot fractures of the femur greatly reduced the mortality from these fractures. The observation made that Thomas's splints are so perfect that attempts to improve them have only the opposite effect is not new. The passage of time has only increased Thomas's reputation, while it almost uniformly dims the reputation of men famous in their day. During his life Thomas received little recognition. When the American orthopedist John Ridlon visited the English clinics he found that the surgeons did not have a good word for Thomas, but of him he wrote the great epitaph "He did more good new things for orthopedics than all the rest since Hippocrates."

Prolapsed Intervertebral Disk

At the Royal Society of Medicine Dr. J. Grafton Love of the Mayo Clinic opened a discussion of prolapsed intervertebral disk. The typical finding at operation was edema of the posterior nerve root in the affected segment. The prolapse was relatively uncommon, though Dr. Love was able to give statistics of 300 cases. It was three times commoner in men than in women and the average age at the time of operation was

40 years, but this was no true indication of the age of onset of symptoms, of which there was a long history in many cases. The greatest incidence was in the lumbar region, the fourth and fifth disks being those liable to be affected, thus accounting for the dominant symptom, sciatica. Thirty-seven per cent of the patients gave a history of injury immediately preceding the onset of symptoms. Nocturnal pain was an important symptom, as were exacerbations on coughing and sneezing. The achilles jerk was absent. Examination showed spasm of the erector spinae and obliteration of the lumbar curve. The total protein in the cerebrospinal fluid was increased, and in two thirds of the cases radiographic examination with iodized oil revealed narrowing of the canal. The treatment was laminectomy with removal of the protruding cartilage, which gave gratifying results.

The neurologist Dr. C. P. Symonds had experience of twenty-two cases, in which the pressure was on the cord in fifteen and on the cauda equina in seven. He discussed the differential diagnosis from other conditions, such as tumors. Important features were the relation of the pain to injury and its exacerbation by coughing and spinal movements. Remission of symptoms was noteworthy. Patients in whom the lumbar part of the spine was affected showed pain in the lower part of the back, related to effort and posture. Elsberg had stated that the posterior columns were spared in the sensory loss that might ensue, but Symonds had found that this did not hold in seven of his cases. Spinal tumors were distinguished by the fact that on the whole the sequence of events suggested anterior compression, while prolapsed disk caused posterior compression. Disseminated sclerosis, with its well known remission of symptoms, might give rise to difficulty of differential diagnosis. The question of sciatica presented difficulty, for his experience of sciatica was that patients eventually recovered, whatever the treatment. How many sciatic patients with prolapsed disk recovered with rest alone before the days of diagnosis of the cause?

Mr. Julian Taylor said that three types of pain were caused by prolapsed disk: (1) pain in the vertebrae, (2) pain referred from the vertebrae and (3) pain referred from the nerve pinched. The last was the most persistent. From his operative experience he rejected the theory of hernia of the nucleus pulposus. The substance removed was white necrotic material. One of his patients, a heavy man, hurt his back in a turn with professional acrobats. They threw him in the air and caught him at their feet. Extreme kyphosis developed.

Evacuation of the London School Children

If the latest development of "civilized warfare," the bombing of crowded cities, should occur in this country, it has been arranged to spare children as far as possible. Plans complete to the last detail for the stupendous task of evacuating the school children of London have been issued to the heads of the schools in a circular of 5,000 words. As many as 1,300,000 children and the persons accompanying them will need to be moved out in organized parties in a short time. The children will be accompanied by their teachers and when under 5 years by their mothers or other responsible persons. Blind persons and expectant mothers will be removed at the same time. The government has made a survey of the accommodations available in the reception areas, which shows that there will be no scarcity of homes where the householders are willing to look after the children. In an emergency two messages will be sent to the schools. When the first, "Get ready for evacuation," is received head teachers will notify all assistant teachers and helpers. The second message will give the date of evacuation, and each school will then form a unit or school party. The children will march to the train in squads of fifty. Divisional officers have been appointed for the quick settlement of local problems. They will be responsible for the local planning of routes to the

entraining stations and arranging the order in which schools will be entrained. The children will carry a change of clothing, night attire, toilet requisites, sufficient food for the day and their gas masks. It will not be possible to take at the same time children who are sick at home or who are so crippled that they cannot walk.

PARIS

(From a Special Correspondent)

April 15, 1939.

Alcoholism

It is estimated that the annual expenditure by the French on their apéritifs and small drinks is 6 billion francs. A committee of the Académie de médecine has been charged to formulate recommendations and to submit to the public authorities the resolutions that sociologists, biologists and physicians regard as indispensable. Strict enforcement of existing laws is demanded, especially those which concern the number of drinking shops and the hours during which alcohol may be sold. Moreover, an important reduction of their number and their closing under certain circumstances such as strikes and elections are asked. These representations allow one to understand the role that politics plays in the spread of alcoholism.

The Société médicale des hôpitaux of Lyons insists on the prohibition of drinks of high alcoholic content and the sale of alcohol in glasses. It believes that tax reductions should be allowed drink shops that do not sell alcohol, that habitual drunkards should be denied permits to manage such places and the benefit of insurance protection and that drunkenness should no longer be regarded as an attenuating circumstance by courts; in short, that an intensive campaign should be undertaken against this social danger.

The French Population

France had 36,000,000 inhabitants in 1850. She has 42,000,000 today, but one must deduct 2,500,000 aliens. In 1850 there were only 400,000 aliens. Italy, England and Germany have doubled their population while France has grown by only one tenth. In 1851 three Frenchmen lived in the country to one in the city. Today more people live in the city than in the country and one eighth of the French population lives in Paris and its outskirts.

This exodus from country to town coincided with the lowering of the birth rate. Although the number of marriages remains stationary, that of children per marriage is rapidly falling. The difficulty is that French women either no longer can or no longer want to bear children. German family life faced the same situation for twenty-five years, until Hitler ordered economic measures, which have fully succeeded. At present German families in which the mother's age ranges from 20 to 24 years have twice as many living children as French families in similar situations.

The remedies proposed by Moine, who presented extensive evidence of this situation before the Académie de médecine, aim at establishing an economic and financial equilibrium between large families, homes without children and single men and women, since half of the French homes entrust to the others the care of maintaining the population level. It is not a question of penalties but solely of establishing a reasonable balance between those who rear children and those who do not.

Vitamins in the Prevention of Pellagra

The pathogenesis of aphthae is unknown. Professor Cachera at a reunion of the Société médicale des hôpitaux of Paris reported satisfactory results from the administration of nicotinic amines and nicotinic acid in the treatment of this disease. Cure took place in a few days in several cases in which the condition had been refractory to other treatments. The speaker

wondered whether aphthae is an atypical form of pellagra. It is possible that the satisfactory results induced by administering liver extract in the treatment of aphthae may be due to the nicotinic acid amines present in the extract. Boule reported satisfactory results from the administration of nicotinic acid in a case of coproporphyrinuria. The patient was suffering from cirrhosis without ascites, hepatic insufficiency, local melanoderma, cerebral symptoms and colic spasm. Nicotinic acid induces rapid improvement of the general condition of the patient and rapid disappearance of porphyria. This case suggests a possible connection between aphthae and pellagra in their relation to avitaminosis.

Electrofluoroscopy

Lian and Minot presented at the Société médicale des hôpitaux of Paris a fluoroscopic electrocardiograph which solves the difficulty of taking a film through the photographic tray and waiting for the negative before seeing how the heart functions. This apparatus makes it possible to see electrocardiograms and electrokymograms instantaneously. There remain some distortions to suppress, caused by the powerful amplifier used for transmission.

Lian and Minot used a cylindric screen, moved at uniform speed, in front of the oscillograph. Besides, the use of a mechanical oscillator, instead of a cathodic oscillograph, permits the use of an amplifier of small power. The recording consequently is continuous and regular and the period of phosphorescence long enough for observation. The apparatus consists of a large cylinder, its evolution measuring 1 meter, with the time marked on it. This cylinder turns in front of the luminous spot or spots and thus are made the electrocardiographic and kymographic tracings. The frequencies and amplitudes are faithfully reproduced. An interesting phase of the tracing may be preserved either by diverting the current toward the regular electrocardiogram or else by placing a piece of sensitized paper over the place of interest on the screen; the remaining light will be strong enough to leave an impression of the image on the emulsion.

The apparatus is simple and inexpensive. Its uses are manifold. It is possible to get an electrocardiogram for guidance in diagnosing at the bedside of the patient and to follow on the fluorescent screen the immediate effects of a medicament or to keep a patient during narcosis or childbirth under constant control. It may be most useful for psychologic experiments; the encephalographic tracing is drawn at will before the eye of the experimenter.

Anniversary of the Pasteur Institute

At the fiftieth anniversary of the founding of the Pasteur Institute most of the speakers preferred to arrange a program in which the students and former associates of Pasteur exhibited the results of their activity. Among these, Prof. M. L. Martin, present director of the institute, described Pasteur's methods and techniques, in which he had been a direct collaborator. Prof. Gaston Ramon gave a summary of a fifty year old achievement of Pasteur, the fight against diphtheria. This was an occasion to defend anatoxin against recent attacks. Prof. Pasteur Valléry-Radot concluded the commemoration by reviewing the activity of Pasteur institutes in the struggle against social scourges, not only in French colonies but in many other countries.

Spanish Refugees

After Franco's victory, 200,000 Republican soldiers, of whom 12,000 were wounded, and 160,000 civilians took refuge in France, crossing the Pyrenees by eastern mountain passes. It was necessary to distribute this population quickly in different regions of France but, first of all, to isolate the infectious.

Delousing, cleaning and vaccination were done for this throng, which arrived like a rushing tide in complete disorder. A large number had been exposed to typhus.

Besides government and army physicians, many civilian physicians offered their services, as did the infirmaries of the Red Cross. Packets were requisitioned and transformed into floating hospitals. Three hundred of the 12,000 wounded died. The duty of according refuge was discharged in a satisfactory manner.

BERLIN

(From Our Regular Correspondent)

March 27, 1939.

News of the Universities

Of significance since the report on the universities in *THE JOURNAL* January 28, page 347, was the first conference of university presidents of Greater Germany, held early in March in Berlin at the invitation of the department of education for the reich. It is significant that the presidents of the German university at Prague, of the technical schools in Brünn and Danzig and of the Herder Institute at Riga participated. Minister of State Dr. Wacker, of the department of education, said that the time has arrived for the carrying out of all the reforms necessary to the organization of a common German university. Statewide unity has at last been attained in building up the German university system and German scholarship. Especially important are student enrolment in the universities, teaching personnel and plans for the German university system.

STUDENT ENROLMENT

The student enrolment for professions requiring an academic education is scarcely smaller than, for example, in 1911-1914 (68,000 students today compared with 72,000 at that time). However, the question assumes a different slant if the economic and military demands are taken into consideration. The decrease in the birth rate, the losses incurred in the World War and the elimination of Jews from the academic professions will become noticeable. There will be a shortage of about 30,000 engineers in 1942. Now there is need of 15,000 enrolments for callings that require an academic training. In the next few years an annual shortage of at least 8,000 graduates will have to be reckoned with. The number of college graduates eligible for university studies will fall from 36,000 in the current year to 32,000 in 1940 and probably to 27,000 in 1941. Specific data regarding the enrolment of medical students have not become known. Remedies must be sought. However, the quality of German students and of German scholarship may not be lowered.

TEACHING PERSONNEL

The law just passed regarding the salaries of university teachers establishes the economic security of those of the rank of instructor (dozent). This was a national necessity, for thereby scholarship, which is the greatest asset of German culture, can be furthered. It is hoped that in this way the danger of losing potential university material has been removed. The type of instructor who has no definite income in spite of reaching his fortieth year must disappear forever. Stipends and teaching assignments are not sufficient to insure a steady succession of teachers at the universities. To promote academic scholarship, university teachers must be relieved of financial worries.

PLANS FOR THE GERMAN UNIVERSITY

With the rise of new branches of learning the universities have largely lost the university concept and ideal of "universitas litterarum" that was valid in the last century. Born of specialized needs, specialized schools of higher learning have arisen. However, it is necessary to limit the number of training centers for specialized sciences and to concentrate them

in a few universities. Furthermore, the assignment of functions among the individual universities is to be carried out according to a plan, the tradition of the individual university being taken into consideration. In Berlin a model university is being planned, in which the unity of German scholarship characteristic of the third reich is to be comprehensively represented. However, not even in Berlin are all the specialized sciences to be taught, but rather the fundamental subjects which compose the "universitas," namely, the humanities, jurisprudence and political science, medicine and the pure and applied sciences. These are the subjects that belong to the corporate whole of a university and to that of a technical school of higher learning.

UNIVERSITY SALARIES

The new law on the salaries of university teachers gives an insight into university life. It is the first governmental law of its kind. Until now the administration of the universities was subject to the individual German states. Although the incomes of teachers were fairly uniform, there were differences which frequently provided inducements when positions were to be filled. The basic salaries of full professors ranged between 6,900 and 14,000 marks, the average being about 11,000 marks. To this was added money for rent and various other items. Associate professors received a minimum salary of from 4,400 to 6,000 marks and a maximum of about 7,800 to 10,500 marks. Salaries in Prussia were somewhat higher. Special regulations governed the incomes in special cases for directors of institutes. Some states reserved the right to make exceptions in behalf of distinguished men whom they wanted to secure.

The new law creates a uniform basis for the entire country, inclusive of Austria and the Sudetenland. Full professors are to receive a basic salary of from 7,500 to 11,600 marks and, in special cases, as much as 13,600 marks; associate professors, from 5,700 to 9,000 marks, with a maximum of 11,600. Besides, both classes of teachers are to receive a share of the fees paid for their lectures. A definite income from course fees is guaranteed, the minimum being 1,000 and the maximum 7,000 marks. Provision has been made to grant further additions in special cases "to secure and retain excellent teaching ability." Presidents and deans receive special grants.

A new feature of the law is that now young instructors receive a definite salary of from 3,400 to 7,500 marks from the time of their appointment, together with compensation for rent. Previously "assistance" was granted only for two years and had to be accompanied by a statement of productive scholarship and also of financial circumstances. Besides, the leader of the instructors' club, whose position was political, had to give his opinion. "Assistance" could be withdrawn whenever this local officer regarded it fitting. The provisional phases of the salary system are now removed. Young instructors are thoroughly examined as to their political belief before they are admitted. The new law is a step toward the goal of a uniform law governing the university teachers of the country.

POLITICAL VERSUS ACADEMIC EDUCATION

Studentenführer Dr. Scheel said in February that nothing is more senseless than to assume that a political education is a hindrance to specialized academic training. Any one who thinks so neither has learned from history nor understands the nature of the present constructive program in Germany. The teacher who has no interest in politics is not wanted, for only by basing his specialized knowledge on the unity of Nazi philosophy can he attain his highest professional success. Great importance is attached to working together with the academic youth of other countries. For this reason efforts are made to enable every student to study abroad. The leadership of the universities must constitute a bridge to carry German ideas to other nations.

FOREIGN STUDY

Last year the question of studying abroad led to diplomatic inquiries. The foreign bureau of the student leadership requested students to consider Swiss universities for the summer semester of 1939, advising that two semesters spent in Switzerland would receive full credit. Aid was available to needy students and to those especially willing to volunteer. The condition attached to the offer required these students to take part first in Germany in the "labor association Switzerland," a special form of a Nazi training course for students who go abroad. The words "especially willing to volunteer" led to diplomatic steps by the Swiss government, with a request for elucidation, and an explanation was given.

GERMAN CLINICS IN PRAGUE

What happened in the German clinics in Prague was reported in *THE JOURNAL* January 7, page 72. For a time the plan was to remove the German schools of higher learning in Prague to the Sudetenland. This plan was not carried out. The winter semester was opened at the German university in Prague January 11, after a delay of two months caused by political events, under the leadership of the Nazi student body. Almost all Jewish students have been removed. The number of students at the German university (there is also a Czech university in Prague) is 3,000 instead of the former 5,000. The decrease is due in part to the elimination of Jews and in part to labor conscription and military service, which young Sudeten Germans must now undergo as members of the German reich. In the summer semester the complete reorganization of these two schools of higher learning after the pattern of the German universities is to become effective.

PALESTINE

(From Our Regular Correspondent)

Tel-Aviv, April 21, 1939.

Medical Refugees in Palestine

The rise of Hitlerism produced profound repercussions on the status of Jewish physicians in Germany. Their exodus, however, was by no means as sudden as that of their colleagues in Austria after its annexation to the German reich. When the great wave of German doctors came to Palestine in 1933 the Workers' Health Insurance Fund, like the rest of the Jewish community, enjoyed comparative prosperity. From 1933 to 1939 the number of physicians was increased from eighty to 312, of whom 138 were of German origin, twenty-nine from Austria and sixty-five from various other countries.

The Austrian physicians arriving during the past year have found the country in a disturbed rather than in a prosperous state. The highly specialized character of their training and the impossibility of transferring their capital have made their rehabilitation in a new country difficult. As but few new openings were available, physicians were sent temporarily to posts hitherto held by laymen, for which medical training is desirable but not necessary, such as those of assistants in laboratories and x-ray institutes and inspectors of sanitation in rural settlements.

Docent Rudolph Strisower has been appointed consultant to the Diagnostic Committee, which examines difficult cases at the Tel-Aviv Central Dispensary. Dr. Strisower was awarded many honors for his services as bacteriologist and epidemiologist in the Austrian army during the World War. After the armistice he entered the Vienna Infirmary and General Hospital as assistant to the specialist for diseases of the heart and blood vessels Professor Pal and later worked with Professor Wenckebach.

Docent Robert Lenk is in charge of x-ray work in the Kupat-Holim Hospital at Afoula and in its central dispensary in Haifa. He has published eighty-seven scientific papers and was director of the Roentgen Institute of the Vienna Workers' Sick Fund from 1928 to 1938.

Dr. Ernest Spira, who has had wide experience in orthopedic surgery in Prague, Vienna and Leipzig, is now working as orthopedic surgeon in the Tel-Aviv Central Dispensary.

Dr. Aria Rappaport, chemist and bacteriologist of the Vienna Hygiene Institute, has been added to the staff of the Beilinson Hospital.

Dr. Erich Nassau has been appointed chief of the pediatrics department at the Emek Hospital and inspector of children's institutions in the Valley of Jezreel. He is joint author with Prof. L. F. Mayer of a textbook on children's nutrition, was in charge of the pediatrics department of the Berlin Municipal Hospital and was director of a sanatorium for children with chronic diseases.

Dr. Karl Kawalek, who has been appointed resident gynecologist at the Emek Hospital, has had wide experience in this field as assistant to Professor Lorenz, Professor Novak and Docent Hidler.

Dr. Otto Tetzner, now consultant in pediatrics in the Tel-Aviv Central Dispensary, was first assistant in Professor Knoepfelmacher's children's clinic from 1920 to 1927 and thereafter pediatrician for the Vienna Workers' Sick Fund.

Prof. Walter Strauss was formerly professor of hygiene at the Berlin University and permanent adviser to the Hygiene Section of the League of Nations. In this capacity he was sent to various countries to investigate the effect of climatic conditions on work and fatigue. He has already been of inestimable assistance to Kupat Holim in the investigation of rural hygiene and sanitation problems. During an epidemic of typhoid in the Jordan Valley at Afikim a committee of experts, including Professor Strauss, was able by immediate action to check its spread. The committee flew by plane, as the roads were not safe for travel, and laboratory equipment was immediately sent to them. Invaluable aid was rendered by the government department of health, which made room for all patients in the government hospital at Haifa. Professor Strauss has recently been appointed hygienic adviser to the Industrial Hygiene Committee of the General Federation of Labor (Histadruth) in Palestine.

Prof. Bernhard Gottlieb, professor of dentistry of Vienna, is now consultant to the Tel-Aviv Dental Dispensaries. He is an honorary member of the British Royal Society, of the Allied Dental Council of America and of many other honorary societies in various countries. He has made important contributions to the etiology and treatment of pyorrhea, root canal work and other fields. He has already published the first part of his forthcoming book on dentistry in individual phases, the treatment of root canals.

Physicians entering the Kupat-Holim service regardless of their previous merits and standards have shown a willingness to adapt themselves to conditions in the country. They have been ready to supplement their European medical education by a special study of local endemic diseases. They have been ready to acquire a new language as well as to understand the physician-patient relationship in a workers' cooperative medical organization. This specific training has been provided in the clinics and hospitals of the organization, and their first appointment frequently finds them in rural dispensaries and even in labor camps in dangerous sections of the country.

The Hadassah Medical Organization has extended similar aid both by direct appointments and by offering facilities for study, observation and training in its hospitals and clinics.

During the past three years twenty-four physicians from Germany, Austria and latterly Italy have been appointed by Hadassah to its hospitals and affiliated departments. Among these is Prof. Enrico Emilio Franco, formerly head of the department of anatomy and histologic pathology at the Royal University of Pisa. Another recent appointment is that of Docent F. Mandel, author of 183 scientific papers, former assis-

tant in the Vienna General Infirmary and latterly head of the surgery department of the Canning-Childs Hospital.

New refugees are daily appearing. Among those who are known for their scientific work abroad and are not yet affiliated with medical institutions is the biochemist Prof. Harry Schaeffer, professor of internal medicine at the University of Breslau until 1933 and thereafter head of the department of internal medicine of the Breslau Jewish Hospital.

The following eminent physicians have taken up their residence in Palestine: the gynecologist Prof. Bernhard Zondek, the internists Prof. Hermann Zondek, Prof. S. G. Zondek, Docent Kleberg, Dr. Heller, Dr. Lewkowitz, Professor Citron and Professor Minz, the entomologist and helminthologist Prof. S. Adler, the pediatricians Prof. L. F. Mayer and Professor Rosenbaum, the radiologist Professor Halberstatter, the neurologist Professor Pappenheim and the gynecologist Professor Schonholtz.

The problem of assisting medical refugees is daily assuming larger proportions as letters continue to pour in from Jewish physicians in Italy and Czechoslovakia, Poland and Rumania.

The New Haifa Government Hospital

The new government hospital was officially opened by High Commissioner Sir Harold McMichael Dec. 22, 1938. This hospital, of 230 beds, is one of the largest in the country. The buildings are beautifully located on a site overlooking the Haifa Bay and the Carmel Range. They comprise (1) a main block of six stories containing wards and nurses' quarters, medical officers' quarters and kitchen and dining rooms, all facing the prevailing summer winds from the northwest but avoiding the sun's rays in the summer; (2) an operation, outpatient x-ray and laboratory block of three stories, also facing northwest but separated from the main building by a causeway to enhance free circulation of air from north to west; (3) an admission block, containing first aid rooms, offices and a pharmacy under the causeway; (4) a service block at ground level and a basement containing laundry, disinfection quarters, mortuary, chapel, garages and staff quarters, and (5) five one story isolation pavilions, separated from the main hospital, for patients with infectious diseases.

The hospital is open to all communities to the limit of its capacity. In addition to surgical, medical and maternity patients, it provides for all patients with the more serious infectious diseases from the town and districts of Haifa, Acre and Nazareth and in case of need even further north.

Medical Department of the Jewish National and University Library

The Jewish National and University Library, the largest in the Near East, with 350,000 volumes, owes its existence to the Russian physician Dr. Chasanowitch, who more than forty years ago conceived the idea of a Jewish National Library in Jerusalem. His collection formed the nucleus of the present university library.

It was the insight and the devotion of the American physician Dr. Julius Jareho which transformed the medical department of the university library into an institution of vital importance for the medical progress of the country. For fifteen years Dr. Jareho has not only been devoting himself to the development of the library but has succeeded in enlisting the aid and interest of a wide circle of friends and colleagues in America. Since 1925 hundreds of the most important periodicals and thousands of recent medical works have been sent to the library by the American Jewish Physicians' Committee, under the presidency of Dr. Nathan Ratnoff and with the active support of Dr. Emanuel Libman.

Apart from these extensive contributions, mention should be made of the large ophthalmic library donated by Professor Deutschmann, the collection of the Nobel Prize winner Barani,

the collections of dental works sent by Drs. Wachtel, Misch and Kantorowitsch and the works on the history of medicine donated by Professor Libman and Dr. Friedenwald. The medical department now contains approximately 36,000 volumes, and some 3,000 antiquated or less important works. Two hundred and fifty current periodicals are displayed in its reading room, and five branch libraries are being maintained by it in various parts of the country.

In 1929, the collections of the library were transferred to the new library building on Mount Scopus. In order to meet the requirements of physicians practicing in town, a reading room for periodicals and a reference library of some 1,200 volumes was established in the Nathan Straus Health Center and later in the Hadassah Hospital. Branch libraries have been opened by the medical department in Tel-Aviv, Haifa, Afoula, Tiberias and Petah-Tikva.

THE NETHERLANDS

(From Our Regular Correspondent)

Feb. 16, 1939.

International Congress of Malariaology

At the International Congress of Malariaology, held in the grand auditorium of the Institut Colonial, the minister of colonies and a representative of Queen Wilhelmina were present. Inaugural addresses were delivered by Professors Snyders, Grijns and Swellengrebel and Minister Welter. Some 500 physicians from Europe, Africa, America, the British Indies and the Netherlands Indies attended. The program included 114 reports on deficiency diseases, filarioses, yellow fever, anti-plague vaccination, *Leptospira*, *Trypanosoma*, *Glossina*, *Rickettsia*, rabies and paludism.

The pathogenesis of filarioses was discussed by J. Rodhain. The penetration of the human organism by infectious larval filariae does not seem to be accompanied by any appreciable reaction, general or local. The eosinophilia of the blood which usually ensues seems to be independent of external clinical manifestations. The pathogenesis of the clinical symptoms remains obscure. Some of the morbid signs related to filariosis may be attributed to local irritation provoked by adult filariae, others to indirect reactions of an allergic or toxic nature, and still others to the presence of larval filariae. G. F. Stefanopoulo discussed recent advances in yellow fever research. The diagnosis of yellow fever has become possible through the application of serologic methods (the protection test), histopathologic methods (viscerotomy) and observation of the virus (inoculation of the monkey and the white mouse). The homogeneity of the amaril virus has been established. An exact delimitation of the zones of yellow fever on both continents has been made and, what is more, the presence of the virus, in the absence of *Stegomyia*, has been demonstrated in the South American jungle. The methods of prophylaxis have become more numerous. Anti-amaril vaccination can now be considered an effective preventive measure; the discovery of the attenuated virus by culture of embryonal tissues has made possible mass immunizations of populations which could not be protected by any other known means. The systematic fight against *Stegomyia* has produced such favorable results that campaigns of this sort are now felt to be imperative for the protection of urban populations.

Georges Lavier, discussing the antiglossina campaign, said that an effective campaign against *Glossina* in a particular region cannot be initiated without a sound knowledge of the character and biology of the local species. Major measures are directed against the vegetation considered to be the breeding place of *Glossina*. Minor measures include the capture of the flies by means of nets or traps. Biologic prophylaxis envisages the utilization as parasites on the pupa of creatures that prey on *Glossina*.

Deaths

Alexander Lambert * President of the American Medical Association 1919-1920, died in New York at the Doctors' Hospital May 9, aged 77. Dr. Lambert was born in New York Dec. 15, 1861, the son of Dr. Edward W. and Martha W. Lambert. He received his bachelor of arts degree from Yale University in 1884, the bachelor of philosophy degree in 1885 and the M.D. degree from the College of Physicians and Surgeons of Columbia University in 1888. The bachelor of philosophy degree was in association with research under Dr. Russell H. Chittenden. After two years of study in Europe, Dr. Lambert was associated with Dr. T. Mitchell Prudden and Dr. William H. Park in the investigation of tetanus and diphtheria antitoxin. Early in his career he began teaching, becoming professor of clinical medicine at Cornell University Medical College, holding that position from 1898 to 1931. He was also assistant bacteriologist in the New York Department of Health from 1894 to 1901 and attending physician in Bellevue Hospital from 1894 to 1933.

Throughout his career Dr. Lambert took great interest in the work of organized medicine, serving as president of the Medical Society of the State of New York, as a member of the House of Delegates of the American Medical Association in 1911, third vice president in 1909. He was appointed a member of the Judicial Council in 1911 and became chairman in 1912, holding that position until his election to the position of President-Elect in 1918. He was also chairman of the Section on Practice of Medicine 1903-1904. He served in New York City on the Mayor's Committee on Narcotic Addiction in 1927 and as a member of a state commission on the same subject. His memberships in medical societies included the Association of American Physicians, the Harvey Society, the American Association for the Advancement of Science, the American Heart Association and several other local medical bodies. In 1917 he was appointed a Major in the Medical Corps and sent to France, where he remained until the Armistice, serving in France also as medical head of the American Red Cross.

Early in his career he became closely associated with former President Theodore Roosevelt, acting for many years as his personal physician and also accompanying him on hunting and fishing trips. In 1919, following the death of Theodore Roosevelt, Dr. Lambert became the director of the Roosevelt Memorial Association. Dr. Lambert is also credited with having been instrumental in maintaining Gen. William C. Gorgas as director of the sanitary work during the building of the Panama Canal after an attack had been made on the work of General Gorgas by some of the lay officials in charge of the building of the Canal.

Throughout his career Dr. Lambert gave special attention to problems of alcoholic and narcotic addiction and to diseases of the heart. He was the author of numerous contributions to medical periodical literature dealing with these subjects. Dr. Lambert was widely known as a distinguished leader in the field of medicine, as an inspiring organizer and as an influential physician.

Richard Clarke Cabot * widely known as a physician, teacher and author, died in Boston, May 8, after a long illness. Dr. Cabot was born in Brookline, Mass., the son of James Elliott Cabot and Elizabeth Dwight Cabot, on May 21, 1868. His father was an overseer of Harvard University and was noted as the biographer of Ralph Waldo Emerson. After graduation from

Harvard in 1889, where he won honors in the classics and in philosophy and election to Phi Beta Kappa, Dr. Cabot continued his studies in Harvard Medical School and graduated in 1892. He became assistant in medicine in Harvard Medical School in 1899, instructor in 1903, assistant professor in 1908, professor in 1918 and, since 1933, has been professor emeritus.

Dr. Cabot's interest in ethics and philosophy persisted throughout his life; he lectured on logic in Harvard in 1903, and was appointed professor of social ethics in 1920, holding that position until 1934.

As part of his medical career, Dr. Cabot became physician to the Outpatient Department of the Massachusetts General Hospital in 1898, and was also consultant in the Massachusetts General Hospital, New England Hospital for Women, the Westboro School for Boys, the Lancaster School for Girls, the Brockton Hospital and the Sturdy Memorial Hospital of Attleboro. He was also a former visiting physician to the Channing Home, consulting physician to the Massachusetts Eye and Ear Infirmary and chief of staff at the Mount Sinai Hospital.

During the World War, Dr. Cabot served as a major in the Medical Corps at a Bordeaux base hospital, remaining there from July 1917 to February 1919, except for a period of five months when he was associated with the Red Cross Service in Paris. He was commissioned Lieutenant Colonel Nov. 6, 1918, and honorably discharged in February 1919.

As for the social side of his interests, he was president of the National Conference of Social Work in 1931 and president of the Massachusetts Anti-Saloon League in 1931-1933; he was awarded the gold medal by the National Institute of Social Science in 1931.

The University of Rochester bestowed on him the LL.D. degree in 1930, and Syracuse University awarded him the L.H.D. degree in 1934.

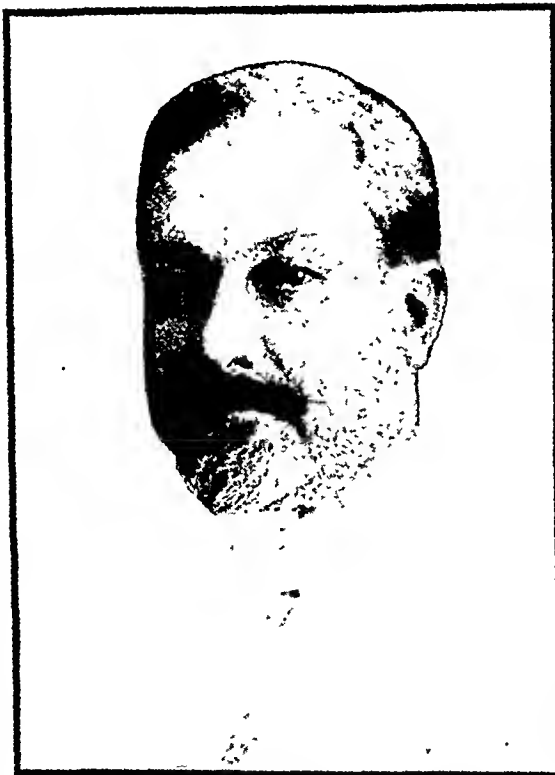
In the American Medical Association, Dr. Cabot was chairman of the Section on Practice of Medicine from 1904 to 1905 and a member of the House of Delegates in 1907 and in 1915.

Early in his career, Dr. Cabot attracted wide public attention by his attitudes in relationship to the social aspects of medical care. In 1913, he pointed out that there were far too many doctors, and urged reorganization of medicine for group practice, with the suggestion that, since the University

of California had been able to provide students with medical care for \$5 a year, it should be possible to do the same for all people. He was also widely noted for the statement that out of 400 diseases only seven were curable by drugs and five by inoculations. Moreover, his statement to the effect that the vast majority of diagnoses were wrong as based on the results of postmortem examinations, made many years ago, was repeatedly quoted in the press.

Perhaps Dr. Cabot was most widely known for writings, particularly in the field of social welfare. These publications included "Social Service and the Art of Healing," 1909; "What Men Live By," 1914; "The Rewards and Training of a Physician," 1917; "Social Work," 1919; "Adventures on the Borderlands of Ethics," 1926; "The Meaning of Right and Wrong," 1933, and "Christianity and Sex," 1937. Particularly known to the medical profession are his writings in medicine, including "Clinical Examination of the Blood," 1896, of which five editions were issued, and his work on "Physical Diagnosis," 1901, of which ten editions were issued. Well known also were his books on "Case Teaching in Medicine," 1906, reprinted in more recent years in a special series in the *New England Journal of Medicine*, and "Differential Diagnosis," 1911. His last public appearance was in the New York Herald Tribune Forum, 1938.

Dr. Cabot will long be remembered for his philosophy and as a leader in stimulating social habits of thought.



ALEXANDER LAMBERT, M.D., 1861-1939

Frank Parsons Norbury ☉ Jacksonville, Ill.; Long Island College Hospital, Brooklyn, 1888; secretary of the Section of Neurology and Medical Jurisprudence, 1893-1894, and member of the House of Delegates of the American Medical Association in 1904; past president of the Morgan County Medical Society; fellow of the American College of Physicians and member of the American Psychiatric Association; past president and secretary of the Mississippi Valley Medical Association; professor of internal medicine, St. Louis College of Physicians and Surgeons, 1895-1896, and professor of nervous and mental diseases, Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1904-1908; alienist, state board of administration, 1911-1913; superintendent of the Kanikakee (Ill.) State Hospital, 1909-1911; acting medical director of the National Committee for Mental Hygiene during the World War; president and medical director of the Norbury Sanitarium; aged 75; died, March 14, of coronary thrombosis.

Noble Murray Eberhart ☉ Chicago; Bennett Medical College, Chicago, 1894; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; director of the x-ray laboratory and head of the department of physiological therapeutics, Loyola University School of Medicine, 1911-1913, and professor of electrophysics, Post-Graduate Medical School, 1902-1905; at various times professor and head of the department of electrotherapy, American College of Medicine and Surgery, Medical Department of Valparaiso University, and Chicago College of Medicine and Surgery, Medical Department of Valparaiso University; president of the North Shore Branch, 1912-1913, and member of the Council, Chicago Medical Society, 1913-1915; author of "Manual of High Frequency Currents," which passed through eight editions; aged 68; died, February 9, of epithelioma of the left hand with metastasis.

Jose Guillermo Lewis, Colon, Republic of Panama; Georgetown University School of Medicine, Washington, D. C., 1923; member of the Medical Association of the Isthmian Canal Zone; fellow of the American College of Surgeons; at one time instructor of surgery at his alma mater; formerly chief surgeon and chief of staff, Eastern Dispensary and Casualty Hospital; chief of the surgical service, including obstetrics and gynecology, Amador Guerrero Hospital; aged 40; died, February 12.

Samuel Robert Slaymaker ☉ Chicago; Rush Medical College, Chicago, 1892; clinical professor of medicine at his alma mater; past president of the Chicago Society of Internal Medicine; president and attending physician to the Washington Boulevard Hospital; associate attending physician to the Presbyterian Hospital; for many years on the attending staff of the Cook County Hospital; served during the World War; aged 74; died, May 3, of carcinoma of the pancreas.

George Charles Kreutz, Detroit; Washington University School of Medicine, St. Louis, 1924; member of the Michigan State Medical Society and American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; surgeon in charge, division of otolaryngology, Henry Ford Hospital; aged 42; died, February 1, of pulmonary embolus following an operation for hernia.

Joseph Thompson McKinney ☉ Roanoke, Va.; Medical College of Virginia, Richmond, 1912; member of the American Roentgen Ray Society, Radiological Society of North America and the American College of Radiology; served during the World War; on the staff of the Lewis-Gale Hospital; aged 49; died, February 3, of carcinoma of the prostate with metastasis to the liver and lungs.

Paul Eugene Lineback, Emory University, Ga.; Drake University Medical Department, Des Moines, Iowa, 1911; professor of micro-anatomy and neuro-anatomy at the Emory University School of Medicine; fellow of the American College of Physicians; member of the American Association of Anatomists; co-author of "Anatomy of the Rhesus Monkey"; aged 59; died, February 28.

George Goodhue ☉ Dayton, Ohio; Dartmouth Medical School, Hanover, N. H., 1880; University of the City of New York Medical Department, 1880; past president of the Montgomery County Medical Society; fellow of the American College of Surgeons; formerly health officer; consulting surgeon to the Miami Valley Hospital; aged 85; died, February 25.

Stephen H. Knight ☉ Detroit; New York Homeopathic Medical College, New York, 1886; fellow of the American College of Surgeons; at one time assistant professor of surgery at the Detroit College of Medicine and Surgery; for many years on the staff of the Grace Hospital; aged 76; died, February 9, of arteriosclerotic heart disease.

Page D. Barlow, McMechen, W. Va.; Baltimore Medical College, 1895; member of the West Virginia State Medical Association; past president of the Marshall County Medical Society; aged 65; on the staff of the Reynolds Memorial Hospital, Glendale, where he died, February 23, of diabetes mellitus and lobar pneumonia.

Frank Wallace Curtis, Stewartsville, N. J.; Long Island College Hospital, Brooklyn, 1892; member of the Medical Society of New Jersey; on the staff of the Easton (Pa.) Hospital; aged 73; died, February 9, in the King's Daughters' Hospital, Portsmouth, Va., of cerebral hemorrhage and hemiplegia.

Thomas J. Farley, Amherstdale, W. Va.; University of Louisville (Ky.) Medical Department, 1913; member of the West Virginia State Medical Association; formerly county health officer; aged 54; died, February 18, in the Mercy Hospital, Logan, following an operation for a ruptured appendix.

Harry Cullen Kariher, Champaign, Ill.; Rush Medical College, Chicago, 1903; member of the Illinois State Medical Society; past president of the Champaign County Medical Society; served during the World War; aged 59; on the staff of the Burnham City Hospital, where he died, February 5.

Robert Caldwell McChord, Lebanon, Ky.; Louisville (Ky.) Medical College, 1875; member of the Kentucky State Medical Association; fellow of the American College of Surgeons; formerly president of the board of education and bank president; aged 87; died, February 19, of arteriosclerosis.

Robert Christie Kemp, Baton Rouge, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1900; fellow of the American College of Surgeons; visiting surgeon to the Baton Rouge Hospital and Our Lady of the Lake Sanitarium; aged 65; died, February 19, of pneumonia.

Gaston Louis Gaudet, Litcher, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1904; member of the Louisiana State Medical Society; aged 59; died, February 7, in the Hotel Dieu, Sisters' Hospital, New Orleans, of auricular fibrillation and pleurisy with effusion.

James McFaddin Dick ☉ Salisbury, Md.; University of Maryland School of Medicine, Baltimore, 1895; fellow of the American College of Surgeons; on the staff of the Peninsula General Hospital; aged 67; died, February 17, of cerebral hemorrhage and arteriosclerosis.

Edwin Archer Gerhart, Seattle; Hahnemann Medical College and Hospital of Philadelphia, 1901; member of the Washington State Medical Association; served during the World War; aged 60; died, February 28, in a local hospital of carcinoma of the liver.

Vernon Sylvester Fildes, Olney, Ill.; Washington University School of Medicine, St. Louis, 1905; member of the Illinois State Medical Society; aged 57; died, February 4, in the Olney Sanitarium, of bronchopneumonia and cerebral hemorrhage.

Walter Pearre, Waynesboro, Pa.; Bellevue Hospital Medical College, New York, 1884; Hahnemann Medical College and Hospital of Philadelphia, 1885; aged 77; died, January 16, at the Waynesboro Hospital, of gastric ulcer with pyloric stenosis.

Richard Lodwick Gray, Clayton, N. Y.; Bellevue Hospital Medical College, New York, 1898; member of the Medical Society of the State of New York; aged 68; died, January 28, of carcinoma of the urinary bladder with metastases to the breast.

James M. Fenton, Baltimore; University of Virginia Department of Medicine, Charlottesville, 1894; member of the Medical Society of Virginia; formerly coroner of the central district; aged 70; died, February 17, of cardiac decompensation.

Frederick Yingling Allen, St. Petersburg, Fla.; Cleveland College of Physicians and Surgeons, Medical Department Ohio Wesleyan University, 1898; formerly associate professor of histology at his alma mater; aged 65; died, February 26.

Francis Earle Briggs, Ludlow, Ill.; College of Physicians and Surgeons of Chicago; School of Medicine of the University of Illinois, 1907; member of the Illinois State Medical Society; aged 56; died, February 2, of carcinoma of the stomach.

William Clarkson Waggoner, New York; Miami Medical College, Cincinnati, 1903; formerly on the faculty of the Long Island College Hospital, Brooklyn; served during the World War; aged 57; died, January 27, in Ossining.

Daniel James Leo Harrington ☉ Boston; Tufts College Medical School, Boston, 1910; on the staffs of the Boston City Hospital and the Carney Hospital; aged 52; died, February 20, in St. Francis Hospital, Miami Beach, Fla.

Martin Cole, Hainesville, N. J.; Harvard University Medical School, Boston, 1873; aged 89; died, February 25, in the Newton (N. J.) Memorial Hospital, of chronic myocarditis and fracture of the hip received in a fall on the grass.

William Edgar Fahrney @ Broadway, Va.; University of Maryland School of Medicine, Baltimore, 1897; aged 65; died, February 13, at the University Hospital, Charlottesville, of arteriosclerosis, cerebral thrombosis and pneumonia.

Clarence Kelsay, Evansville, Ind.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; on the staff of the Protestant Deaconess Hospital; aged 62; died, February 8, of pneumonia with hypertension.

Joseph Hall Jones, Baltimore; University of Alabama School of Medicine, 1912; served during the World War; acting assistant surgeon, U. S. Public Health Service; aged 52; died, February 20, of coronary thrombosis.

James Francis Bowen, Hinsdale, Mass.; University of Vermont College of Medicine, Burlington, 1911; served during the World War; aged 60; died, February 21, in St. Luke's Hospital, Pittsfield, of cerebral hemorrhage.

Edward Daniel Hartnett, Boston; Harvard University Medical School, Boston, 1898; member of the Massachusetts Medical Society; served during the World War; aged 64; died, February 13, of cerebral hemorrhage.

James Asbury Harper @ Greenfield, Iowa; Bellevue Hospital Medical College, New York, 1896; formerly secretary of the Adair County Medical Society; aged 71; died, February 9, of arteriosclerosis and coronary occlusion.

Thomas Archibald McIntyre, Colorado Springs, Colo.; Gross Medical College, Denver, 1902; member of the Colorado State Medical Society; on the staff of St. Francis Hospital; aged 52; died, January 24, of diphtheria.

Marcus S. Lemlich, Brooklyn; New York Medical College and Flower Hospital, New York, 1914; on the staffs of the Unity Hospital and the Cumberland Hospital; aged 52; died, January 18, in the Mount Sinai Hospital.

Frank G. Emerson, Wellington, Kan.; State University of Iowa College of Medicine, Iowa City, 1885; member of the Kansas Medical Society; aged 78; died, February 12, of an injury received in a fall in a bathtub.

Alfred M. Houston @ Joliet, Ill.; Hahnemann Medical College and Hospital, Chicago, 1904; on the staffs of the Silver Cross Hospital and St. Joseph's Hospital; aged 63; died, February 9, of sarcoma of the maxilla.

Mecislaus Stanley Kreda, National Military Home, Ohio; Wayne University College of Medicine, Detroit, 1933; on the staff of the Veterans Administration Facility; aged 35; died, February 21, of pulmonary embolism.

Rudolph J. Maas @ Houghton, Mich.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1880; formerly on the staff of St. Joseph's Hospital, Hancock; aged 83; died, February 7, of acute coronary disease.

John L. McCormick, Yazoo City, Miss.; Jefferson Medical College of Philadelphia, 1899; member of the Mississippi State Medical Association; on the staff of the King's Daughters Hospital; aged 67; died, January 23.

Joseph H. McGauhey @ White Cloud, Kan.; Missouri Medical College, St. Louis, 1888; bank president; formerly member of the school board; aged 77; died, February 8, in St. Joseph's Hospital, St. Joseph, Mo.

Ira Lincoln Fetterhoff, Baltimore; University of Maryland School of Medicine, Baltimore, 1885; Hahnemann Medical College and Hospital of Philadelphia, 1886; aged 74; died, February 25, of diabetes mellitus.

Sheldon S. De Lancey, Williamsport, Ind.; Hahnemann Medical College and Hospital, Chicago, 1882; member of the Indiana State Medical Association; county health officer; aged 78; died, February 7, of senility.

Bruce D. Campbell, Dearborn, Mich.; Detroit College of Medicine and Surgery, 1915; chief physician and surgeon of hospitals of the Ford Motor Company's plants; aged 45; died, March 20, of heart disease.

George Benjamin Hulburd, Jericho, Vt.; University of Vermont College of Medicine, Burlington, 1885; member of the Vermont State Medical Society; aged 77; died, February 4, of carcinoma of the rectum.

Earle McEwen @ Mason City, Iowa; Hahnemann Medical College and Hospital, Chicago, 1881; past president of the Cerro Gordo County Medical Society; aged 81; died, February 17, of coronary thrombosis.

Christopher C. Gray, Batesville, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1888; member of the Arkansas Medical Society; aged 79; died, February 17, of hypostatic pneumonia.

Joseph B. Kepler Evans, McGuffey, Ohio; American Eclectic Medical College, Cincinnati, 1889; member of the Ohio State Medical Association; aged 74; died, February 10, of pulmonary tuberculosis.

Alford Comer Knight, Jacksonville, Fla.; Medical College of the State of South Carolina, Charleston, 1911; member of the Florida Medical Association; formerly a pharmacist; aged 63; died, February 11.

Willard Blossom Segur @ Ware, Mass.; Dartmouth Medical School, Hanover, N. H., 1892; on the staff of the Mary Lane Hospital; aged 73; died, January 27, in the Deaconess Hospital, Boston.

Oscar Newton Lightner, Laredo, Texas; Washington University School of Medicine, St. Louis, 1905; served during the World War; aged 57; died, February 13, in the Nix Hospital, San Antonio.

Wladimir Feodor de Niedman, Los Altos, Calif.; Howard University College of Medicine, Washington, D. C., 1884; veteran of the Spanish-American War; aged 84; died in January in San Francisco.

James Perry Houston, Traverse City, Mich.; Chicago Medical College, 1889; member of the Michigan State Medical Society; aged 78; died, February 27, in the Grand Traverse County Hospital.

Silas Offen Witherbee, Middletown, Ky.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1867; formerly bank president; aged 92; died, January 2.

Septimus Jordan, Richburg, S. C.; Medical College of the State of South Carolina, Charleston, 1911; member of the South Carolina Medical Association; aged 51; died, February 15, of arthritis.

James Thomas Justice, Kernersville, N. C.; North Carolina Medical College, Davidson, 1904; for many years member of the school board; aged 65; died, February 15, of carcinoma of the prostate.

Henry Eben Hunt, Roodhouse, Ill.; Northwestern University Medical School, Chicago, 1896; aged 66; died, February 8, in Our Saviour's Hospital, Jacksonville, of carcinoma of the rectum.

Charles Holt Forbes, Athol, Mass.; New York Homeopathic Medical College, New York, 1883; aged 79; died, February 7, in the Massachusetts Masonic Hospital, Shrewsbury, of myocarditis.

B. Clinton Marsh, Livingston, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1886; member of the State Medical Association of Texas; aged 78; died, February 22.

Joseph Anton Denking, Brookline, Mass.; Vermont Medical College, Rutland, 1889; aged 76; died, February 27, in Boston of diabetes mellitus, cerebral arteriosclerosis and chronic myocarditis.

Marriages

EDWARD DUNNER, Brooklyn, to Miss Reichel Connor of Pittston, Pa., March 19.

JAMES L. SEIBOLD to Miss Margaret Stewart, both of Birmingham, Ala., April 29.

THOMAS E. BRADLEY to Miss Evelyn Mashburn, both of Fitzgerald, Ga., in April.

JOSEPH A. HESCH, Aldan, Pa., to Miss Marie B. McGowan of Philadelphia, April 29.

THOMAS Y. DORWART to Miss Ellen Vaughn, both of Lexington, Neb., February 14.

BENJAMIN HARTWELL BOYD JR. to Miss Margaret McCarty, both of Atlanta, Ga., April 29.

JOSEPH HELMS FARROW, New York, to Miss Florence Skinner of Kansas City, Mo., April 28.

JOHN GOODRICH SMITH, Rocky Mount, N. C., to Miss Mary Lillian Wagner of Warrenton, April 25.

WILLIAM EDGAR WADDELL, Lexington, Va., to Miss Joan Thompson of St. Johns, Newfoundland, recently.

DANIEL O'CONNELL SAYERS, Waterbury, Conn., to Miss Mary Adams Oliver of Mount Olive, N. C., in Goldsboro, N. C., in April.

Bureau of Investigation

SIXTH LABEL FOR LYDIA E. PINKHAM'S VEGETABLE COMPOUND FINALLY BARES FORMULA

Actual Ingredients Exposed for the First Time

The Bureau of Investigation called attention to a new label for "Lydia E. Pinkham's Vegetable Compound" in THE JOURNAL Dec. 17, 1938. The label which was discussed at that time indicated that a new ingredient—vitamin B₁—had been added and that the name of the preparation had been changed to "Lydia E. Pinkham's Vegetable Compound (With Vitamin B₁)." This label is reproduced here, along with an even newer label on which the active ingredients are listed.

The previous article discussed whether or not vitamin B₁ was indicated in any appreciable percentage of those who took this preparation. At the same time attention was called to the fact that there was probably nothing harmful in its addition to the Compound. Nevertheless it is a question whether or not a preparation containing 15 per cent alcohol would be useful to persons deficient in vitamin B₁ and who might take this remedy for the purpose of obtaining additional vitamin B₁.

In the previous article four older labels for this preparation were reproduced. The first label appeared before the enactment of the Food and Drugs Act of 1906, as amended, on which the preparation was claimed to be "A Sure Cure for Prolapsus Uteri, or Falling of the Womb, and All Female Weaknesses." The next three labels comprised modifications of this claim in accordance with the act of 1906. In the first of these the phrase "A Sure Cure" was deleted. In the second this wording was replaced by the phrase "Recommended for the Treatment of Non-Surgical Cases of Weaknesses and Disorders of the Female Generative Organs, Catarrhal Leucorrhoea and Irritation." The final label which was issued under the act of 1906 merely con-

glucosides, mercury, ouabain, strophanthin, strychnine, thyroid, or any derivative or preparation of any such substances, contained therein; Provided, That to the extent that compliance with the requirements of clause (2) of this paragraph is impracticable, exemptions shall be established by regulations promulgated by the Secretary."

The second label reproduced in this article appears on the product as it is purchased over the counter today. In accordance with the stipulations quoted above, this label includes a list of the active ingredients. Thus, for the first time in the many years that this preparation has been on the American market, a purchaser is informed as to the nature of the product. Granted that the meaning of these various names of drugs is not particularly informative to the general public, nevertheless the ingredients are actually disclosed. Now agencies interested in keeping the public informed can call attention to the ingredients and their significance in modern therapeutics. There follows herewith a brief consideration of the ingredients listed on the label of Lydia Pinkham's Compound. The phrases which appear in quotation marks in the paragraphs below are taken from the present edition (or previous editions, in cases of those drugs which are no longer included in the present edition of the U. S. P. or N. F.) of the "Epitome of the U. S. P. and N. F." (A. M. A. Press).¹

Crystalline vitamin B₁ is admittedly useful in cases in which there is a deficiency of this vitamin. Since the public buys the Pinkham preparation without consulting a physician, it is difficult to know just how people are able to determine that they have a need for this vitamin. Even granting such a need, there is no occasion for taking this drug, which is available in pure form and which is available in many foods, in a solution containing 15 per cent alcohol.

Gentian. The latest edition of the United States Pharmacopeia includes this item. It is "probably the most widely used of the simple bitters."

Black cohosh. This drug appears in the most recent edition of the National Formulary under the name Cimicifuga. It is "a 'domestic medicine' that has been tried as a stomachic, antispasmodic, aphrodisiac, diaphoretic, diuretic and expectorant, but which has not been found to possess definite value."

True unicorn. This drug appears in the latest edition of the National Formulary under the name Aletris and is a root which is "used in proprietary 'female remedies' without evidence of value."

False unicorn. This drug appears in the latest edition of the National Formulary under the name Helonias and has been stated to be an "ingredient of 'female remedies'; without established value."

Liferoor. This drug no longer appears in the official compendiums but was included in the 1926 edition of the National Formulary under the name Senecio and has been said to have been used by the North American Indians for healing wounds. "It has been used in a variety of conditions, but it is entirely superfluous."

Pleurisy root. This drug was also last heard of officially in the 1926 edition of the National Formulary and has been described as "an obsolete domestic remedy for pleurisy, also used as a diaphoretic. Probably without value."

Dandelion. This appears in the present edition of the National Formulary under the title Taraxacum. It "has been used as a bitter tonic (without advantage over gentian) and is a mild laxative in habitual constipation (inferior to drugs like cascara sagrada); has no specific action on the liver."

Chomomile. This drug appears in the latest edition of the National Formulary under the title Matricaria and is said to be "popularly used as a bitter, an aromatic tea or a poultice; effects, if any, are due mainly to hot water."

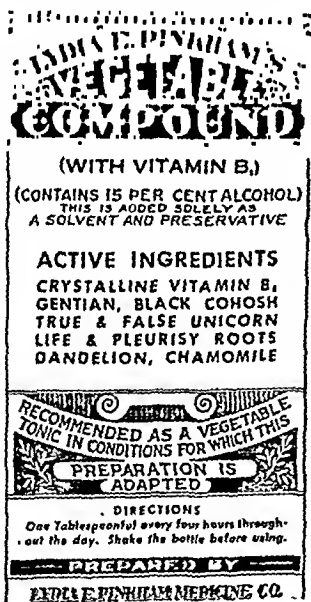
With the exception of the crystalline vitamin B₁, therefore, it is not even necessary to know the quantity of the ingredients to surmise that the Compound is not of any established value beyond whatever virtues may be attributed to the various bitters.

The failure to establish any value scientifically, however, does not seem to have much effect on the current advertising for this preparation. Here reproduced is a recent advertisement entitled "Women in Your 40's Need Not Lose Charm!" The implica-

1. Italics ours.



The label which is reproduced above appeared on a bottle purchased in the early part of 1939. The label reproduced at the right is even more recent, and declares all of the active ingredients, in accordance with the Federal Food, Drug and Cosmetic Act.



tained the statement that the preparation was "Recommended as a Vegetable Tonic in Conditions for Which This Preparation is Adapted." As Dr. Arthur J. Cramp pointed out in an article in Hygeia "This statement is about as informative as it would be to say that 'For Those Who Like This Sort of Thing, This Is the Sort of Thing That Those People Like.'"

According to Section 502(c) of the Federal Food, Drug and Cosmetic Act a drug shall be deemed to be misbranded:

"If it is a drug and not designated solely by a name recognized in an official compendium unless its label bears (1) the common or usual name of the drug, if such there be; and (2) in case it is fabricated from two or more ingredients, the common or usual name of each active ingredient, including the quantity, kind, and proportion of any alcohol, and also including whether active or not, the name and quantity or proportion of any bromides, ether, chloroform, acetanilid, acetphenetidin, amidopyrine, antipyrine, atropine, hyosine, hyoscyamine, arsenic, digitalis, digitalis

tion is that this Compound will prevent, or at least alleviate, the symptoms of the menopause. Scientifically the modern effective method of treating such symptoms is to supply the deficient hormone, which, of course, is not contained in this Compound.

WOMEN IN YOUR 40's

Need Not Lose Charm!

Here's good advice for a woman during her change (usually from 38 to 52), who fears she'll lose her appeal to men, who worries about hot flashes, loss of pep, dizzy spells, upset nerves and moody spells.

Just get more fresh air, 8 hrs. sleep and if you need a reliable "WOMAN'S" tonic take Lydia E. Pinkham's Vegetable Compound, made especially for women. It helps Nature build up physical resistance, thus helps give more vivacity to enjoy life and assist calming jittery nerves and those disturbing symptoms that often accompany change of life.

For free trial bottle tear this out and send with name and address to Lydia E. Pinkham Medicine Co., 973 Cleveland St., Lynn, Mass.
Pinkham's is WELL WORTH trying.

Lydia E. Pinkham's
VEGETABLE COMPOUND

There is not an iota of scientific evidence to support the recommendation of this mixture for the treatment of the symptoms of the menopause. It remains to be seen just what limits will be placed on this type of advertising in the near future. Progress has been made, but still more progress is necessary if the public is to be protected against the blandishments of "patent medicine" promoters.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DIAGNOSIS AND TREATMENT OF TABES

To the Editor:—1. What are the minimal manifestations on which a diagnosis of tabes dorsalis can be made? 2. Is an untreated tabes with negative spinal fluid a burned out tabes that requires no treatment? 3. What are the criteria for cessation of treatment in a case of tabes?

M.D., New York.

ANSWER.—1. It is difficult to say what are the minimal manifestations which would justify a diagnosis of tabes dorsalis. It would be well to have a positive spinal fluid associated with some pupillary changes and diminution of the deep tendon reflexes of the lower extremities. In the absence of a positive spinal fluid there should certainly be definite evidence to physical examination of disease of the posterior nerve roots in a patient diagnosed as having syphilis. The Cooperative Clinical Group (*Arch. Dermat. & Syph.* 38:692 [Nov.] 1938) lists the following subjective and objective symptoms as of diagnostic value: diplopia, neuritic pain, reduced libido and potentia, gastrointestinal or laryngeal crises, paresthesia of the hands and feet, headache, dizziness, vertigo, ataxia, failing vision, incontinence, girdle sensation, Argyll Robertson pupils, fixed pupils, irregular pupils, anisocoria, reduction of the deep reflexes, reduction of pain sense, hyperesthesia, heat and cold changes, ataxia and incoordination.

2. It would be unwise to consider an untreated tabes with a negative spinal fluid as a burned out tabes. Such a patient should be submitted to at least the minimum standard treatment for the cure of syphilis, as advised by the Cooperative Clinical Group, provided age and physical condition will permit.

3. The age of the patient, his symptoms and the benefits derived from treatment should be used as criteria in determining the duration of treatment for tabes. The Cooperative Clinical

Group survey mentioned has shown that routine therapy in the form of at least two courses of arsphenamine of eight injections and from twelve to fifteen injections of a bismuth preparation will reverse the reaction of the spinal fluid in many cases of tabes dorsalis. When examination of the spinal fluid shows that treatment as just described has not made any material change in the spinal fluid and where there is no material improvement in the clinical aspects of the disease, the patient should be given the advantage of supplemental or auxiliary treatment. If the routine is to produce the most satisfactory result, it must consist of more than twenty injections of arsphenamine and twice as much of a bismuth preparation. Intraspinal therapy is most efficient when a minimum of seven intraspinal treatments is given in conjunction with the routine treatment. When tryparsamide is employed, at least thirty injections of tryparsamide and thirty injections of a bismuth preparation should be given to a course, although the most satisfactory results are noted among patients who receive 100 or more injections each of tryparsamide and of bismuth preparations. If malaria therapy is used, a patient should undergo not less than eight "chills" or satisfactory rises of temperature.

NEPHRITIS AND PREGNANCY

To the Editor:—A primipara aged 28 was first seen in January 1938 with a three and one-half months gestation and no abnormalities on physical examination. The blood pressure was 125/75. In February it was 155/85 and in April 194/110 with 2 plus albumin in the urine, no casts, but occasional white cells. With bed rest and sedatives the blood pressure dropped to 165/90 but soon rose again. Finally the urine showed 4 plus albumin (end of May) and she was brought to a hospital and labor was induced by insertion of a Vorhees bag. While the bag was expelled, the cord prolapsed. Version and extraction of a 5½ pound (2,500 Gm.) baby could not save its life. The patient had a thrombophlebitis with uneventful recovery. Two months after delivery her blood pressure was 140/90, the urine was normal and she felt fine. At no time was there headache or precordial distress—only edema of the face and legs. She is anxious to know whether she could have another baby and when. Would two years' waiting have any bearing on a recurrence during the next pregnancy? Provided the blood chemistry is negative at present and kidney function tests (Mosenthal and phenolsulfonphthalein) good, could pregnancy be contemplated at once or never at all? M.D., Minnesota.

ANSWER.—The clinical history presented is typical of pre-existent renal disease exacerbated by pregnancy. A true "low reserve kidney," such as this case presents, is perhaps the most significant of all the forms of renal and hypertensive disorders found in obstetric medicine. It is the type most frequently ignored until irreparable damage is done. The nephritides as they occur in pregnancy are best classified under four groups: type A, the simple nephrosis of pregnancy; type B, eclampsia or eclamptic intoxication; type C, pre-existent renal and/or hypertensive disease exacerbated by pregnancy, and type D, coincident nephritis. Type A is characterized by a relatively late onset, profuse proteinuria, moderate hypertension, a good immediate prognosis and remarkably rapid and complete recovery after the termination of pregnancy. Eclampsia need not be discussed here. Coincident nephritis includes that small group of cases in which nephritis occurs in pregnant women for etiologic reasons wholly independent of the pregnant state: acute infective nephritis; mercury bichloride nephrosis, and so on (Adair, F. L., and Stieglitz, E. J.: *Obstetric Medicine*, Philadelphia, Lea & Febiger, 1934, chapter XXVIII).

Pre-existent nephritis, such as unquestionably existed in the present case, is frequently unrecognized and silent until the increasing stresses and renal burden of pregnancy precipitate evidences of renal incompetence. The term "low reserve kidney," if strictly applied, obviously described just such a situation. The renal functional capacity is adequate for the ordinary load of renal work, but there is depletion of the reserve for the extra effort involved in the secretion of the greatly augmented metabolic debris of pregnancy. These stresses and other factors then incite an exacerbation of the renal injury. It is most important to keep in mind that much of the exacerbation of the renal injury persists permanently after the pregnancy in these cases. The renal functional reserve is usually notably lower after such an experience than before. Thus the risk in future pregnancies becomes increasingly great and the likelihood of obtaining a living infant increasingly remote.

Characteristic of this type of nephritis is the onset of hypertension early in the pregnancy. A useful and practical axiom is that the earlier in pregnancy hypertension and/or proteinuria appear the lower is the renal reserve. The longer such pregnancies continue, the greater the irrevocable renal damage and the poorer the ultimate prognosis for the patient. In those carried to fetal viability, or as long as possible, the future course

is usually downhill. Rapidly progressive hypertensive arterial disease is frequently initiated by pregnancy in these women. In such the prognosis is poor. Fetal mortality is close to 60 per cent even with the most conservative management.

It is notable that two months post partum this patient still has a borderline hypertension of 140/90 (age 28). The absence of protein from the urine is an utterly worthless criterion of her renal functional capacity. So also would be a present "negative blood chemistry" (blood constituents at normal concentration). Increases in the concentration of the nonprotein nitrogenous metabolites in the blood occur only when actual renal decompensation exists. The patient's renal function appears to be adequate at present (under the present loads) but the depleted reserve would permit of renal failure if and when the load is increased, as with another pregnancy. Only careful evaluation of the patient's renal function reserve can tell what her margin of safety is. Stress tests such as the concentration procedure are of greater value here than the phenolsulfonphthalein or urea clearance tests.

The decision to deprive a woman of the privilege of bearing children must never be taken lightly. Therefore great care and thorough study are required before such questions can be adequately answered. In the present instance the following suggestions appear warranted: 1. Careful evaluation of the patient's renal functional reserve at the present time. 2. Frequent observation of her arterial tension for a year or more. It may rise gradually. If so, future pregnancies would be of suicidal precariousness. 3. Attention to foci of infection, general health, nutrition, and especially to the hemoglobin content of the blood. Anemia, even of minor degree, is a potent factor in retarding the rehabilitation of injured tissues and especially damaged kidneys. 4. A cold pressor test to determine the patient's arteriolar excitability. Such a test may give valuable prognostic information. 5. Reevaluation of the renal function after twelve to eighteen months. 6. Frequent antepartum observation. If a second pregnancy does occur, this is imperative from the beginning. Should the arterial tension again rise and proteinuria appear, particularly if these occur earlier in the second pregnancy than in the first, therapeutic termination of pregnancy would be justified. After that, further attempts must be urgently discouraged.

TREATMENT OF TAPEWORM

To the Editor:—Will you please give me information regarding any recent, or the best, method and technique in the management of a patient with a tapeworm. I should like to have this information in connection with both the drug and the method of use. A girl aged 5 years, first observed almost a year ago, had been underweight for several months and just prior to that time her mother had noticed several large segments of tapeworm in her stool. She was admitted to the hospital and given routine treatment for tapeworm, the standard amount of oleoresin of aspidium being given for her age. Each time she expelled large sections of the worm—approximately 20 feet with each treatment. The head of the worm was never found in the stool but twice segments of the worm were identified which must have been immediately at the head. The third and last treatment was given about four months ago. As after each of the other treatments she improved for about three months. A few days ago after the administration of a mild purgative she expelled large segments of tapeworm.

J. S. HOLBROOK, M.D., Statesville, N. C.

ANSWER:—Oleoresin of aspidium is the drug of choice for treatment of the beef tapeworm (*Taenia saginata*) and the pork tapeworm (*Taenia solium*). The lengths of worm evacuated by the patient after medication and the relative rarity of the pork tapeworm in the United States indicate that one is here dealing with *Taenia saginata*. For effective treatment the drug must be fresh and must be preceded and followed (or accompanied) by saline purgation.

On the day before treatment the patient should be placed on a semiliquid diet and before retiring should be given one-half ounce (15 Gm.) of sodium sulfate or magnesium sulfate dissolved in a glass of water. Sodium sulfate is preferred because it dissolves mucus away from the head of the worm and thus allows the anthelmintic to act more efficiently. The disagreeable taste of the purgative may be partly disguised by adding to it the juice of half a lemon. On the morning of treatment the patient remains in bed and takes no food. The oleoresin of aspidium is prescribed in three divided doses, to be taken half an hour apart. Each of the three doses should not exceed 20 minims (1.3 cc.) for an adult or 10 minims (0.65 cc.) for a child of 5 years. This medication is followed in one or two hours by saline purgation, similar to that taken the night before treatment. The patient may have food as soon as copious bowel movements have been obtained.

A satisfactory alternative treatment consists in transduodenal intubation of the anthelmintic. The patient is prepared for treatment as indicated. On the morning of treatment the tube

is directed into the duodenum under a fluoroscope, after which an emulsion of the following composition (calculated for a child of 5 years), is slowly introduced: oleoresin of aspidium 40 minims (2.6 cc.), mucilage of acacia 20 cc., saturated solution of sodium sulfate 20 cc. No post-treatment purgation is required.

Both of the prescriptions mentioned are usually successful in dislodging and evacuating the heads of tapeworms.

GRANULOCYTOPENIA AND MALARIA

To the Editor:—I should appreciate your assistance in securing some information about the occurrence of agranulocytosis in malaria. I found two references in the German literature. Both refer to cases of malaria which followed malarial therapy for dementia paralytica. Here, however, the picture is slightly obscured by the prior administration of arsenicals and bismuth. Do you know of any reports of agranulocytosis in malaria?

SIDNEY LEIBOWITZ, M.D., New York.

ANSWER:—There are no well authenticated instances of agranulocytosis developing during the course of untreated malaria. Although malaria in some patients may be accompanied by a mild or moderate temporary leukopenia, usually the differential count is unaffected. More often there may be a leukocytosis, especially in the more acute forms of the disease.

It should be pointed out, however, that agranulocytosis has been reported after the administration of certain antimalarial therapeutic agents. Thus quinine has been reported to be causative in several instances (Vitug, W.; Chavez, A., and Austria, G. F.: *J. Philippine Islands M. A.* 15:464 [Sept.] 1935. Groen, J., and Gelderman, C. J.: *Nederl. tijdschr. v. geneesk.* 78:344 [July 28] 1934. Dassen, R., and Fong, E.: *Rev. Assoc. med. argent.* 49:1077 [Aug.] 1935. Corelli, F.: *Hematologica* 15:663, 1934) while plasmochin apparently produced complete disappearance of granulocytes in one patient (Knighton, J. E., Jr.: *New Orleans M. & S. J.*, p. 755, 1935).

In instances of malarial therapy for dementia paralytica in which arsenical compounds have been administered previously, it would be quite difficult to assume the leukocyte depression to be caused by the malaria, since it is well established that the arsenicals may produce agranulocytosis in occasional instances. Plum having summarized fourteen such cases (Plum, Preben: *Clinical and Experimental Investigations in Agranulocytosis*, London, H. K. Lewis & Co., 1937, p. 101). Furthermore, in occasional instances the action of the arsenicals on the bone marrow may be delayed and apparently cumulative.

In order to assume the development of agranulocytosis after infection with malaria, it would be necessary to rule out the use of therapeutic agents such as those mentioned, and if such agents have been used in the immediate past prior to development of agranulocytosis the disease most likely would have resulted from them rather than from the malaria.

EPISTAXIS

To the Editor:—Acting as an interpreter at a series of Red Cross first aid lectures, the lecturer spoke on epistaxis. He stated that when one sits bleeding from the right side, the base of the left ring finger should be bound tightly with a string for a while, and vice versa for bleeding from the left side. The next evening an opportunity to prove his statement was presented. The patient was bleeding from the left side. On tying the right ring finger at its proximal portion of the phalanx, I controlled the epistaxis easily and promptly. Can you suggest any basic reason for this? Is there any literature on this subject?

M. PAUL SUZUKI, M.D., Seattle.

ANSWER:—Cases of epistaxis may be conveniently divided into three groups. There is the extremely severe case encountered in surgery of the nose, in malignant growths or as an accompaniment of certain cardiovascular conditions. This group is characterized by a single, profuse hemorrhage. The second class would be cases that are characterized by repeated, moderately severe hemorrhages. These patients frequently have been treated by all the popular home remedies and by at least a half a dozen surgical procedures. Because of a slight ulceration in the nose or of some unusual permeability of the blood vessels, the bleeding occurs with every slight trauma. The third group is bleeding from epistaxis of this character are almost as numerous as the procedures treasured by the public for the removal of the common wart. The self-limiting character of this group of cases gives an apparently high incidence of cures to any of the popular methods. There is no known basis of an anatomic or physiologic character that would explain the cessation of the epistaxis as described in the query.

The therapeutic scheme here described seems to be a recrudescence with slight modification of "zone therapy," which had a vogue from about 1915 to 1920. Popular articles appeared in *Everybody's Magazine*, *Associated Sunday Magazines* and *Every*

Week. In the latter publication, Bruce Barton spoke approvingly of the method. Fitzgerald seems to have been the prominent exponent of this so-called system. In "Zone Therapy or Relieving Pain and Disease" by Drs. William H. Fitzgerald and Edwin F. Bowers (Columbus, Ohio, I. W. Long, 1918) the physician is advised for epistaxis to apply strong constriction to the base of the thumb and index finger of the affected side or in severe cases to apply constriction about all the digits of both hands. Special rubber and metal constricting rings were available in this work. An alphabetical therapeutic index is furnished which tells how to relieve angina pectoris, produce anesthesia, cure asthma, lower blood pressure, raise blood pressure, cure bronchitis, cure brachial neuritis, relieve constipation and so on through the alphabet to writers' cramp and wry neck—all by constricting or pinching the proper fingers and toes. *American Medicine* (November 1921) carried an article by Dr. Fitzgerald on "Zone or Pressure Therapy." In the editorial column it was pointed out that only time would tell the value of this procedure. Time has established its worthlessness.

NURSE AS CARRIER OF AMEBAS

To the Editor:—1. Is it compatible with safety for a nurse having a stool positive for *Endamoeba histolytica* (cysts) to be on duty in a general hospital? 2. If excluded from duty, how long should the stool and symptoms be free before it is safe for her to return? 3. Are there any other suggestions?

M.D., Oklahoma.

ANSWER.—1. It is safe for a nurse having a stool positive for *Endamoeba histolytica* to be on duty in the general hospital if she has the knowledge to care for her hands competently so as to prevent any possibility of transfer of the infection to others. This entails keeping the nails well trimmed and careful washing of the hands with soap and water immediately after going to the toilet, as well as at any other time when they may have become contaminated.

2. If the nurse is excluded from duty, she should have three negative stool examinations and be free from symptoms for a week before she is allowed to return. As a rule, however, with the proper care, exclusion of a nurse who is an *Endamoeba histolytica* carrier from duty is not required.

3. The same regulations should apply to a nurse as to a food handler infested with *Endamoeba histolytica*.

DETERMINATION OF VITAMIN B₁ BY FLUORESCENCE

To the Editor:—A few weeks ago I saw a clipping to the effect that some one had invented an instrument for the detection and determination of amounts of vitamin B₁ in substances. The principle of the instrument as I recall, was based on the use of the photoelectric cell in some manner. I would greatly appreciate any information concerning such an invention.

M.D., Missouri.

ANSWER.—Presumably the method to which reference is made is that of converting vitamin B₁ (thiamin) into thiochrome by oxidation with alkaline potassium ferrieyanide, as originally suggested by Jansen. The resulting thiochrome is extracted from the aqueous solution with isobutanol and quantitatively estimated by the blue fluorescence which its solution exhibits in ultraviolet light. Several other workers have endeavored to perfect the method, so that at the present moment it promises a somewhat higher precision than any other chemical test.

D. J. Hennessy and L. R. Cerecedo published in the January 1939 issue of the *Journal of the American Chemical Society* some modifications of the method tending to adapt it for use in the assay of a variety of biologic fluids and tissues. They also provide for distinguishing free thiamin from its pyrophosphate (cocarboxylase) and give complete references to the earlier literature.

LEUKOPLAKIA IN YOUNG WOMAN

To the Editor:—A woman about 24 years of age has a rather extensive case of leukoplakia. The dentist and I are doing everything possible to correct any possible cause. It seems stationary but is certainly persistent. Is there anything new that can be recommended? The patient appealed to me recently pleading for cure. She is engaged to be married in May.

WARREN T. McNEIL, M.D., Stockton, Calif.

ANSWER.—In the majority of cases of leukoplakia buccalis no ill effects occur. While leukoplakia is regarded as precancerous, a malignant change need not necessarily follow even after many years. Therefore in most instances no radical treatment need be considered. Of course, the patient's mouth should be inspected at intervals of six months to apprehend any unfavorable changes in the lesions.

There should be an investigation as to the presence of syphilis, which should receive standard treatment if present. Some investigators state that in fully 50 per cent of patients with leukoplakia there is a background of syphilis. Otherwise the patient should not smoke at all. The food should not be highly

spiced, very hot or cold. Soothing applications may be made to the lesions, such as tincture of myrrh. Silver nitrate crayons may be used on fissures and erosions, but great care should be taken not to stimulate an already present epithelioma by such superficial caustic applications. Acid mercuric nitrate has been much used, but its action must be strictly confined to the lesions. For focal thickenings and irregularities the cautery is best. If a malignant change takes place in any of the lesions, it is treated the same as cancer of the mouth otherwise.

In a patient as young as this woman, leukoplakia is unusual. One should use care to make sure that she does not have lichen planus limited to the mucous membranes, instead of leukoplakia.

TRAUMA AND PAIN UNDER RIBS

To the Editor:—An employee of an oil company fell against a pipe, striking the left lower part of the chest. He complained of intense pain located deep in and under about the ninth and tenth ribs in front. X-ray examination showed that no ribs had been fractured. The pain lasted for about one month but gradually became less intense and finally subsided entirely. There were no abdominal symptoms. Please advise as to the possible causes of this pain. What is the most probable cause? I have been unable to find anything in any books which I have regarding injury of the spleen except rupture. Could a congestion or swelling of the spleen put tension on its capsule and account for such a pain?

C. L. PEARCY, M.D., Salem, W. Va.

ANSWER.—Several possibilities present themselves as explanations of the pain in this case. The contusion of the spleen without actual rupture of the capsule is certainly a strong possibility. It is certainly likely that minor ruptures or tears in the capsule with a small amount of bleeding do occur and heal without anything further being done. Second, rupture of the diaphragm has to be considered; third, a minor injury to the left lobe of the liver with a crack in the capsule and a small amount of bleeding or a localized contusion without bleeding. Fourth, a contusion of the lung on the left side has to be considered; fifth, a contusion involving the heart with effusion of blood in the pericardium with gradual absorption. The fact that the pain has gradually disappeared would seem to indicate that no further treatment is necessary. However, the literature contains many cases of ruptures of the spleen coming on secondarily a month or more after the primary injury has weakened the capsule.

SPINAL FLUID WASSERMANN FAST NOT DESIRABLE TERM

To the Editor:—It is well known that in some cases of syphilis that have had adequate treatment, the blood may be "Wassermann fast." In a case presenting a 4 plus Wassermann (blood) reaction and 4 plus spinal fluid Wassermann reaction and a negative colloidal gold test with no increase in spinal fluid globulin or cell count, is it possible to consider the patient as being "spinal fluid Wassermann fast"? He has had two years of continuous treatment alternating bismuth compounds and neocarsphenamine. Since the spinal fluid was examined six months ago he has received twenty injections (3 Gm.) of tryparsamide and ten malaria chills with no effect on the spinal fluid Wassermann reaction. Clinically he is asymptomatic, and careful systemic and neurologic examinations on several occasions have been completely negative. Can one speak of "spinal fluid Wassermann fast" as well as "blood Wassermann fast"? If so, what is the relative frequency? I would appreciate any information that you can give me.

M.D., New York.

ANSWER.—The use of the term "Wassermann fastness" is deprecated because it implies a clinical state, whereas in reality it is nothing but a group of serologic reports. In practically all patients who have "Wassermann fast" blood tests some explanation can be found for the Wassermann fastness in the fact that the patient either has neurosyphilis or cardiovascular syphilis and only in a few is there no definite explanation to be offered as a result of thorough clinical examination or examination of the spinal fluid. Occasional patients with neurosyphilis are seen in whom the flocculation or complement fixation test on the spinal fluid will remain positive while all other tests on the spinal fluid are negative. This type of report may or may not be of significance as it is frequently seen in patients who, when treatment is stopped, will immediately relapse in the spinal fluid to strongly positive in all factors. On the other hand, it is frequently seen in patients with tabes dorsalis in whom the fixation or complement fixation on the spinal fluid will be positive for years while all other factors on the spinal fluid will remain persistently negative. In the case under discussion, sufficient time has not as yet elapsed to make deductions with regard to the significance of the positive flocculation test on the spinal fluid, as the last spinal fluid test was done only six months ago. As a rule significant changes in the spinal fluid will not be noted for at least two years following the fever course. In the interim it would seem advisable to continue with treatment and in the case under discussion tryparsamide and a bismuth compound or arsphenamine and a bismuth compound

should be given approximately at the rate of two courses a year for the two ensuing years, at least. This implies, of course, that the term "spinal fluid Wassermann fast" should not be adopted because, although experience with spinal fluids is not great enough as yet to attach concrete significance to such a finding, it would appear that several years of observation after intensive treatment has been stopped should be employed before endeavoring to make any deductions as to the significance of this type of spinal fluid.

DERMATITIS FROM CARBON DISULFIDE

To the Editor:—Will you kindly state whether or not it is possible to develop a skin lesion when one has been mildly poisoned by the fumes of carbon disulfide? If this should be possible, what kind of a lesion would develop? I have a patient who says that he became quite ill while handling the chemical and developed patches on the arms and body which were about the size of a silver dollar and are of a brownish color and slightly scaly. Could this chemical produce such a lesion?

H. W. JONES, M.D., Bakersfield, Calif.

ANSWER.—Carbon disulfide (CS_2) usually causes dermatitis at the point of contact. The lesions usually are characterized by erythema, vesicles and degenerative changes in the local peripheral nerves resulting in impaired sensation. Carbon disulfide is a vesicating agent acting chiefly as a fat solvent. Prolonged contact with the skin will cause manifestations characteristic of second and third degree chemical burns. Exposure of the skin to dilute solutions or vapors may cause a drying of the skin as a result of the solvent action on the fats and the cooling effects of evaporation. These lesions may affect whatever parts come in contact with the vapors or fumes. As the lesions heal there may be a residual pigmentation.

Splashes of the chemical on the clothes of the patient may have caused lesions which after healing may have resulted in such patches as those described. If the patches were not the result of healed eczematous lesions, it can be said that they were not caused by carbon disulfide. Pityriasis rosea, fixed drug eruptions such as may be caused by phenolphthalein, patches of parapsoriasis and other similar cutaneous conditions must be considered.

UNDESCENDED TESTIS

To the Editor:—A boy aged 5 years has one testis in the scrotum and the other still in the inguinal canal, though it can be brought down with mild traction. The testis that is in the inguinal canal is considerably smaller than the one that has descended. Would treatment with anterior pituitary-like substance be indicated?

M.D., Illinois.

ANSWER.—The probabilities are that if the testis can be brought down into the scrotum by mild traction it will descend before or at puberty. The whole question involved is therefore whether or not it would be better to have the testis constantly in the scrotum at an earlier period than it would be by "watchful waiting." From experimental evidence it would appear that, the earlier the testes are brought into the scrotum after birth, the more normal they are likely to be. Therefore it would perhaps be best to give this particular boy a short period of treatment using 200 to 300 rat units of gonadotropic substance four times a week for a period of from five to six weeks. If there is any indication of an increase in the size of the external genitalia, the treatment should be discontinued as soon as this is recognized.

HEAT PROSTRATION AND SINUSITIS

To the Editor:—Are there any reports of sinusitis (especially maxillary) following heat prostration? If there are please give me some information on the cases and if possible some literature to read on the subject.

E. H. COACHMAN, M.D., Muskogee, Okla.

ANSWER.—A search of the literature for the past ten years and standard textbooks on rhinology fails to reveal any information on sinusitis following heat prostration.

ANTITYPHOID VACCINE

To the Editor:—Some time ago I noticed that the army had discontinued using paratyphoid A and B for vaccine, using simply *Bacillus typhosus*. Is this a generally accepted plan? I note that the majority of the biologic companies are still using the old formula which contains paratyphoid A and B.

W. S. CRAWFORD, M.D., Tulsa, Okla.

ANSWER.—The antityphoid vaccine now used by the army is being used more and more widely, but vaccine made according to the old formula is used also. All antityphoid vaccines on the market are tested for antigenic values and are approved by the U. S. Public Health Service.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, May 13, page 1991.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical centers having five or more candidates desiring to take the examination, June 19-21 and Sept. 11-13. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th Street, Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. *Written.* Various places throughout the United States, Sept. 9. Applications must be filed by July 11. *Oral.* Part II. Philadelphia, Oct. 14-15. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: Philadelphia, Oct. 30-Nov. 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various sections of the United States, Oct. 16 and Feb. 19. Formal application must be received before Aug. 20 for the Oct. examination and on or before Jan. 1 for the Feb. examination. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various cities of the United States, Puerto Rico and Canada and in Honolulu, Aug. 5. Application must be received before July 1. *General Oral.* Chicago, Oct. 7. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis, Mo.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Boston, January. Sec. Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 6-7. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Cincinnati, Nov. 15. Appointments must be made before July 15. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF UROLOGY: White Sulphur Springs, W. Va., May 26-28. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Alabama January Examination

Dr. J. N. Baker, secretary, Alabama State Board of Medical Examiners, reports the written examination held at Montgomery, Jan. 3-5, 1939. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. The following school was represented:

School	PASSED	Year Grad.	Per Cent
Tulane University of Louisiana School of Medicine.....	(1938)		85.2

Nevada Reciprocity and Endorsement Report

Dr. John E. Worden, secretary, Nevada State Board of Medical Examiners, reports three physicians licensed by reciprocity and one physician licensed by endorsement after an oral examination held at Carson City, Feb. 6, 1939. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of California Medical School.....	(1927)		California
State University of Iowa College of Medicine.....	(1926)		Minnesota
Jefferson Medical College of Philadelphia.....	(1920)		California

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad.	of
Stanford University School of Medicine.....	(1938)		N. B. M. Ex.

Hawaii January Examination

Dr. James A. Morgan, secretary, Board of Medical Examiners, Territory of Hawaii, reports the oral and written examination held at Honolulu, Jan. 9-12, 1939. The examination covered ten subjects and included eighty questions. An average of 75 per cent was required to pass. Four candidates were examined, three of whom passed and one failed. Four physicians were licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of California Medical School.....	(1934)		82.1
University of Colorado School of Medicine.....	(1931)		82.4
Washington University School of Medicine.....	(1937)		80.8

School	FAILED	Year Grad.	Per Cent
Nippon Ika Daigaku, Tokyo.....	(1937)		59

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad.	of
Yale University School of Medicine.....	(1931), (1935)		N. B. M. Ex.
Northwestern University Medical School.....	(1937)		N. B. M. Ex.
Johns Hopkins University School of Medicine.....	(1935)		N. B. M. Ex.

Book Notices

Scarlet Fever. By George F. Dick, M.D., D.Sc., Professor of Medicine, University of Chicago, and Gladys Henry Dick, M.D., D.Sc. Cloth. Price, \$2. Pp. 149, with 8 plates. Chicago, Illinois: Year Book Publishers, Inc., 1938.

Containing a concise account of the application of the investigations of the authors to the prevention and treatment of scarlet fever, this book summarizes their articles on these matters during the past twenty years or more. The demonstration by human experiments on the part of the authors that scarlet fever may be caused by hemolytic streptococci was followed by the discovery of a specific streptococcal scarlet fever toxin, which in turn led to the Dick test for susceptibility to scarlet fever, to successful active immunization against scarlet fever and to the use in treatment of a specific antitoxin. The book describes the practical use of these measures and the results obtainable. The preparation of the scarlet fever toxin and the technic of testing its potency are described in detail. The book is a landmark in the history of scarlet fever.

Pyréthérapie. Par Charles Richey, professeur agrégé à la Faculté de médecine de Paris, Jean Surmont, médecin électro-radiologiste des hôpitaux de Paris, et Pierre Le Gô, électro-radiologiste des Asiles de la Seine. Paper. Price, 50 francs. Pp. 195, with 28 illustrations. Paris: Masson & Cie, 1938.

This is the first monograph on pyretotherapy, or artificial fever, to appear in French. The authors divide their thesis into five main chapters entitled biologic principles, technic, clinical results, pathogenesis of pyretotherapy and conclusions. They conclude that there is a direct relationship between body temperature and inhibition of the growth of certain micro-organisms, especially the gonococcus and *Spirochaeta pallida*. This bactericidal action of heat can be demonstrated in vitro and in vivo, though it is more pronounced in vivo. They state that this may be due to the well known acceleration of most chemical reactions under the stimulating influence of heat. They further conclude that the source of the fever makes little difference, that the micro-organisms are destroyed in vivo at temperatures compatible with life and that fever modifies human physiologic reactions to a profound degree.

The second and longest chapter of the book discusses the production of fever. Inoculation with malaria and the production of relapsing fever and of sodoku, or rat bite fever, are described, with their advantages and disadvantages. In the section on the use of suspensions of killed micro-organisms, the action of emulsions vaccine, consisting of an emulsion of the Duersey bacillus, which is more widely used in France than in the United States, is described in detail. The authors conclude that this vaccine presents the advantages of a quick rise of the febrile curve and the possibility of predetermining the amount of fever, since the dose is proportional to the amount of the vaccine injected. They are less pleased with typhoid, gonococcus, paracoli and yeast emulsions as well as bacterial proteins, such as tuberculin. Chemicals for producing fever are also mentioned, such as milk, sodium nucleinate, nucleoprotein, turpentine and benzene. The authors conclude that colloidal solutions of silver and suspensions of sulfur in oil are the only chemicals that are really practical. The rest of the chapter is devoted to a thorough discussion of the physical methods of elevating the temperature. An error is the statement that it is difficult to raise the temperature of the human body above 40 C. (104 F.) by means of damped diathermy waves. The discussion on external heating contains a brief description of the various wavelengths and their frequency, clarified by a useful chart. The section dealing with the machines used for producing short radio waves is comprehensive and clear. Naturally French machines occupy the foreground, but this is to be expected in a book intended for French physicians. A new pyrometer constructed by Le Gô seems to be better than the instruments in common use in the United States. Accidents such as burns, heat stroke and involvement of the cardiovascular system are dealt with in detail. The authors distinguish between the effect of active and of passive pyretotherapy. The former is produced by the body itself as a result of inoculations or injections and the

latter by transferring energy into the body. They liken active pyretotherapy to shock. Finally the contraindications of treatment are ably discussed in detail.

The third chapter, dealing with the clinical results of pyretotherapy, is clear and comprehensive and illustrated with frequent case reports. The results achieved in the treatment of gonorrhea and all its complications, primary and secondary syphilis, syphilitic optic atrophy, tabes, cerebrospinal syphilis and dementia paralytica are discussed in detail. The authors then describe the treatment of chorea minor, encephalitis, Parkinson's syndrome, multiple sclerosis, poliomyelitis, psychoses and other psychiatric conditions, cardiovascular diseases, gout, arthritis, articular rheumatism, neuritis, asthma, soft chawere, diseases of the ears, nose and throat, staphylococcal infections, tuberculosis, ocular diseases, renal diseases, undulant fever, meningococcal meningitis, diseases of the lungs, dermatoses, obesity, carcinoma and mycosis fungoides. It is a great credit to the book that this widely divergent material dealing with therapeutic results is carefully analyzed and classified. The point of view is always conservative and no overstatement is made. Whenever the clinical results are doubtful or valueless the authors state this fact frankly and openly.

The two short final chapters contain the authors' theories on the reasons for the benign action of fever, either active or passive, on diseases as well as their own conclusions about the application of this therapy. Finally there is a bibliography of less than 150 references, which is not nearly complete, since the world literature on artificial fever alone now comprises more than 500 contributions. There is no index.

In spite of the minor defects mentioned the book is an excellent contribution to pyretotherapy. It fills a real need as a volume for reference, from which the physician can learn the technic of fever production as practiced in the United States and abroad.

Textbook of Neuro-Anatomy and the Sense Organs. By O. Larsell, Ph.D., Professor of Anatomy, University of Oregon Medical School, Portland. Cloth. Price, \$6. Pp. 343, with 232 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1939.

Olof Larsell has presented a well organized, orthodox discussion of the structure, both gross and microscopic, of the central, peripheral somatic and sympathetic nervous systems. Sufficient physiologic and clinical data have been appended to enhance the student's interest in the subject and to indicate the more important correlations between structure and function. Although the "book has been written primarily for the first year medical student" and is accordingly not encyclopedic, it will prove of value and interest to many more advanced students. This is particularly true of the chapter dealing with the cerebellum and pons, a subject to which the author has been a noteworthy contributor. The discussion of the various end organs, cutaneous, tendinous and muscular, as well as the organs subserving specialized sensations, such as the taste buds, the olfactory epithelium, the retina, the vestibular apparatus and the cochlea, is a valuable addition to the discussion of the nervous system.

Unfortunately the text is neither always clear nor easily read; there are not a few errors which it is hoped will be corrected in future editions. On page 259 in the second paragraph from the bottom the statement of fact is literally correct but the meaning implied is false. One would conclude that, whereas Poljak and Brouwer found no optic fibers from the pulvinar to the calcarine cortex, Walker and Le Gros Clark did. This is not correct. The fibers found by Walker and Le Gros Clark were not to the calcarine cortex (area 17) but to other parts of the occipital lobe and were not regarded as optic fibers. The statement on page 97 that "special visceral efferent fibers arise from the motor VII nucleus and pass through the motor branches of the VII nerve to the mimetic muscles, derived from the musculature of the hyoid arch" is hardly designed to inform first year medical students that the seventh cranial nerve innervates the muscles of the face. The discussions, principally on pages 76 to 81, relative to the pathways subserving the sensations of touch and of pain are confused and even contradictory. On page 78 one finds the implication that the ventral spinothalamic tract alone carries the sensations of touch and pressure in the statement that destruction of that pathway abolishes the perception of such stimuli. There are other pathways for touch and pressure sensibilities in the posterior and lateral columns accord-

ing to page 80 and in the posterior and ventral columns according to page 90, and the further contradictory statement that the posterior columns have to do only with joint and position sense and with two point discrimination appears on page 79. On page 80 is found the erroneous statement that the destruction of the anterior white commissure of the spinal cord results "in loss of pain and temperature sensation on the opposite side of the body below the level of the lesion." The omission of the important spinothalamic tract from figures 90, 92 and 94, as well as others, is noteworthy. In the discussion of the afferent components of the glossopharyngeal nerve (page 95) all mention of the fibers of the carotid sinus nerve and of the tympanic nerve has been omitted, and the statement that the general somatic afferent fibers of this nerve are "distributed to the skin of the back of the ear and mastoid region" is at least open to question. In the legend to figure 19 the letters b and l have surely been interchanged. The statement on page 81 that the spinothalamic tract is "apparently a correlation pathway" is meaningless and needs clarification. In spite of evidence (Stern) that the rubrospinal tract is little more than vestigial in man, this tract is illustrated and discussed as though it occupied a position of size and importance in man comparable to that in lower mammals.

The numerous illustrations, which are both original and selected from the literature, are well chosen and beautifully reproduced. The salient features of the descending and ascending tracts of the spinal cord are listed in table I and the principal visceral efferent or autonomic pathways in table II, which will prove most useful to the prospective student. The type has been well chosen. There is a brief bibliography appended to each chapter and a satisfactory index.

Experimentelle Untersuchungen über Farbmischungen im zentralen und paracentralen Sehen. Von G. F. Olsson. Inauguraldissertation. Medizinische Fakultät zu Uppsala. Paper. Pp. 153, with 11 illustrations. Uppsala, 1938.

This study of color equations was submitted as an inaugural dissertation. Because of its highly technical nature and limited scope it takes on the aspect of a thesis which in America might be submitted for a degree of doctor of philosophy. There is a frank and complete discussion, introductory to the problem, concerning previous investigations in this and kindred fields. The present work was accomplished with the aid of Gullstrand's color mixing apparatus, and the author used his own practically emmetropic eyes for all his investigations. He reaffirmed that the curves for complementary colors for central and paracentral vision diverge from one another and cross in the blue-yellow sector. In a consideration of color equations and their influence by the yellow macular substance Olsson concludes that, as far as the study of central and paracentral vision is concerned, such a theory is untenable. The pamphlet includes a picture and interpolation table for the Gullstrand color mixing apparatus, protocols of the experiments and a fairly complete bibliography.

Midwifery. By Ten Teachers. Under the direction of Clifford White, M.D., B.S., F.R.C.P. Edited by Sir Comyns Berkeley, Clifford White and Frank Cook. Sixth edition. Cloth. Price, \$6. Pp. 676, with 262 illustrations. Baltimore: William Wood & Company, 1938.

In the preparation of this edition the aid of a number of new obstetricians was enlisted to replace the teachers who resigned. Some new material has been added and many of the old illustrations have been replaced with more instructive ones. In the discussion of the toxemias of pregnancy there is a peculiar division under the headings vomiting of pregnancy, the toxemias of pregnancy, albuminuria of pregnancy, preeclampsia and eclampsia, and ieterus gravis gravidarum and toxic hyperemesis. The subject of chronic nephritis is included in the chapter on albuminuria. In the treatment of septic abortion the authors advocate removal of the contents of the uterus by means of the finger. However, this procedure may be just as dangerous as the use of a curet, against which the authors warn. In the discussion of pelves there is no mention of the recent important contributions made by Thoms and by Caldwell, Moloy and D'Esopo. The authors believe that paraldehyde is probably the best analgesic and that chloroform is the anesthetic of choice during labor. Mention is omitted of

local infiltration anesthesia, although a paragraph is devoted to spinal anesthesia in spite of the fact that this form of anesthesia is particularly dangerous for pregnant women. This is the first edition in which illustrations of the low cervical cesarean section appear. The book is well written and in a uniform style notwithstanding that ten men collaborated in its preparation. The great wealth of material should permit it to retain its leadership among English textbooks on obstetrics.

Atlas de phonocardiographie clinique. Par A. Calô, assistant étranger à la Faculté de médecine de Paris. Préface du Professeur A. Clerc. Paper. Price, 60 francs. Pp. 104, with 150 illustrations. Paris: Masson & Cie, 1938.

Modern medicine is in search of precision instruments capable not only of rendering dependable service in the routine examination but also of opening new avenues of approach to unexplored regions of physiology and pathology. The importance of the analysis of heart sounds in the diagnosis of various cardiopathies induced Einthoven, Weiss, Wiggers and many others to construct ingenious sound recording apparatus, which however remained confined to a few laboratories on account of their imperfections, cost, bulk and fragility. Only in recent years, especially since the advent of radio, has the progress in this field been great, and heart sound recording devices can now be used not only for the study of the genesis and mechanism of normal sounds but also for the diagnosis of murmurs and pathologic rhythms. After a brief description of the apparatus the author devotes some space to a discussion of the graphic characteristics of normal and pathologic sounds, offers their classification, points out the advantages and limitations of the method and submits reproductions of thirty-seven phonocardiograms. In each instance the sound record is accompanied by an electrocardiogram, sphygmogram and orthodiagram, thus facilitating the interpretation of the observations. It is interesting that the phonocardiogram is able to detect certain acoustic phenomena not perceptible with the unaided ear, e. g., auricular murmurs in the course of an auriculoventricular dissociation and certain incipient forms of the gallop rhythm.

Bacteriology for Medical Students and Practitioners. By A. D. Gardner, D.M., F.R.C.S., Professor in Bacteriology, University of Oxford, Oxford. Second edition. Cloth. Price, \$2.25. Pp. 274, with 32 illustrations. New York & London: Oxford University Press, 1938.

This pocket size book is well written and is in accordance with current thought in the field of bacteriology. A systematic and rational nomenclature has been followed which arranges the various kinds of bacteria in as many broad groups of genera as there are clear and constant group differences. In place of the indefinite names, such as *Bacillus welchii* and *Bacillus melitensis*, the author uses *Clostridium welchii*, *Brucella melitensis*, *Pasteurella pestis* and so on, names which differentiate and place each of the species in a definite group. Numerous tables separate species of like organisms. Particular attention is given to the practical interpretation of laboratory tests. The author feels that a knowledge of the contents of his book, supplemented by practical work and lectures, will sufficiently equip a student for the bacteriologic aspect of medical practice, although wider reading is advocated, especially on parts of the subject the student finds most interesting. This practical little book can be heartily recommended for the physician and as a help to the medical student in his course in bacteriology.

The Physiology of Anesthesia. By Henry K. Beecher, A.B., A.M., M.D., Instructor in Anesthesia, the Harvard Medical School, Boston. Cloth. Price, \$3.75. Pp. 388. New York, Toronto & London: Oxford University Press, 1938.

At last a physiologist has reviewed the literature concerning the physiology of anesthesia and has presented a splendid bibliography, arranging the available data on the basis of both general and local anesthesia and also according to the various systems and such as the respiratory and circulatory systems and according to the effect of anesthetic agents on each of the vital organs. It was the author's hope that this book might be used in medical teaching and reference work and more particularly that it should stimulate research. It should do each of these things and without doubt will speed the already rapid development of the specialty of anesthesia.

Refraction of the Human Eye and Methods of Estimating the Refraction Including a Section on the Fitting of Spectacles and Eye-Glasses. By James Thorington, A.M., M.D., F.A.C.S. Revised and edited by J. Monroe Thorington, B.S., M.D., Associate Ophthalmologist, Presbyterian Hospital, Philadelphia. Third edition. Cloth. Price, \$3.50. Pp. 412, with 283 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1939.

The third edition of this useful little volume, in which a new format appears, extends Thorington's contributions to the subject over a period of forty years. As in the previous editions, important contributions are the simplicity and lucidness with which the subject is treated and the freedom from advanced mathematical formulas, which only confuse the beginner. Sections on the muscular insufficiencies and orthoptic training have been added, and, while these are not extensive, they give the important facts. A few typographical errors occur, such as the spelling of color on page 31 and the notation on page 118 that vision of the 60 line at 6 meters is recorded 4/60. This edition is accepted as one of the notable works in the introduction to refraction of the eye.

Die Gesetze des normalen Träumens. Von Dozent K. Leonhard, Oberarzt der Nervenklinik Frankfurt a. M. Boards. Price, 5.40 marks. Pp. 124. Leipzig: Georg Thieme, 1939.

In the author's introduction he states that the literature concerning dreams contains little except psychoanalytic concepts with their fantastic dream symbols, and that in Germany they now know that it was the racially foreign psyche that was responsible for the one-sided relating of dreams and sexuality. After this characteristic beginning he proceeds to describe dreams and states of sleep in a most superficial manner, completely ignoring the literature. He gives no clue to any scientific knowledge. The wishful basis of dreams he refutes with the ancient, many times considered, argument that anxiety dreams cannot express a wish. The author proudly concludes that the dream mirrors the varying need for rest of the nervous system; the contents have no significance. The book is not worth reading.

Vital Energetics: A Study in Comparative Basal Metabolism. By Francis G. Benedict, Director, Nutrition Laboratory, Carnegie Institution. Carnegie Institution of Washington Publication No. 503. Paper. Pp. 215, with 46 illustrations. Washington, D. C.: Carnegie Institution of Washington, 1938.

This is a comparative survey embracing basal metabolism measurements of all adult animal species studied at the Nutrition Laboratory. Considerable space is devoted to a painstaking consideration of the conditions necessary for comparative measurements of heat production, both intraspecific and interspecific, with analyses of the difficulties involved and the criteria employed. Data are presented for the various warm-blooded species on the basis of twenty-four hour heat production with reference to body weight. Then interspecific comparisons are made, expressed in terms of total heat production per kilogram of body weight and per square meter of surface area. The accompanying charts are plotted arithmetically. The warm-blooded animals considered range from the 8 Gm. mouse to the 4,000 Kg. elephant. Comparisons are made also between warm-blooded and cold-blooded animals at low cell temperatures and at 37 C. It is notable that among animals of different species but in the same weight group great differences in total heat production, as well as in metabolism expressed per kilogram and per square meter, obtain; for these discrepancies there is as yet no answer. Much emphasis is placed on the questionable validity of the surface area concept and considerable evidence is presented to indicate (p. 121) "how futile is the attempt to ascribe a constant value to the heat production of different animal species expressed per unit of surface area." Moreover, throughout the discussion the necessity is stressed of recognizing heat production rather than heat loss as the fundamental biologic activity involved in metabolic measurements. Finally, the factors which may be involved in the metabolic differences in and between species are considered and, in essence, best future progress is predicated on attempts to correlate differences in metabolic intensity with differences in bodily configuration and with differences in the composition, chemistry and distribution of the blood. A "unifying principle," if there is one which would serve as a common denominator for all animal species, is as yet an elusive quantity, and the key to the wide differences

in the level and intensity of "vital energetics" is still not at hand. Indeed, one prime purpose of this monograph is to turn attention from the simple concept of heat loss as a unifying principle—which the author regards as fallacious—to the more subtle and profound differences between individuals and species, in which ultimately such a unifying principle may be discovered.

You Can Sleep Well: The A B C's of Restful Sleep for the Average Person. By Edmund Jacobson, M.D. Cloth. Price, \$2. Pp. 269, with 40 illustrations. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1938.

The theory of sleep induced by relaxation is expounded by the author through the conversations of a mythical doctor and patient. The book is intended for laymen, although it is ironically stated in the preface that scientists and physicians may learn from it also. It is exceedingly difficult to review a work for popular consumption, especially one as breezily written as this, which skips lightly over controversial matters, conflicting evidence and other theories and which dogmatizes the author's own views. The lay reader is compelled to follow Jacobson's implied attitude of take it or leave it.

Del carcinoma primitivo broncopulmonar. Por Niceto S. Lóizaga, docente libre de Clínica de enfermedades infecciosas de la Facultad de ciencias médicas de Buenos Aires. Paper. Pp. 221, with illustrations. Buenos Aires: Librería y Editorial "El Ateneo," 1938.

This monograph is based on an extensive review of the literature and on a study of forty-six cases observed at the Hospital Muniz during the last ten years. The full histories are given of twenty-one patients studied completely in all respects, clinically as well as anatomically. The structure of primary cancer of the lung is well illustrated by photographs. The bibliography covers some twenty pages. The book is a significant addition to the growing literature on cancer of the lung.

The Scientist in Action: A Scientific Study of His Methods. By William H. George, M.Sc., Ph.D., F.Inst.P., Honorary Lecturer in Physics, University of Sheffield, Sheffield, England. Cloth. Price, \$3. Pp. 354, with 31 illustrations. New York: Emerson Books, Inc., 1938.

The choice of both British and American scientific clubs, this book deals with scientific research as a form of human action. The producers as well as the products of scientific research are examined and described. "The scientist himself becomes a part, not only of his apparatus, but of his results also. To talk about science without talking about the scientist is rapidly becoming meaningless. The research worker, as a pure-reason machine, is abandoned for the idea of a biological unit reaching to, and acting upon, an everchanging environment." The first part, on the scientific outlook, discusses qualities of scientific research (action, facts, the arrangement of facts, newness), description versus absolute truth, change and the uniformity of nature, the should-ought mechanism and assessment of value; the second part, getting scientific facts, the eyewitness's observation, scientific observation, pattern, the question whether facts are first seen in isolation, selection and abstraction; the third part, arranging scientific facts in chapters on order, laws and classification, pattern in action, the scientific theory, problems of theorizing, some factors in experimental technic and the future of experimental research. The fourth part, or conclusion, contains a personal explanation because of the stress laid on the "biologic factors" in research and a summary of the trends and conclusions of the discussion. The book is of extreme interest to those who are concerned with the methods and meaning of science. In a vigorous style it gives a clarifying and stimulating treatment of the scientist in action in research.

Biology for Pharmaceutical Students and Others. By S. Mangham, M.A., Professor of Botany, University College, Southampton, England, and A. R. Hockley, B.Sc., Lecturer in Zoology, University College, Southampton. Cloth. Price, \$6.50. Pp. 613, with 299 illustrations. Baltimore: William Wood & Company, 1938.

Written primarily for students of pharmacy, this book is well suited to any one desiring a succinct account of the basic structural features and functions of plants and animals. It deals also with development, endocrine organs, vitamins, mendelism, heredity and evolution. The structure of flowering plants is fully presented. The book is amply illustrated with adequately

labeled diagrammatic figures, largely original and very well done. In its completeness, wide scope and abundance of illustrations this textbook of biology (in the sense of a combination of botany and zoology) is of unusual excellence.

Comparative Anatomy and Physio-Pathology of the Autonomic Hypothalamic Centres. By Dr. A. A. Boon. *Acta Psychiatrica et Neurologica Supplementum XVIII.* Paper Pp 120, with 22 Illustrations. Copenhagen. Ejnar Munksgaard, Haartem De Erven F. Bohn, 1938.

In this volume the author summarizes the literature on his topic and confirms certain anatomic observations already well established. The book is of some value for quick reference to the literature but adds nothing of significance.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Compensability of Recurrence of Hernia Following Operative Repair.—In May 1932, the claimant sustained a "double hernia," which apparently was successfully corrected by an operation. He began his employment with the defendant company in August 1933. On May 21, 1934, as the result of strain in lifting a large piece of coal in the course of his employment in one of the defendant's mines, he sustained a bilateral inguinal hernia and a right femoral hernia. On June 11 an operation for the correction of these hernias was performed by a physician employed by the defendant company. The incisions "healed firmly" without any infection. On July 2, the claimant was discharged from the hospital where the operation had been performed and reported that he was able to return to work on August 6. In accordance with an agreement for compensation, the claimant was paid compensation up to August 6.

Subsequently, while outside of his employment, he felt a little pain following a forceful sneeze and thereafter another left inguinal hernia developed. The claimant then applied to the workmen's compensation board for reinstatement of the agreement for compensation on the ground that his disability had recurred. It was conceded that the sneeze was the immediate cause of the hernia. However, the claimant contended that he had sustained a recurrence of his hernia due to a weakened condition of his left abdominal wall following the operation. The defendant, on the other hand, contended that the claimant had fully recovered from the operation, that his abdominal wall had not been left in a weakened condition and that the claimant had not sustained a recurrence of his hernia but had sustained a new injury due to the sneeze which occurred outside of his employment, for which injury the defendant was in no way responsible. The board found that the claimant had "sustained a recurrence of the hernia on account of a physical weakness as a result of his previous hernial operation and due to the sneeze," fixed August 16 as the date of its recurrence and reinstated the compensation agreement. From a judgment of the court of common pleas, Allegheny County, affirming the award of the board, the employer appealed to the superior court of Pennsylvania.

The burden, said the superior court, rested on the claimant to prove that his hernia most probably would not have developed if his abdominal wall had not been in a weakened condition as a result of the operation. To support his claim for compensation, the claimant relied on the testimony of a physician who examined him following the alleged recurrence. This medical witness testified that based on his examination he was of the opinion that the claimant had sustained a recurrence of his hernia. After a herniotomy, he testified, there is a period of from eight to fourteen weeks, depending on the individual case, during which there is a definite weakness in the abdominal wall, which weakness is not a fault of the operative work but is due to the fact that the tissues are still "knitting." During this period a cough, sneeze or a lifting might produce a recurrence of a hernia. He frankly admitted that he could not state definitely whether the "healing process" had been completed in this case or whether the hernia was a new injury

due to the sneeze or was attributable to a weakened condition of the abdominal wall. On the other hand, the company physician testified that a sneeze or anything that would increase the intra-abdominal pressure might produce a hernia even in an individual who had never had a hernia and that in his opinion the claimant did not have a weakened condition of his abdominal wall as a result of the operation and that the sneeze was a productive factor in the causation of the hernia.

Although, said the court, the testimony on behalf of the claimant was not as positive as might be desired, it could not be said that the finding of the board was unsupported or incompetent evidence. Furthermore, the board was at liberty in arriving at its conclusion, to take into consideration the entire course of events following the claimant's discharge from the hospital. In the judgment of the court there was justification for reinstating the agreement for compensation. However, the court was of the opinion that the date of recurrence as fixed by the board, Aug. 16, 1934, was not supported by the evidence. The evidence merely showed that the hernia was not in existence on Sept. 27, 1934, but that it had developed prior to Dec. 1, 1934. The court concluded that there was no justification for reinstating the agreement as of any date prior to Sept. 27, 1934.

Accordingly, the court ordered that the judgment be modified and as modified affirmed.—*Roberts v. Hillman Coal & Coke Co. (Pa.)*, 200 A. 128.

Society Proceedings

COMING MEETINGS

- American Association for the Study of Gout, Cincinnati, May 21-24
Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary
- American Association for Thoracic Surgery, Los Angeles, July 5-7
Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary
- American Association of Genito Urinary Surgeons, Williamsburg, Va., May 24-26
Dr. Charles C. Higgins, 2050 East 93d St., Cleveland, Secretary
- American Association of Industrial Physicians and Surgeons, Cleveland, June 5-8
Dr. V. S. Cheney, Armour and Company, Union Stock Yards, Chicago, Secretary
- American Bronchoscopic Society, Rye, N. Y., May 26
Dr. Lyman B. Steele, 210 Leonard Ave., Boston, Secretary
- Association, Montebello, Canada, May 31-June 1
University of Pennsylvania Medical Laboratory, etary.
- American Gynecological Society, White Sulphur Springs, W. Va., May 22-24
Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary
- American Laryngological Association, Rye, N. Y., May 24-26
Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary
- American Neurological Association, Atlantic City, N. J., June 5-7
Henry A. Riley, 117 East 72d St., New York, Secretary
- American Ophthalmological Society, Hot Springs, Va., June 5-7
Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary
- American Orthopedic Association, Buffalo, N. Y., June 5-8
Dr. Ralph S. Ghormley, 110 Second Ave. S. W., Rochester, Minn., Secretary
- American Otological Society, New York, May 22-23
Dr. Thomas J. Harris, 104 East 40th St., New York, Secretary
- American Proctologic Society, Brooklyn, N. Y., June 25-27
Dr. Currier Rosset, 710 Medical Arts Bldg., Dallas, Texas, Secretary
- American Urological Association, White Sulphur Springs, W. Va., May 29-June 1
Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary
- Connecticut State Medical Society, New Haven, May 25-26
Dr. Creighton Barker, 258 Church St., New Haven, Secretary
- Maine Medical Association, Bangor, June 25-27
Dr. F. R. Carter, 225 Main St., Bangor, Secretary
- Massachusetts Medical Society, June 6-8
Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary
- Medical Library Association, Newark, N. J., June 27-29
Miss Janet Doe, 2 East 103d St., New York, Secretary
- Minnesota State Medical Association, Minneapolis, May 31-June 2
Dr. B. B. Souster, 11 West Summit Ave., St. Paul, Secretary
- Montana Medical Association of Butte, June 28-30
Dr. Thomas L. Hawkins, 50 North Main St., Helena, Secretary
- National Gastroenterological Association, New York, June 1-2
Dr. G. Randolph Manning, 1819 Broadway, New York, Secretary
- National Tuberculosis Association, Boston, June 26-29
Dr. Charles J. Hatfield, 50 West 50th Street, New York, Secretary
- New Hampshire Medical Society, Manchester, June 8-9
Dr. Carleton A. Metcalf, 5 South State St., Concord, Secretary
- New Jersey Medical Society of Atlantic City, June 6-8
Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary
- Pacific Coast Oto Ophthalmological Society, San Francisco, June 19-22
Dr. C. Allen Dickey, 450 Sutter St., San Francisco, Secretary
- Pacific Northwest Medical Association, Spokane, Wash., June 26-29
Dr. C. W. Countryman, 407 Riverside Avenue, Spokane, Wash., Secretary
- Rhode Island Medical Society, Providence, June 7-8
Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary
- Society of Surgeons of New Jersey, Elizabeth, May 25
Dr. Walter E. Mount, 21 Plymouth St., Montclair, Secretary
- Vancouver Medical Association Summer School, Vancouver, B. C., June 6-9
Dr. W. W. Simpson, 203 Medical Dental Bldg., Vancouver, B. C., Secretary
- West Virginia State Medical Association, White Sulphur Springs, June 10-12
Mr. Joe W. Savage, Public Library Bldg., Charleston, Executive Secretary

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis 23:143-276 (March) 1939

- Choice of Bismuth Preparation. Clinical Resume of Excretion and Retention Studies. H. N. Cole, T. Sollmann and Katharine Henderson, in collaboration with G. W. Binkley, H. Connors, G. Cooper, W. R. Lover, H. Reichle, W. F. Schwartz, D. Seecof and M. Sullivan, Cleveland—p. 143.
- *Treponemoidal Activity of Arsphenamine and Nearsphenamine in Vitro, with Special Reference to Citrated Blood and Suggested Method for Prevention of Transfusion Syphilis. Clara C. Kast, C. W. Peterson and J. A. Kolmer, Philadelphia—p. 150.
- *Acquired Syphilis in Children. Epidemiologic and Clinical Study. F. R. Smith Jr., Baltimore—p. 165.
- Id. Case Reports on Four Sisters. A. G. Schoch and W. E. Long, Dallas, Texas—p. 186.
- Acetarsone Orally in Treatment of Acquired Syphilis in Adults. H. M. Robinson and H. M. Robinson Jr., Baltimore—p. 188.
- Treatment of Acute Anterior Uthritis with Silver Picrate. F. Knight and H. A. Shelanski, Philadelphia—p. 201.
- Gonococcal Endocarditis. Report of Case with Autopsy. W. M. Brunet, Chicago—p. 207.
- Solisminol (Sodium Bismuthate Soluble) in Treatment of Experimental Rabbit Syphilis. C. Shaw, J. E. Kemp and Elsie Mae Fitzgerald, Chicago—p. 210.
- Acquired Syphilitic Interstitial Keratitis. Report of Two Cases. H. Pariser, Philadelphia—p. 214.
- Observations on Incidence of Latent Paroxysmal Hemoglobinuria as Evidenced by the Donath-Landsteiner Phenomenon. L. V. Dill, with technical assistance of Ida Douvros and C. E. Isenhour, Durham, N. C.—p. 220.
- Erythema of the Ninth Day Syndrome Associated with Bismuth Therapy. L. Goldman and G. E. Clarke, Cincinnati—p. 224.
- Acute Fatal Liver Necrosis Following Trypanasol Administration. Report of Two Cases. H. L. Traenkle and F. A. Dolce, Buffalo—p. 228.
- Gumma of the Brain. B. J. Alpers, Philadelphia—p. 233.

Spirocheticidal Activity of Arsphenamine.—Because of the high spirocheticidal activity of arsphenamine (disodium) and nearsphenamine, Kast and her co-workers advise that as a means for the prevention of transfusion syphilis either compound be added to citrated human blood in a final dilution of 1:10,000 whenever syphilis of the donor is suspected or known to be present. Ill or toxic effects have not been observed in eight patients.

Acquired Syphilis in Children.—Smith describes some of the clinical and epidemiologic features of acquired syphilis in 125 children 10 years of age or less. They are authenticated cases that the author collected from the larger pediatric clinics of the eastern and southern United States. In the Johns Hopkins Hospital only forty-five cases of early acquired syphilis in children less than 11 years of age were observed in seventeen years (1920-1937), during which time there were ninety cases among children from 11 to 15 years of age and 4,487 cases among adults. The disease was acquired through attempted sexual intercourse by forty-three, through kissing by fifteen, through a household contact by fourteen and through blood transfusion by nine, on forty-four acquisitions there are no data. There were approximately twice the number of females affected as males. This difference became more marked with advancing age. In most instances of infection by illicit sexual intercourse a female child was infected by an adult male. Also the risk of infection from casual household contact seems to be greater for female than for male children. Most of the patients were from families belonging to the lower economic groups whose hygienic habits were poor and in whose homes overcrowding was prevalent. The clinical characteristics of acquired syphilis in children do not differ materially from those of acquired syphilis in adults. Treatment produced satisfactory clinical and

serologic results. The risk of acquiring syphilis by the ordinary contacts between individuals living or working in the same house seems to be small, but when the contact is intimate as in the case of young children with their mother or nurse the risk is sufficient to have a practical significance. Infection by playmate contact is usually acquired by secretive infantile sex practices rather than by the ordinary relationships of play. The nine cases of transfusion syphilis emphasize the necessity for careful pretransfusion examination of all donors, including parents and relatives.

Annals of Internal Medicine, Lancaster, Pa.

12:1175-1402 (Feb.) 1939

- Prophylaxis in Allergy. R. A. Kern, Philadelphia—p. 1175.
- *Chronic Brucellosis (Undulant Fever). Analytic Study of the Positive Reactors Among School Children. F. E. Angle and W. H. Algie, Kansas City, Kan.—p. 1189.
- Variation of Blood Pressure with Skeletal Muscle Tension and Relaxation. E. Jacobson, Chicago—p. 1194.
- Human Autonomic Pharmacology. XV. Effect of Acetyl Beta-Methylcholine Chloride (Mechoyl) by Iontophoresis on Arterial Hypertension. J. Loman, M. T. Leses and A. Myerson, Mattapan, Mass.—p. 1213.
- Low Chest and Upper Abdominal Pain. W. M. Ballinger, Washington, D. C.—p. 1223.
- Chemical Nature of Heart Failure. G. Herrmann and G. M. Decheder Jr., Galveston, Texas—p. 1233.
- *Macrocytic Anemia, Other Than Pernicious Anemia, Associated with Lesions of the Gastrointestinal Tract. C. C. Sturgis and S. M. Goldhamer, Ann Arbor, Mich.—p. 1245.
- Tolerance and Toxicity of Insulin. II. With Forced Administration of Carbohydrate. F. M. Allen, New York—p. 1263.
- Psychotherapy, with Special Reference to Use of Hypnosis. J. L. McCartney, Philadelphia—p. 1279.
- The Problem of Rheumatism and Arthritis. Review of American and English Literature for 1937 (Fifth Rheumatism Review). P. S. Hench, Rochester, Minn.; W. Bauer, Boston; M. H. Dawson, New York; F. Hall, Boston; W. P. Holbrook, Tucson, Ariz., and J. A. Key, St. Louis—p. 1295.

Chronic Brucellosis in School Children.—Angle and Algie found evidence of chronic illness (the persistence of any two of the following symptoms: nervousness, headache, rheumatic symptoms or constipation) in 179 of the 462 positive brucellergen reactors, negative tuberculin reactors studied in 1937. The symptoms persisted in 57.5 per cent of the 139 children reexamined in 1938. Control studies indicated that there was a higher percentage of children with chronic illness in the group under investigation. Replies received from twenty-six professors of immunology indicated that the presence of agglutinins, opsonins and allergic cutaneous tests are specific reactions for present or past Brucella infection. Immunologic evidence of Brucella infection does not mean disease. The diagnosis of chronic brucellosis depends on clinical signs plus some positive laboratory data. The ambulatory and subclinical types of Brucella infection are apparently not uncommon.

Macrocytic Anemia Associated with Gastrointestinal Lesions.—During the last eleven years Sturgis and Goldhamer have observed a large group of patients with pernicious anemia during the course of which they encountered a number of patients with macrocytic anemia who illustrate strikingly the various types of gastrointestinal lesions which may cause such an alteration in the blood. One reason which indicates that intestinal lesions are responsible for this type of anemia is the disappearance of the anemia when the intestinal lesion is repaired. In one case, for example, the erythrocyte count returned to normal following resection of the small intestine for partial obstruction, at which time the patient was not receiving any antianemic therapy. It is also of significance that the anemia reappeared when the partial obstruction recurred. Further evidence that the group of patients which was studied did not have a true Addisonian anemia which by chance was associated with some gastrointestinal lesions is that in three of the ten patients considered free hydrochloric acid was present in the gastric secretions. Also five of the remaining seven patients did not have paresthesia of the hands and feet, which is present in 90 per cent of patients with pernicious anemia. Furthermore, only one patient had recurrent glossitis, which is present in approximately 65 per cent of patients with Addisonian anemia. Atrophy of the tongue was not present in the eight patients in whom this sign was looked for. This sign is present in about half of the patients with pernicious anemia. It is not difficult

to understand why a macrocytic anemia develops in some patients following partial resection of the stomach. The intrinsic factor which is essential to maturation of the erythrocytes is undoubtedly secreted by the glands in the gastric mucosa. It appears to be a logical assumption that the development of a macrocytic anemia following operations on the stomach depends almost entirely on how much of the stomach remains following the operation. The association of this type of anemia with the presence in patients of multiple intestinal anastomoses can readily be explained on the ground that the intestinal contents may pass through only a small portion of the small intestine in such cases and, therefore, the likelihood of absorbing a normal amount of the active principle would be diminished. It is somewhat more difficult to understand why this type of anemia should develop in a patient with an intestinal stricture or partial obstruction, such as existed in one of the present cases, as only a relatively small portion of the small intestine was involved in the pathologic process. A plausible assumption would be that even a localized lesion may in some manner affect the entire intestinal tract in such a way as to destroy or prevent the absorption of the active principle. It appears that from two to five years is required for macrocytic anemia to develop following resection of the stomach, that is, to reach a stage severe enough to produce symptoms. The length of time elapsing varies according to several factors. First, it is dependent on the extent to which the gastric and intestinal function is impaired; secondly, it is affected by the amount of reserve erythrocyte maturing material which is stored in the liver and perhaps elsewhere in the body. Other conditions which may possibly be of importance are the age of the patient and the presence of infections. For example, the reserve supply of the active principle would be consumed more rapidly in an elderly patient than in a younger one or in one with an active infection, and on this account a macrocytic anemia would develop more quickly in such a patient.

Archives of Neurology and Psychiatry, Chicago

41: 435-658 (March) 1939

- Gliomas of the Pons: Clinical and Pathologic Characteristics. B. J. Alpers and J. C. Yaskin, Philadelphia.—p. 435.
- Pathologic Picture of Thujone and Monobromated Camphor Convulsions: Comparison with Pathologic Picture of Human Epilepsy. L. Opper, New Haven, Conn.—p. 460.
- "Silver Cells" and "Spirochete-like" Formations in Multiple Sclerosis and Other Diseases of the Central Nervous System. G. B. Hassin and I. B. Diamond, Chicago.—p. 471.
- Quantitative Absorption of Phenolsulfonphthalein from Subarachnoid Space. W. J. Gardner and W. A. Nosik, Cleveland.—p. 484.
- *Return of Cognitive Conscious Functions After Convulsions Induced with Metrazol. L. H. Cohen, Worcester, Mass.—p. 489.
- Ligation of the Left Anterior Cerebral Artery: Its Hazards and Means of Avoidance of Its Complications. J. L. Poppen, Boston.—p. 495.
- Action of Metrazol (Pentamethylenetetrazol) on Hypothalamus of the Cat. J. H. Masserman, with technical assistance of E. W. Haertig, Chicago.—p. 504.
- Cardiac Activity During Epileptic Seizures. T. C. Erickson, Montreal.—p. 511.
- *Electro-Encephalography in Clinical Neurology: Its Value in Routine Diagnosis. D. Williams, London, England, and F. A. Gibbs, Boston.—p. 519.
- Neurogenic Tumors Arising from the Sacrum. A. W. Adson, F. P. Moersch and J. W. Kernohan, Rochester, Minn.—p. 535.
- Localized Nonsuppurative Encephalitis Adjacent to a Focus of Infection in the Skull. M. Atkinson, New York.—p. 536.
- *Tuberous Sclerosis: Relief of Epileptic Symptoms by Radiation Therapy. A. B. Friedman, Brooklyn.—p. 565.
- Analysis of the Thinking Disorder in a Case of Schizophrenia. Eugenia Panfmann, Chicago.—p. 568.
- Bilateral Frontal Lobectomy: Follow-Up Report of Case. R. M. Brickner, New York.—p. 580.
- Sign of Facial Palsy. R. Wartenberg, San Francisco.—p. 586.

Return of Consciousness After Induced Convulsions.

—Cohen studied the return of the cognitive conscious functions in the period following convulsive seizures. The studies were carried out on schizophrenic patients during metrazol therapy. The functions of esthesia, prosexia, gnosis, praxia and mnesia reappear in the order given. It is suggested that these studies be extended, since they have a bearing on the general problem of the nature of consciousness. Furthermore, it appears that metrazol offers a safe and convenient means for the study of the interruption and normalization of the stream of consciousness.

Electro-Encephalography in Clinical Neurology.—Williams and Gibbs state that the electro-encephalogram has been used in the routine investigation of patients in a large neurologic and neurosurgical service over a period of ten months. The site and character of foci of abnormal cortical rhythms were determined by the method described by Walter. In 105 cases in which intracranial lesions were suspected there was a close correlation between the actual position of the lesions and that predicted by the electro-encephalograms in the fifty cases in which the pathologic process was demonstrated. The lesion was demonstrated at operation or necropsy in thirty-five of these fifty cases, and in another fifteen cases clinical evidence of localization was strong or was supported by the results of previous exploration, by x-ray evidence or by other signs of the lesion, such as a visible mass, skull defect or scalp wound, so that the diagnosis could be made with accuracy. In forty-one cases in which no cerebral lesion was demonstrated in the electro-encephalograms, subsequent clinical investigation gave negative results. In the remaining fourteen cases the position of predicted cerebral lesions could not be confirmed through lack of clinical and pathologic data. It is concluded that the method has great practical value as a diagnostic procedure in routine neurologic practice.

Tuberous Sclerosis.—Friedman reports a case of tuberous sclerosis without mental deterioration treated with roentgen rays. The epileptic symptoms were relieved. The patient has remained well for more than two and a half years.

Archives of Surgery, Chicago

38: 397-598 (March) 1939

- Congenital Cystic Dilatation of the Bile and Pancreatic Ducts: Necropsy Thirteen Years After Hepaticoduodenostomy. G. L. McWhorter, Chicago.—p. 397.
- Clinical Significance of Calorimetric Changes in the Lower Extremity. B. Lipshutz and M. Naide, Philadelphia.—p. 412.
- Histologic and Histochemical Structure of the Normal Thyroid Gland. A. E. Hertzler, Halstead, Kan.—p. 417.
- Intracranial Hypertension of Unknown Cause: Cerebral Edema. A. L. Saks and O. R. Hyndman, Iowa City.—p. 428.
- Swelling of the Brain in Cases of Injury to the Head. P. Shapiro and H. Jackson, Chicago.—p. 443.
- Experimental Production of Tumors of the Brain with Shope Rabbit Papilloma. B. Woodhall, R. W. Graves and J. W. Beard, Durham, N. C.—p. 457.
- The Superior Colliculi: Their Function as Estimated from a Case of Tumor. O. R. Hyndman and W. J. Dulin, Iowa City.—p. 471.
- *Hemangioma of Joints: Report of Five Cases. G. E. Bennett and M. C. Cobey, Baltimore.—p. 487.
- Atresia Ani Urethralis: Report of Case. L. A. Thunig, Brooklyn.—p. 501.
- *Ethyl Alcohol as Germicide. P. B. Price, Baltimore.—p. 528.
- Parathyroidectomy for Raynaud's Disease and Scleroderma: Late Results. Alice R. Bernheim and J. H. Garlock, New York.—p. 543.
- Regional Redistribution of Blood in Experimental Secondary Shock. H. A. Davis, Memphis, Tenn., and R. J. Jernstad, St. Joseph, Mo.—p. 556.
- Review of Urologic Surgery. A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. von Lichtenberg, Budapest, Hungary; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson and J. T. Priestley, Rochester, Minn.; E. Wildbolz, Berne, Switzerland, and V. J. O'Connor, Chicago.—p. 581.

Hemangioma of Joints.—Bennett and Cobey present five cases of hemangioma of the knee joint. The age at onset varied from 18 months to 18 years and the duration of symptoms from ninety minutes to eight years. Trauma was not a factor. Swelling was present in all cases, with pain and recurring attacks of limp and pain on motion in four. The palpable elastic, spongy mass, compressible and distensible, was evident in only two. There was tenderness in two. Muscular atrophy and crepitation were present in only one case. Two of the patients received no treatment before operation, two were treated with rest in bed and one was treated with bandages and casts. The roentgenograms throughout failed to show any abnormality except for erosion of the cartilage in one case. In the first case complete excision was attempted, hemorrhage and infection followed, and finally amputation had to be performed. Complete excision was possible in only one case, in which the tumor was pedunculated. Biopsy followed by radium or roentgen therapy was carried out in the other three cases, with practically complete recovery. The final diagnosis of hemangioma was made and verified by

histologic study in the first four cases. The signs, symptoms and course made the diagnosis certain in the last case.

Ethyl Alcohol as Germicide.—Using original quantitative tests of bactericidal activity, Price has found ethyl alcohol, within certain narrow limits of concentration, to be strongly germicidal, both in vitro and on the skin. Exactly 70 per cent by weight (which has no constant volume per cent equivalent) is the most effective concentration. Even slight variations from this particular strength lessen its bactericidal power. Seventy per cent by volume is almost useless. Degermation of skin by alcohol takes place at a regularly logarithmic rate. Each minute the skin is kept in 70 per cent (by weight) solution without friction is equivalent to about six and one-half minutes of scrubbing in water. Friction increases the speed of degermation. Against test bacteria in suspension, 70 per cent (by weight) alcohol acts even more strongly and rapidly. Higher and lower concentrations are less effective. The difference between the degerming effects of alcohol on skin and in vitro are thought to be due largely, if not entirely, to differences in degree of contact between germicide and bacteria. This explains also why friction increases the germicidal action of alcohol on skin. Evaporation weakens 70 per cent alcohol and lessens its bactericidal power. A routine method of preoperative preparation of the hands has been evolved which, while simple, is a great deal more effective than techniques in use at present in many leading hospitals. Seventy per cent by weight alcohol is recommended also for use in preparing the field of operation and in disinfecting contaminated hands.

Canadian Medical Association Journal, Montreal

40: 213-318 (March) 1939

- *Prevention of Silicosis by Metallic Aluminum: H. J. J. Denny, W. D. Robson, Schumacher, Ont., and D. A. Irwin, Toronto.—p. 213.
Clinical Significance of a Lump in the Breast. E. M. Eberts, Montreal.—p. 228.
Leukoplakia and Allied Mouth Conditions. D. Quick, New York.—p. 234.
Low Back Pain and Sciatica. J. A. L. Walker, Windsor, Ont.—p. 240.
Carcinoma of the Sigmoid Colon (Radiologic Study). A. C. Singleton and M. R. Hall, Toronto.—p. 247.
*Abolition of Clinical Tuberculosis by Anticipation and Control. W. Ogden, in collaboration with G. C. Anglin, M. Brown, A. H. W. Caulfield, Edith Gordon, T. G. Heaton, W. C. Kruger, E. L. Seasmith, Margaret S. Thompson and T. R. Welwood, Toronto.—p. 253.
Diabetes Mellitus with Marked Hypercholesterolemia and Signs Simulating Cerebral Thrombosis. Case. I. M. Rabinowitch, Montreal.—p. 257.
Changing Conditions for Cesarean Section. R. T. Weaver, Hamilton, Ont.—p. 259.
Hernia. R. K. Magee, Peterborough, Ont.—p. 264.
Intravenous Glucose Tolerance Curve as Index of Liver Function and Liver Replacement Therapy in Cases of Hepatic Insufficiency. R. Wilson, Vancouver, B. C.—p. 268.

Prevention of Silicosis by Metallic Aluminum.—In a previous article Denny and his co-workers showed that the addition of small quantities of metallic aluminum powder almost completely inhibited the solubility of silicious material in the beaker. Silicosis developed in six rabbits exposed to quartz dust for six months. The condition did not develop in seven rabbits exposed to quartz dust plus 1 per cent metallic aluminum powder for the same period. The authors state that metallic aluminum on being converted into hydrated aluminum reduces the toxicity of quartz in tissues by flocculation, by absorbing silica from solution, but chiefly by coating the quartz particles with an insoluble and impermeable coating. This coating has been definitely identified as a gelatinous hydrated alumina, which on drying forms the crystalline alpha aluminum monohydrate boehmite. Other silicious materials when treated in a similar manner to quartz and aluminum in water appear to be coated by the precipitated gelatinous aluminum hydrate. Animals whose lungs on analysis contained 1 per cent or more of metallic aluminum have shown no evidence of silicosis after being exposed to quartz dust up to periods of seventeen and a half months. This was in direct contrast to well developed silicosis in the quartz control rabbits in seven months. In lungs having less than 1 per cent aluminum in which fibrosis is present there is no demonstrable evidence of hydrated aluminum in the fibrotic areas. In lungs in which the hydrated aluminum is shown on staining to be intimately and uniformly mixed with the silica particles, fibrosis has never been found. Aluminum dust for the prevention of silicosis should be of a particle size below 5 microns and grease free. It should be uniformly mixed in

any inhaled dust and bear a definite percentage to this dust at all times. To prevent silicosis, aluminum dust may be inhaled daily independently of the silicious dust. The aluminum dust must be sufficiently concentrated in the inhaled dust to provide a minimum concentration in the lung of 1 per cent at all times. The inhalation of aluminum dust in large quantities over long periods of time showed no effect on the general health of the animals and no evidence of toxicity or damage to tissues. The concentration of aluminum dust necessary to prevent silicosis is hundreds of times below its explosive concentration.

Abolition of Clinical Tuberculosis.—Ogden and his collaborators present a plan for following contacts and normals through which an attempt is made to detect "preclinical tuberculosis," thus reducing the incidence of the disease and at the same time aiding diagnosis in the really minimal stages of those getting through the preclinical phase and acquiring actual disease. Over a period of fifteen years a total of 1,300 known contacts, tuberculin positive, and 400 normals have been under observation. Of those who followed the prescribed scheme, in not one has tuberculosis developed. When the contact series includes those whose observation was irregular, the disease developed in only 4.15 per cent (fifty-four) of the total. The incidence in other contact series ranges from 10 to 40 per cent, averaging from 20 to 25 per cent. Known tuberculosis contacts should be tested, first by tuberculin; then, if they are positive, this should be followed by serial serologic examination. All normals not known to be contacts should be tested, because exposure and infection frequently take place without contact being known. When they are tuberculin positive they are then serologically tested as contacts, because such they must have been. Serologic tests differentiate between those who are liable to develop tuberculosis and those who are not. Those thus found liable to develop tuberculous disease are advised accordingly.

Endocrinology, Los Angeles

24: 297-434 (March) 1939

- *Observations on Occurrence of an Antidiuretic Substance in Urine of Patients with Preeclampsia and Eclampsia. H. M. Teel and D. E. Reid, Boston.—p. 297.
Hormone Influences on Excitability of Muscular Protoplasm of the Rat's Uterus. F. C. Katzenstein and S. Soskin, Chicago.—p. 311.
Gonadotropic Hormone: Clinical Application of Extraction Methods for Assay Purposes. C. G. Heller and Emily J. Heller, Madison, Wis.—p. 319.
Stability of Testis Hormone. D. R. McCullagh, Cleveland.—p. 326.
Excretion and Fate of Androgens: Excretion of Injected Testosterone and Its Various Derivatives. C. D. Kochakian, Rochester, N. Y.—p. 331.
Daily Excretion of Urinary Androgens in Normal Children. I. T. Nathanson, Lois E. Towne and J. C. Aub, Boston.—p. 335.
*Suppressive Action of Testosterone Propionate on Menstruation and Its Effect on Vaginal Smears. G. N. Papanicolaou, H. S. Ripley and E. Shorr, New York.—p. 339.
*Treatment of Female Menopause with Male Sex Hormone. L. Kurzrok, C. H. Birnberg and S. Livingston, Brooklyn.—p. 347.
Progesterone Is Androgenic. R. R. Greene, M. W. Burrill and A. C. Ivy, Chicago.—p. 351.
Creatine-Creatinine Metabolism and Hormones: Anterior Pituitary Hormones, Theelin and Testosterone Propionate. P. Pizzolato and H. H. Beard, New Orleans.—p. 358.
Persistence of Four to Five-Day Activity Cycles in Vitamin A Deficient Rats with Constant Cornification of the Vaginal Epithelium. C. P. Richter and B. Barelare Jr., Baltimore.—p. 364.
Salt Taste Thresholds of Normal and Adrenalectomized Rats. C. P. Richter, Baltimore.—p. 367.
Renal Lesion in Hyperparathyroidism. W. A. D. Anderson, Memphis, Tenn.—p. 372.
Extent of Regeneration of the Enucleated Adrenal Gland in the Rat as Determined by Capsule Left at Operation. D. J. Ingle and J. H. Minn.—p. 379.
*Thyroid in Treatment of Menstrual Irregularities. Ruth C. Foster and Madeline J. Thornton, Madison, Wis.—p. 383.
Vitamin A Deficiency in Disease of Thyroid Gland: Its Detection by Dark Adaptation. M. G. Wohl and J. B. Feldman, Philadelphia.—p. 389.
Thyroid Function in Diabetes Insipidus in the Rat. H. G. Swann and P. E. Johnson, Chicago.—p. 397.
Endocrinologic and Metabolic Observations in Exfoliative Dermatitis. W. J. Hanes and R. S. Crew, Philadelphia.—p. 404.
Present Day Status of Migraine Therapy. Mary E. O'Sullivan, New York.—p. 414.

Antidiuretic Substance in Urine in Eclampsia.—Teel and Reid state that concentrates prepared from the urine of pre-eclamptic and eclamptic women during the period of acute water retention exert marked antidiuretic effects on water diuresis in rats. The antidiuretic effect of a concentrate prepared from the

urine of an eclamptic patient after she had taken 1,400 cc. of water by mouth persisted. Similarly prepared concentrates from the urine of normal pregnant women during the last trimester of pregnancy and at the time of delivery exert little or no anti-diuretic effect. However, if normal pregnant women are sufficiently dehydrated by withholding water, the urine contains amounts of antidiuretic substance comparable to those found in preeclamptic and eclamptic women. The antidiuretic principle recovered from the urine of preeclamptic and eclamptic women resembles solution of posterior pituitary. This substance acting on the kidney in abnormal amounts, or perhaps inadequately opposed by an antagonist, offers an immediate mechanism for the retention of water in preeclampsia and eclampsia.

Suppressive Action of Androgen on Menstruation.—

The inhibitory action of the male hormone on human menstruation is illustrated by Papanicolaou and his associates by a case that they report. This is in accord with previous studies on lower mammals and primates. The absence of uterine bleeding and the persistence of an atrophic vaginal smear type during the period of treatment with the male hormone indicate that the cyclic uterine and vaginal functions were temporarily suppressed. Whether the male hormone acts directly on the ovaries or indirectly through its action on other endocrine glands is still uncertain. That menstrual functions can be inhibited in human beings by androgen, with the induction of a temporary sterility, is of considerable therapeutic significance. A beneficial effect on excessive and uncontrolled uterine bleeding has already been reported. This cessation of bleeding was associated with the development of an atrophic endometrium, an observation which has been subsequently confirmed. This endometrial atrophy is the uterine counterpart of the changes in the vaginal epithelium which underlie the atrophic vaginal smear that the authors observed following the administration of the male hormone. The hormone also appears to be of therapeutic help in the treatment of the menopausal syndrome. Once the atrophic smear is reached, the dose can be reduced to the minimal one which will maintain it. While the authors noticed no masculinizing effects of the male hormone in their patient, a recent study reports changes such as enlargement of the clitoris, marked vulval hyperemia and temporary lowering of the voice with intensive androgenic therapy. Menstruation occurred spontaneously in their patient twenty-eight days after androgenic therapy was stopped.

Treatment of Menopause with Androgen.—By the administration of from 30 to 50 mg. of testosterone propionate Kurzrok and his co-workers were able to ameliorate completely or almost completely the symptoms of the menopause in twenty-one cases. The substance produced no effect on the breasts, in that no patient complained of mastalgia. One patient with arthritis accompanying the menopause was benefited. There were no instances of itching or discharge due to the male sex hormone. Two cases of *Trichomonas vaginalis* infestation with pruritus responded to treatment with 25 per cent saline douches. Several of the younger women who had had a surgical menopause with resulting markedly severe symptoms responded fully as well as those in whom the menopause was spontaneous. One patient, with severe diabetes, was relieved of her flushes and sweats without any effect on the status of the diabetes. A few patients complained of localized pruritus on one occasion only, at the site of injection. Three patients had been treated previously with large doses of estradiol benzoate after a radiation menopause, with subsequent uterine bleeding; none of these women had any bleeding following administration of the male hormone.

Thyroid for Menstrual Irregularities.—Foster and Thornton treated fifty patients having menstrual irregularities with desiccated thyroid. The women have been observed for a period of from one to four years. Their ages have ranged from 16 to 34 years. With a few exceptions, only those who showed no pathologic changes in the pelvis have been treated. They all had basal metabolism rates below zero (from -1 to -33) the average being -15. Of the twenty-five patients with dysmenorrhea, seventeen had complete relief, five partial relief and three no relief. Of the seventeen patients with oligomenorrhea, all reported definite relief as long as they continued taking thyroid. Several of this group tried going without treatment during the summer vacation but returned in the fall asking to resume treatment because their symptoms had recurred. All stated that they

felt much better when having their regular periods. The few patients in this series complaining of menorrhagia and metrorrhagia responded to thyroid therapy in a most satisfactory manner. Of four patients who complained of marked irritability prior to menstruation two obtained partial relief, enough so that they did not want to stop thyroid medication. One had complete relief and one noticed no difference. Thyroid was stopped several times but always with a recurrence of the symptoms.

Iowa State Medical Society Journal, Des Moines

29: 91-142 (March) 1939

- Useful Anesthetic Methods and a System of Transfusion of Blood for Use in General Practice. R. C. Adams, Rochester, Minn.—p. 91.
Brachial Block Anesthesia. L. J. Miltner, Davenport, and C. L. Chao, Peiping, China.—p. 94.
Diabetes and Its Management: Review of 366 Cases. E. B. Winnett, Des Moines.—p. 98.
*Prothrombin Test and Vitamin K Treatment for Bleeding Tendency in the Jaundiced Patient. P. F. Olson, Dubuque.—p. 103.
Treatment of Common Foot Disorders. W. R. Hamsa, Omaha.—p. 105.
Kidney Function Tests. W. C. Egloff, Mason City.—p. 110.

Prothrombin Test and Vitamin K for Bleeding.—Olson reports the value of vitamin K in a patient who had been intermittently jaundiced for five months and apparently completely jaundiced for three months. Preoperatively, for obstruction of the common duct, she was given intravenous dextrose and a blood transfusion. At operation a diverticulum of the common duct was encountered and a calcareous obstruction at the ampulla of Vater was relieved. The duct was closed over a T tube, from which bile promptly flowed. Unusual bleeding was encountered at the time of operation and oozing occurred for several days after the operation. Six days after operation a severe hemorrhage occurred. This was controlled by a blood transfusion but the oozing recurred, and four days later another serious hemorrhage requiring transfusion again occurred. A prothrombin bleeding time after the method of Quick was 200 seconds. Vitamin K was given, two capsules being administered orally three times a day after meals. Each capsule was accompanied by 0.32 Gm. of bile salts. The prothrombin bleeding time was determined three days later and found to be 120 seconds. No further hemorrhage occurred and the oozing from the wound was decreasing. Seven days after the continued use of vitamin K the prothrombin bleeding time was reduced to thirty-eight seconds, which was comparable to a normal control, and all bleeding had stopped. The convalescence henceforth was uneventful. The author believes that, in jaundiced patients with an elevated prothrombin bleeding time, vitamin K should be administered prophylactically preoperatively and postoperatively until such time as the liver shall be able to elaborate concentrated bile into the intestinal tract and until such time as a balanced diet can be consumed.

Journal of Clinical Investigation, New York

18: 171-256 (March) 1939

- *Gonadotropic Hormone: Urine Assays of Normally Cycling, Menopausal, Castrated and Estrin Treated Human Females. C. G. Heller and Emily J. Heller, Madison, Wis.—p. 171.
Control of Methemoglobinemia with Methylene Blue. W. B. Wendel, Memphis, Tenn.—p. 179.
Water Exchange of Premature Infants—Comparison of Metabolic (Organic) and Electrolyte (Inorganic) Methods of Measurement. H. H. Gordon, S. Z. Levine, Eleanor Marples, Helen McNamara and Helen R. Benjamin, New York.—p. 187.
Experimental Hyposthenuria. J. M. Hayman Jr., N. P. Shumway, P. Dumke and M. Miller, Cleveland.—p. 195.
*Further Observations on Occurrence of Rheumatic Manifestations in the Families of Rheumatic Patients. R. L. Gauld, Baltimore; A. Ciocco, Washington, D. C., and Frances E. M. Read, Baltimore.—p. 213.
Autologous and Homologous Transfusion of Human Ascitic Fluid. H. A. Davis and J. F. Blalock Jr., Memphis, Tenn.—p. 219.
Blood Flow and Vasomotor Reactions in Hand, Forearm, Foot and Calf in Response to Physical and Chemical Stimuli. P. Kunkel, E. A. Stead Jr. and S. Weiss, Boston.—p. 225.
Electrolyte Balances During Artificial Fever, with Special Reference to Loss Through the Skin. E. H. Keutmann, S. H. Bassett and S. L. Warren, Rochester, N. Y.—p. 239.
Changes in Pulmonary Volume Following Lobectomy for Bronchiectasis. G. E. Lindskog, New Haven, Conn.—p. 251.

Gonadotropic Content of Urine.—The Hellers determined the gonadotropic content of the urines from sixty-six menopausal patients. It was found that their potency was not related to the presence or absence of symptoms, age, hysterectomy or involution. No difference in gonadotropic potency was found

between menopausal women with symptoms and senile women, castrated women or menopausal women without symptoms. Urinary gonadotropic concentration was low in women with regular normal menstrual cycles, high in menopausal women in whom cycles had ceased and intermediate in menopausal women with irregular cycles. Treatment with estrogen alleviated the vasomotor symptoms of fifteen menopausal women but failed to reduce their gonadotropic potency concurrently. Continued treatment with estrogen caused a slight reduction in potency but failed to suppress it by significant amounts.

Rheumatic Manifestations in Relatives of Rheumatic Patients.—Gauld and his colleagues studied the high incidence of rheumatic disease in the families of ninety-six rheumatic children. The percentage of persons with a rheumatic history who had parents with a similar history was found to be consistent in two generations of these families and was 3.7 times as high as was found in the families of a control group of normal children. The offspring of the grandparents of the rheumatic and control persons were studied to see whether any relationship was present between the type of mating with respect to rheumatic disease and the percentage of children who were rheumatic. When one or both parents had a history of rheumatic manifestations (rheumatic fever or carditis or chorea) a greater percentage of the offspring was rheumatic than was found in the offspring of parents who had no history of rheumatic disease. The percentage of rheumatic manifestations was found to be almost twice as high in female offspring of rheumatic mothers as in the male offspring of these mothers. A greater percentage of persons with rheumatic disease was found among the maternal aunts and uncles than was found among the paternal aunts and uncles of the rheumatic cases. The data suggest that a hereditary constitution may play a part in the predisposition to this disease. The evidence, however, does not exclude the possibility that infection plays an important part and that exposure may be the predominating factor.

Journal of Experimental Medicine, New York

69: 327-484 (March) 1939. Partial Index

- Virus Disease of Cats, Principally Characterized by Aleukocytosis, Enteric Lesions and Presence of Intracellular Inclusion Bodies. W. D. Hammon and J. F. Enders, Boston.—p. 327.
- Studies on Antibacterial Immunity Induced by Artificial Antigens: I. Immunity to Experimental Pneumococcal Infection with Antigen Containing Cellobiuronic Acid. W. F. Goebel, New York.—p. 353.
- *Complement Fixation in Human Malaria with Antigen Prepared from Monkey Parasite *Plasmodium knowlesi*. M. D. Eaton and L. T. Coggeshall, New York.—p. 379.
- Antigenic Properties of Type Specific Substance Derived from Group A Hemolytic Streptococci. G. K. Hirst and Rebecca C. Lancefield, New York.—p. 425.
- Organ Work and Organ Weight. Florence Walter and T. Addis, San Francisco.—p. 467.

Complement Fixation in Human Malaria.—Eaton and Coggeshall describe complement fixation studies the antigens for which were prepared from (1) normal monkey red cells, (2) parasitized red cells of monkeys dying with *Plasmodium knowlesi* infection and (3) the spleens of monkeys dying with *Plasmodium knowlesi* infection. The serums were obtained from (1) normal human beings, (2) patients with syphilis, (3) patients with dementia paralytica who were receiving malaria therapy and (4) patients with malaria alone. The malarial antigens gave negative complement fixation reactions with from 70 to 80 per cent of the syphilitic and normal serums and weak or doubtful reactions with the remaining 20 to 30 per cent. With the exception of one antigen prepared from spleen, there was no evidence that the malarial antigens were more reactive with Wassermann-positive than with Wassermann-negative serums. Some human serums gave weak complement fixation with antigens prepared from normal monkey erythrocytes and the percentage of these positive reactions was slightly higher with malarial serums than with normal or syphilitic serums. The most sensitive and specific malarial antigen was prepared from dried parasitized red cells by extraction with saline solution, freezing and thawing. This *Plasmodium knowlesi* antigen gave strong complement fixation with malarial serums from human beings infected with *Plasmodium knowlesi*, *Plasmodium vivax* or *Plasmodium falciparum*. The titer of complement fixing antibodies reaches a maximum about one month after the beginning of the acute infection. At this time all of the *Plasmodium knowlesi* serums

tested were positive. After four months the reaction diminishes rapidly in titer but may remain positive for twelve months or longer. With *Plasmodium knowlesi* infections in man, the complement fixation reaction remains positive for some time after the infection has apparently disappeared as judged by daily smears and inoculation of monkeys with the blood. The complement fixation reaction in malaria is group specific rather than species specific. Serums from patients infected with *Plasmodium vivax* or *Plasmodium falciparum* reacted in the same way with the *Plasmodium knowlesi* antigen as the homologous serums. Absorption of malarial human serums with normal monkey erythrocytes does not remove the immune bodies which fix complement with malarial antigens.

Journal of Lab. and Clinical Medicine, St. Louis

24: 559-668 (March) 1939. Partial Index

- Specificity of Pneumococcus Types by Quellung and Agglutination Reactions. A. Noble and Bertha C. Cameron, Detroit.—p. 559.
- *Observations on Use of Quinidine Sulfate in Children. C. R. Messeloff, New York.—p. 574.
- Effect of Bananas on Laxation. P. L. Harris, Charleston, S. C., and G. L. Poland, New York.—p. 580.
- Ragweed Hay Fever: Effect of Dosage in Treatment of 314 Cases. H. D. Dundy, L. Levin and H. Markow, Brooklyn.—p. 583.
- *Effects of Tobacco Smoking on Health: Study of 2,031 Medical Records. J. J. Short, H. J. Johnson and H. A. Ley Jr., New York.—p. 586.
- *Direct Comparison of Reactions of Human System to Tobacco Smoke and Adrenalin. J. J. Short and H. J. Johnson, New York.—p. 590.
- Relation Between Skin Sensitivity, Liver Function, Leukopenic Index and Toxic Effects from Cinephol. W. B. Rawls, B. J. Gruskin, A. A. Ressa and A. S. Gordon, New York.—p. 597.
- Comparison of Intradermal Tests with Agglutinability and Certain In Vitro Tests of Streptococci, Staphylococci, Micrococci Catarrhalis and Colon Bacilli Isolated from Persons Suspected of Having Chronic Infection. G. H. Chapman and C. Berens, New York.—p. 601.
- Study of Calcium and Phosphorus in Cerebrospinal Fluid. D. J. Cohn, I. Kaplan and A. Levinson, Chicago.—p. 609.
- Blood Picture in Brucellosis: Preliminary Report. Myrtle Munger and I. F. Huddleson, East Lansing, Mich.—p. 617.
- Relationship Between Agglutinability and Certain In Vitro Tests of Staphylococci, Streptococci and Colon Bacilli Isolated from Persons Suspected of Having Chronic Infection. M. H. Stiles, Philadelphia, and G. H. Chapman, New York.—p. 620.
- Sodium Dehydrocholate Solution as Solvent for Neosarsphenamine in Treatment of Syphilis. C. Shaw, Chicago.—p. 624.
- Intradermal Test as Aid in Diagnosis of Enterobiasis. H. Tsuchiya and T. C. Bauerlein, St. Louis.—p. 627.
- Determination of Hippuric Acid in Urine. T. E. Weichselbaum and J. G. Probst, St. Louis.—p. 636.
- Quantitative Determination of Urinary Estrogenic Hormone (Biologic Method): Consideration of Technique, Animal Colony and Laboratory Personnel. A. Palmer, San Francisco.—p. 643.
- Demonstration of Bacteriostatic Action of Sulfanilamide on Hemolytic Streptococci in Vitro. E. Neter, Buffalo.—p. 650.

Effects of Quinidine Sulfate in Children.—Messeloff studied the effects of various doses of quinidine sulfate on ten children with regular sinus rhythm, one with frequent and persistent premature auricular contractions and one with bundle branch block associated with congenital heart disease. The impairment of auriculoventricular and intraventricular conduction as well as a decrease in the amplitude of the positive T wave, phenomena noted in adult studies, are also seen in children. The principles of dosage and of cumulation governing the clinical use of the drug in children appear to be identical with those reported in adults. Intraventricular conduction in the child with the bundle branch block was not unduly impaired by quinidine. Children tolerate large doses of quinidine, as judged by the age and weight standards. The usual adult daily dose of from 15 to 30 grains (1 to 2 Gm.) may be safely given to children. However, the large doses should be controlled by frequent electrocardiograms. The principles underlying dosage and cumulation of quinidine established for adults apply equally to children.

Effects of Tobacco Smoking on Health.—In an attempt to learn what, if any, symptoms are produced in comparatively healthy ambulatory persons by the use of tobacco, Short and his co-workers asked an unselected group of insurance policy holders to fill out a questionnaire, at the time of their periodic health examination, designed to elicit their practices with reference to the use of tobacco, but contained no reference to physical signs or symptoms. The latter information was obtained independently from the physical examination and medical history, which were recorded separately. Of 2,031 persons studied, 1,292

habitually used tobacco, 496 were nonusers, 104 used it only occasionally and 139 were former users who had discontinued the practice. Symptoms relating to the respiratory, circulatory, gastrointestinal and nervous systems were definitely increased among smokers. These increases ranged from 50 per cent for palpitation of the heart to 300 per cent for cough. The increased tendency to dyspnea on exertion in smokers gives point to the tabu on tobacco by many athletic directors, especially the trainers of pugilists. The relationship of tobacco smoking to gastric disturbances, especially hyperacidity, is a frequent clinical observation. For this reason sufferers from gastric or duodenal ulcers are usually asked to refrain from tobacco. In this study "heartburn" was increased by 100 per cent, and other digestive symptoms from 62 to 112 per cent. There was no significant variation between the smokers and nonsmokers in weight, pulse rate or blood pressure. Tremors appeared to be diminished in the smoking group. However, there was a tendency for tremors to be increased if habitual users were deprived of tobacco for a time; also blood pressures tended to vary considerably during the actual process of smoking. Seventy-eight of the 139 persons who gave up smoking did so for reasons of health.

Reactions to Tobacco Smoke and Epinephrine.—Short and Johnson made a direct comparison of the effects of epinephrine injection with those of tobacco smoking. Their observations, they state, confirm the view that the characteristic effects on pulse, blood pressure, peripheral cutaneous temperature and blood sugar of tobacco smoking can be explained by an increased output of epinephrine. This most probably is the result of a stimulating effect of nicotine on the sympathetico-adrenal system.

Journal of Neurophysiology, Springfield, Ill.

2: 101-172 (March) 1939

- Course of Recovery of Spinal Cord from Asphyxia. A. van Harreveld and G. Marmont, Pasadena, Calif.—p. 101.
Cortical Response to Sensory Stimulation Under Deep Barbiturate Narcosis. A. Forbes and B. R. Morison, Boston.—p. 112.
Search for Changes in Direct Current Potentials of the Head During Sleep. H. Davis, P. A. Davis, A. L. Loomis, E. N. Harvey and G. Hobart.—p. 129.
Influence of Anoxia on Pupillary Reflexes in the Rabbit. B. Ury and E. Gellhorn, Chicago.—p. 136.
Factors Controlling Brain Potentials in the Cat. H. H. Dubner and R. W. Gerard, Chicago.—p. 142.
Control of Potential Rhythm of the Isolated Frog Brain. B. Libet and R. W. Gerard, Chicago.—p. 153.
Brain Wave Frequencies and Cellular Metabolism: Effects of Dinitrophenol. H. Hoagland, M. A. Rubin and D. E. Cameron, Worcester, Mass.—p. 170.

Journal of Urology, Baltimore

41: 265-434 (March) 1939. Partial Index

- Nephrostomy: Indications and Technic. R. C. Graves and W. T. Buddington, Boston.—p. 265.
Surgical Treatment of the Horseshoe Kidney. J. E. Strode, Honolulu, Hawaii.—p. 285.
Neuroblastoma of Adrenal Gland. S. Malisoff, New York.—p. 296.
Adrenal Heterotopia: Survey of Literature and Report of Case. O. S. Culp, Baltimore.—p. 303.
Etiology and Treatment of Renal Lithiasis. G. R. Livermore, Memphis, Tenn.—p. 310.
End Results in Renal and Ureteral Calculi. F. J. Parmenter, Buffalo.—p. 320.
Sacculated Aneurysm of Abdominal Aorta Operated for Perinephric Abscess. R. L. Davis, San Antonio, Texas.—p. 332.
Nephroptosis. G. W. Fish and C. T. Hazzard, New York.—p. 336.
*Transurethral Operations on Women for Relief of Dysfunction of Vesical Neck. G. J. Thompson, Rochester, Minn.—p. 349.
Surgical Removal of Vesical Calculus: Experimental and Clinical Study. F. P. Twinn, New York.—p. 360.
Clinical Study of Forty-Nine Cases of Urinary Calculi Requiring Surgery. C. H. deT. Shivers and K. P. Henderson, Atlantic City, N. J.—p. 366.
Hemorrhage into the Bladder in Polycythemia Vera: Report of Case. A. Kemble, Washington, D. C.—p. 397.
*Use of Vitamin C in Treatment of Essential Hematuria: Preliminary Report. C. E. Burkland, Baltimore.—p. 401.
Prostatic Hypertrophy as Part of Generalized Metabolic Disease: Evidence of Presence of Lipopenia. E. M. Boyd and N. E. Berry, Kingston, Ont.—p. 406.
Diagnostic Value of Residual Urine Estimation. T. J. Kirwin and G. A. Hawes, New York.—p. 413.

Transurethral Operations for Dysfunction of Vesical Neck.—Thompson performed thirty-five transurethral operations for dysfunction of the vesical neck among twenty-four women. The etiology of this disease is not definitely revealed by microscopic study of the tissue removed at operation. The

hypothesis that it is caused by fibrosis in the sphincteric region seems fallacious in view of the fact that a considerable amount of fibrosis is found in normal tissue from this region. A possible explanation is that hyperplasia of the superficially lying epithelium or of the sphincter muscle occurs and causes urinary retention. The results of operation were excellent in fourteen cases, good in five, fair in four and poor in one. Removal of tissue from the entire circumference of the vesical neck is necessary to obtain a good result in all but exceptional cases in which only incision might suffice. The patient should be observed for a number of years following operation, and treatment including dilation with a Kollmann dilator will probably be necessary in some cases in order to maintain normal vesical function; the transurethral operation can be repeated with benefit if urinary obstruction recurs.

Vitamin C and Essential Hematuria.—Burkland used vitamin C in the treatment of four cases of essential hematuria. There was no evidence of scurvy or gross vitamin C deficiency in the four patients, except possibly in one who had colitis and diarrhea for some time. Yet the hematuria, which in each case had been present for several weeks, disappeared after the patients were given intravenous injections of vitamin C in the form of the sodium salt of ascorbic acid in sterile water. The dosages were arbitrarily chosen and therefore varied in patients from 100 to 300 mg. daily. A decrease in the hematuria occurred on the oral administration of vitamin C in the form of ascorbic acid tablets and fruit juices, but the intravenous administration was necessary to produce a more rapid, dramatic response. This was probably because on oral medication the absorption is delayed and is often faulty. It is the author's opinion that the vitamin C stopped the hematuria through its ability to cause alteration in capillary permeability, but, in addition, other actions reputed to it, such as increasing the coagulability of the blood, stimulating epinephrine secretion and acting as a catalyst for cellular metabolism, may have played some part in causing cessation of the hematuria. The effect may also be due to the fact that in the utilization of vitamin C by the body a large amount of it is excreted by the kidneys, leading to a high concentration in these organs. In view of the efficacy of the treatment, cases of essential hematuria might be considered as subclinical forms of vitamin C deficiency.

Kentucky Medical Journal, Bowling Green

37: 89-128 (March) 1939

- The Problem of Chronic Disease. A. Bell, Hopkinsville.—p. 89.
Hodgkin's Disease in Childhood. Margaret A. Limper, Louisville.—p. 97.
Immediate Repair of Perineal Lacerations. N. M. Garrett, Brodhead.—p. 102.
Lobar Pneumonia. N. Sugarman, Sneedville, Tenn.—p. 106.
Management of Obesity. G. Fulton and E. C. Humphrey, Louisville.—p. 110.
Headache. C. F. Long, Elizabethtown.—p. 116.
Postpartum Hemorrhage. S. H. Starr, Louisville.—p. 120.

Maine Medical Association Journal, Portland

30: 45-68 (March) 1939

- The Doctor's Dilemma When and If the Government Goes into the Practice of Medicine in a Big Way. R. I. Lee, Boston.—p. 45.
Treatment of Genito-Urinary Infections with Sulfanilamide. G. A. Schneider and M. J. Harkins, Lewiston.—p. 52.
Two Unusual Foreign Body Cases. E. L. Pratt, Lewiston.—p. 54.

Minnesota Medicine, St. Paul

22: 145-216 (March) 1939

- Significance of Normal Blood Sugar in Treatment of Diabetes Mellitus. J. R. Meade, St. Paul.—p. 145.
Acute Surgical Conditions of the Abdomen. J. M. Hayes, Minneapolis.—p. 147.
Torsion of the Omentum and Appendices Epiploicae: Report of Two Cases. B. F. Davis, Duluth.—p. 151.
Rating of Disabilities. M. O. Henry, Minneapolis.—p. 154.
Surgical Clinics of Europe: Some Personal Observations Made in 1937, 1938. L. Sperling, Minneapolis.—p. 157.
Indications for Cesarean Section. R. J. Moe, Duluth.—p. 163.
*Progesterone in Treatment of Habitual Abortion. S. B. Peters, Silver Creek, N. Y.—p. 166.
Human Hereditary Defects. E. J. Engberg, Faribault.—p. 169.
*Mumps Meningo-Encephalitis. T. L. Birnberg, St. Paul.—p. 173.

Progesterone for Habitual Abortion.—During the last year Peters has treated four cases of recurrent spontaneous abortion. The patients delivered normal living infants at term. As soon as the diagnosis of pregnancy was made and up to and

including the fifth month of pregnancy the patients received biweekly intramuscular injection of progesterone or corpus luteum extracts amounting to approximately 1 international unit. In all cases the blood Wassermann reactions were negative and nothing in the history, physical examination or laboratory data could be found to account for the abortions. No definite conclusions can be stated, but the author makes the suggestion that progesterone is a specific for a certain type of quite common recurrent abortion and premature labor, a view which is corroborated by experimental studies.

Mumps Meningo-Encephalitis.—During a period of five and a half years Birnberg has encountered thirty-eight cases of mumps meningo-encephalitis in private practice. So large an incidence, with no coincidental unusual mumps epidemic, leads him to consider mumps as a disease in which meningeal symptoms appear relatively often, and in the preadolescent age group it has been the most frequent complication that he has observed. The specific cause of mumps meningo-encephalitis would seem to be either the mumps virus or a toxin liberated by the virus. The clinical symptoms of mumps meningo-encephalitis may appear at from one to ten days after the onset of the parotitis. Occasionally the meningitis and parotitis develop simultaneously, as in one of the present cases. The neurologic symptoms in rare instances precede the parotitis by several days. There are some cases in which the meningo-encephalitis would appear to be of undoubted mumps origin by virtue of epidemiologic contact but in which a parotitis never occurs or is so slight as to pass unnoticed. The symptomatology, as observed in the thirty-eight cases, shows a fair degree of uniformity. The presenting symptom is almost invariably headache, often quite intense. Vomiting occurred in practically all cases but was usually not incessant and persisted for only one or two days. All patients had varying degrees of fever. Hiccup, lethargy or irritability were inconstant and usually not pronounced symptoms. Rarely dilated pupils may be an index of cerebral involvement. Convulsions and focal paralysis have been recorded but the author did not observe them in his cases. Neurologic examination almost always reveals rigidity of the neck and a positive Kernig sign. The diagnosis rests largely on the recognition that such a complication does occur. The relatively mild symptoms with a rather high cell count are a valuable diagnostic criterion. The treatment of mumps meningo-encephalitis is chiefly symptomatic. Spinal puncture should be performed as a diagnostic procedure; it is often of value in reducing fluid pressure, particularly in patients with persistent headache and vomiting. Mumps meningo-encephalitis persists for from three to eleven days. The temperature returns to normal and the subjective symptoms clear up two or three days before the neurologic signs become normal.

Missouri State Medical Assn. Journal, St. Louis

36: 99-142 (March) 1939

- The Third Stage of Labor, with Special Reference to Postpartum Hemorrhage, Placenta Accreta and Inversion of the Uterus. E. L. Dorsett, St. Louis.—p. 99.
- Some Complications of Pregnancy and Labor in General Practice with Treatment. J. D. James, Springfield.—p. 102.
- Office Management of Ambulatory Gynecologic Patients. R. R. Wilson, Kansas City.—p. 105.
- Pyelitis of Pregnancy. C. E. Burford, St. Louis.—p. 108.
- Vomiting of Pregnancy: Outline of Rational Therapy. C. R. Wegner, St. Louis.—p. 109.
- Tuberculosis in Pregnancy. A. C. Henske, St. Louis.—p. 111.
- Heart Disease and Pregnancy. J. Jensen, St. Louis.—p. 112.
- Appendicitis in Pregnancy. D. Sauer and F. Bailey, St. Louis.—p. 113.
- Pregnancy and Rectal Diseases. W. K. McIntyre, St. Louis.—p. 114.
- Pregnancy and the Skin. C. W. Lane, St. Louis.—p. 115.
- Relationship of Prenatal Nutrition to Fetal Tooth Development. A. O. Gruebel, Jefferson City.—p. 117.
- Rocky Mountain Spotted Fever: Report of Case. J. Zahorsky, St. Louis.—p. 118.
- Nupercaine: Its Place in Urologic Practice. N. F. Ockerblad and H. E. Carlson, Kansas City.—p. 120.
- Pyelitis Due to *Bacillus Dysenteriae* (Flexner), with Response to Sulfanilamide. A. C. Van Ravenswaay, Boonville.—p. 122.
- Head Injuries and Their Mental Sequelae. E. T. Gibson, Kansas City.—p. 123.
- Acute Retrocecal Appendicitis: Clinical Sign of Diagnostic Value. V. T. Williams, Kansas City.—p. 126.
- Factors Influencing the Birth Rate and Maternal and Infant Mortality Rates in Missouri. J. W. Chapman, Jefferson City.—p. 127.

Nebraska State Medical Journal, Lincoln

24: 81-120 (March) 1939

- Diagnosis and Management of Peripheral Vascular Disease. G. de Takats, Chicago.—p. 81.
- Prevention and Early Diagnosis of Rheumatic Heart Disease. C. J. Lundy, Chicago.—p. 83.
- Gastroscoy in Diagnosis of Diseases of the Stomach. R. R. Best and A. M. Popma, Omaha.—p. 86.
- Acute Appendicitis with Perforation. J. Weinberg, Omaha.—p. 89.
- Newer Developments in Child Nutrition. P. C. Jeans, Iowa City.—p. 92.
- Anorexia. A. G. Dow, Omaha.—p. 96.
- Nutrition as Affected by the Economic Level. G. E. Robertson, Omaha.—p. 98.
- Treatment of the "Refractory" Anemias. J. C. Sharpe and S. G. Rathburn, Omaha.—p. 103.
- Hysteria: Exposition of the Theory of T. A. Ross. R. F. Richie, Lincoln.—p. 107.

New England Journal of Medicine, Boston

220: 269-314 (Feb. 16) 1939

- Experimental Studies Concerning the Nature of Hypertension: Their Bearing on Surgical Treatment. S. J. G. Nowak and I. J. Walker, Boston.—p. 269.
- Pelvic Sympathetic Surgery for Relief of Bladder Pain: Resection of Superior Hypogastric Plexus and Lateral Sacral Sympathetic Ganglions in Tuberculous Cystitis. C. F. Schroeder, Detroit.—p. 274.
- Various Methods of Determining the Early Diagnosis of Arteriosclerosis in Diabetes. L. I. Kramer, Providence, R. I.—p. 278.
- *Alcohol Tolerance Tests in Normal Individuals and in Patients with Diabetes Mellitus and Diabetes Insipidus: Effect of Pituitrin, Insulin, Food and Forced Water on Blood and Urine Alcohol Levels After the Ingestion of Alcohol. H. Blotner, Boston.—p. 283.
- Abdominal Surgery. A. W. Allen, Boston.—p. 290.

Alcohol Tolerance Tests in Normal and Diabetic Persons.—Blotner discusses the results of some alcohol tolerance tests that he performed on normal persons and on patients with diabetes insipidus and diabetes mellitus following the ingestion of 0.6 cc. of absolute alcohol per kilogram of body weight. He also studied the effect of insulin, solution of posterior pituitary, food and forced water intake on these tests. Symptoms of alcoholic intoxication appeared in these people when the alcohol concentration of the blood and the urine were below 63 mg. per hundred cubic centimeters, in comparison to the much higher levels reported by others. Alcohol curves of the blood and the urine after a test meal were slightly higher in patients with diabetes insipidus than in normal persons. Solution of posterior pituitary reduced the alcohol levels of the blood and the urine in both these groups; nevertheless it increased considerably the symptoms of alcoholic intoxication in the former. In the patients with diabetes mellitus the alcohol levels of the blood and the urine were appreciably higher than normal, although the symptoms of alcoholic intoxication were much the same. The administration of insulin had no effect on the alcohol curves or on the symptoms of alcoholic intoxication. An alcoholic odor on the breath may cause confusion in the diagnosis of coma due to insulin or acidosis. The ingestion of food before the ingestion of alcohol produced a striking decrease in the alcohol levels of the blood and urine and in the symptoms of alcoholic intoxication in diabetic patients. The diuresis resulting from forced water intake and uncontrolled diabetes insipidus did not dilute the concentration of alcohol in the urine but increased the total amount of alcohol excreted in it. Nevertheless, forcing water in the case of an alcoholic patient would not produce any appreciable results in therapy, because the total alcohol eliminated by this method is small compared to the amount ingested.

220: 315-364 (Feb. 23) 1939

- Experiences with Gastrectomy, Total and Subtotal. F. H. Lahey, Boston.—p. 315.
- David Williams Cheever. F. B. Lund, Boston.—p. 321.
- Surgical Diseases of the Extrahepatic Bile Ducts. I. S. Ravdin, Philadelphia.—p. 326.
- Use of Vinyl Ether (Vinethene) in Infancy and Childhood: Report of 100 Cases. R. E. Gross, Boston.—p. 334.
- *Use of Specific Serums in Treatment of Pneumonias Associated with Pneumococci of the "Higher" Types. M. Finland, Boston.—p. 336.
- Gastro-Enterology. C. M. Jones, Boston.—p. 339.

Serums for Pneumonias of "Higher" Types.—Finland believes that type V, VII and VIII pneumonia is sufficiently prevalent to make it possible to accumulate significant numbers of cases within a reasonable time to indicate the efficacy of any therapy. Pneumonias due to the "higher" types may be quite atypical in their symptomatology and in the character of the

pulmonary lesions produced. This is in sharp contrast to types I and II, which except in rare cases are associated with typical lobar pneumonias. Thus a small percentage of cases of type V pneumonia are atypical, but among those due to types VII and VIII, particularly the latter, the disease may be atypical in a considerable proportion of cases. The experience of all observers who have treated any appreciable number of cases of type V pneumonia with serums has been uniformly favorable. In most clinics, including the Boston City Hospital, the results as judged by the reduction in mortality and the occurrence of rapid clinical improvement have been comparable to those obtained in type I cases or even better. Experiences with type VII and VIII cases, on the other hand, have varied widely; most of them have been favorable, and the mortality in specifically treated cases has been lower than that of non-serum treated cases. One may also include type XIV pneumonia in infants and young children among those which have given favorable results in clinics in which serum has been used extensively. There are many fundamental reasons underlying the differences in result, and these are in no way different from the circumstances previously encountered in type I and II cases. Therefore every effort should be made to acquire the necessary basic information with regard to the frequency of the various types in pneumonia, the bacteremic incidence, the death rates among the various types of pneumonia and the occurrence of the same types of pneumococci in the respiratory tract under other conditions. In acutely sick patients with good sputum raised from the bronchi, particularly if it is rusty, the discovery of a given type as the only or definitely predominating organism is adequate indication for specific serum, and its proper employment will probably increase the chances of rapid recovery. Further experience may reveal that certain of the types are more regularly and intimately related to pneumonia than are others. Already it appears that a greater proportion of types IV, XII and XVIII pneumococci, for example, are causative agents in pneumonia than are those of types VI, X, XX and types "higher" than XX. This is only relatively true, however, since probably every type may cause severe and even fatal pneumonia under the proper circumstances or in a particular individual.

New York State Journal of Medicine, New York

39: 401-438 (March 1) 1939

- Topical Application of Vitamin A: Efficiency Judged by Growth Stimulation. W. H. Eddy and Joan L. Howell, New York.—p. 406.
Afterpains. S. B. Blakely, Binghamton.—p. 411.
Clinical Experiences with Sulfanilamide Therapy, with Special Reference to Toxic Effects. R. Ottenberg, New York.—p. 418.
General Paresis: Biologic and Serologic Variants Affecting Results of Treatment. B. Pollack, Rochester.—p. 431.
Carcinoma of Rectum and Colon: Early Diagnosis and Treatment. F. C. Yeomans, New York.—p. 439.
*Chancroid: Comparative Study of Ito Test Made with Three Vaccines. H. C. Saunders, O. Canizares and R. F. Reider, New York.—p. 447.
Therapeutic Use of Bacteriophages, Particularly in Sepsis. W. J. MacNeal, New York.—p. 451.

Ito Test for Chancroid.—Saunders and his associates believe that the Ito test, performed with vaccines of Ducrey streptobacilli, is specially valuable in the diagnosis of long-standing chancroids. In the majority of these phagedenic lesions, in which autoinoculations are usually negative, the Ito test is always positive. The negative autoinoculations in these cases are probably due to the overgrowth of the Ducrey streptobacillus by common pyogenic bacteria. They substantiate the opinions of other observers that the Ducrey vaccine is satisfactory as a diagnostic test in the majority of cases. In a comparison of Greenblatt's vaccine with dmelcos, 180 tests were performed on eighty-six individuals. The tests were positive in forty-four cases and negative to both vaccines in forty-six cases. In twenty-six of the positive cases the two vaccines gave equal reactions. Greenblatt's vaccine gave stronger reactions than dmelcos in four cases and weaker reactions in sixteen cases. A comparison of an American commercial vaccine with dmelcos (sixty-two tests on twenty-seven persons) gave nineteen negative and twelve positive reactions with both vaccines. In five of the positive cases the two vaccines gave equal reactions. The commercial vaccine was stronger in one case and weaker in six cases. In comparing the three vaccines, 360 tests were performed on 112 persons; seventy-six gave negative reactions to all vaccines, forty-four gave positive reactions, of which twenty-

six were of equal intensity, and eight gave the strongest reaction with dmelcos, four with Greenblatt's and four with the commercial vaccine. When the reaction to dmelcos vaccine was negative, the other two vaccines also gave negative reactions. The differences in the positive reactions were slight and in no case of such a degree as to be of any practical value. Therefore the specificity of the two American Ducrey vaccines for the diagnosis of chancroidal infections is confirmed.

Psychoanalytic Quarterly, Albany, N. Y.

S: 1-138 (Jan.) 1939

- Notes on Identification in Case of Depression Reactive to Death of Love Object. M. W. Peck, Boston.—p. 1.
Character and Symptom Formation: Some Preliminary Notes with Special Reference to Patients with Hypertensive, Rheumatic and Coronary Disease. F. Dunbar, New York.—p. 18.
Observations on World Destruction Fantasies. W. J. Spring.—p. 48.
Problems of Psychoanalytic Technique. O. Fenichel, Los Angeles.—p. 57.
Schopenhauer and Freud: Comparison. W. Bischler, Geneva, Switzerland.—p. 88.
Contributions of Psychoanalysis to Education of the Adolescent. Caroline B. Zachry, New York.—p. 98.

Public Health Reports, Washington, D. C.

54: 287-334 (Feb. 24) 1939

- Studies of the Acute Diarrheal Diseases: I. Differential Culture Mediums. A. V. Hardy, J. Watt, T. M. De Capito and M. H. Kolodny.—p. 287.
Clegg's Ameba Culture Method for Growing Mycobacterium Leprae. Florence L. Evans.—p. 301.
*Glucose Tolerance in Rheumatic Fever. M. P. Schultz.—p. 305.

54: 335-372 (March 3) 1939

- Preventive Clinic Facilities Available in Ninety-Four Selected Counties of the United States. A. J. Borowski and Margaret Lovell Plumley.—p. 335.
Catalytic Potency of Blood in Rheumatic Fever. M. P. Schultz and Edythe J. Rose.—p. 343.
Study of Quartz-Fusing Operations, with Special Reference to Measurement and Control of Silica Fumes. E. C. Riley and J. M. DallaValle.—p. 352.

Dextrose Tolerance in Rheumatic Fever.—Schultz obtained curves indicating the degree of dextrose tolerance in ten patients with rheumatic fever and fourteen with various febrile diseases. In none of the patients is it apparent that the patient with rheumatic fever, in comparison with those suffering from other febrile diseases, possessed an increased degree of dextrose tolerance. However, in comparison four rheumatic patients showed a relatively decreased dextrose tolerance. This may perhaps be accounted for by the occurrence of slightly higher temperatures in the rheumatic fever patients in some instances. In both groups temperatures had been closely comparable during preceding days and, with the exception of one comparison, the erythrocyte sedimentation rates agreed closely. On the basis of dextrose tolerance tests the author states that no association between rheumatic fever and hyperinsulinism is demonstrable.

Rhode Island Medical Journal, Providence

22: 39-56 (March) 1939

- Relation of Household Dusts to Asthma in Childhood. W. P. Buffum and S. S. Freedman, Providence.—p. 42.

Rocky Mountain Medical Journal, Denver

36: 145-216 (March) 1939

- *Common Animal Parasites Transmissible to Man. E. R. Mudge, Denver.—p. 162.
Newer Methods of Treatment in Psychiatry. C. H. Barnacle, Denver.—p. 164.
Brain Tumors with Focal Symptoms. L. E. Daniels, Denver.—p. 168.
Surgical Problems of the Gallbladder and Bile Ducts. A. S. Jackson, Madison, Wis.—p. 171.
Heart Disease in Colorado. E. Durbin, Denver.—p. 173.

Common Animal Parasites Transmissible to Man.—Endamoeba histolytica, Trichomonas hominis, Ascaris lumbricoides and Enterobius vermicularis, according to Mudge, are endemic in the vicinity of Colorado and he believes that more frequent stool examinations in the laboratory would undoubtedly disclose other parasites. Animal parasites seldom seen now may be encountered in the future owing to the increasing use of rapid transportation, the airplane particularly. Any person coming from a country in which animal parasites are prevalent is potentially a carrier. Animals or birds brought in, or even the airplane, automobile, ship or baggage can also

act in a similar way. With rapid transportation the incubation period for development of the parasite may extend beyond the time of arrival of the host at his destination, with subsequent development of symptoms not diagnosed unless this possibility is considered. A few cases of malaria have been seen at Colorado General Hospital with symptoms developing after the person's return to Colorado from the South. The United States Public Health Service considers this possibility a definite problem, and its personnel inspects both passengers and airplanes on all commercial airlines coming into this country. The Army and Navy medical corps also consider animal parasites of major importance in their problems on health and sanitation and their medical schools stress this subject. Other governmental departments are also active on this public health problem of parasite control, which the medical profession in general practice has largely slighted.

South Carolina Medical Assn. Journal, Greenville

35: 57-82 (March) 1939

Present Status of Prostatic Surgery. L. P. Thackston, Orangeburg.—p. 57.
Dr. John Moultrie of Charles Town. P. Rucker, Richmond, Va.—p. 60.
Congenital Vomiting—Causes and Treatment. W. Weston Jr., Columbia.—p. 62.

Southern Medical Journal, Birmingham, Ala.

32: 233-340 (March) 1939. Partial Index

Treatment of Carcinoma of the Cervix Uteri: Tissue Changes During and Following Radiation Therapy. J. C. King and W. W. Brandes, Memphis, Tenn.—p. 233.
Improved X-Ray Technic in Studying Knee Joints. E. C. Holmblad, Chicago.—p. 240.
Tuberculosis and Tuberculids. H. S. Alden and J. W. Jones, Atlanta, Ga.—p. 256.
Exercise Tolerance Test (Master and Oppenheimer) in Estimation of the Capacity of the Diseased Heart. B. R. Heninger, New Orleans.—p. 262.
Thermophore Treatment of Retinal Detachment. L. T. Post, St. Louis.—p. 273.
Conservative Management of Sinuses. J. W. Jervey Jr., Greenville, S. C.—p. 278.
Surgical Aspects of Chronic Sinusitis. W. R. McKenzie, Baltimore.—p. 283.
Lye Poisoning and Stricture of the Esophagus: Report of Fifty Cases. J. M. Martin and J. M. Arena, Durham, N. C.—p. 286.
Lobar Pneumonia. D. R. Sacks and L. Rice, San Antonio, Texas.—p. 294.
Mode of Action of Sodium Sulfoeyanate in Reducing Hypertension: Report of Its Effect on the Erythrocytes. H. M. Doles, Norfolk, Va.—p. 299.
Cancer, Trauma and Compensation. E. L. Bishop, Atlanta, Ga.—p. 302.
Clinical Correlates of Functional Uterine Bleeding. E. C. Hamblen, Durham, N. C.—p. 308.
Hemorrhage in Pregnancy, with Brief Analyses of Cases of Hemorrhage During the Last Ten Years at the University and St. Anthony Hospitals in Oklahoma City. W. W. Wells, Oklahoma City.—p. 319.
Syphilis and Life Insurance. T. W. Murrell and R. C. Manson, Richmond, Va.—p. 322.
Treatment of Dermatoses of Intestinal Origin with Castor Oil and Sodium Ricinoleate. A. G. Schoch, Dallas, Texas.—p. 326.
Premortory Pain in Coronary Artery Occlusion. W. Langston, Oklahoma City.—p. 333.

Action of Sodium Thiocyanate on Hypertension.—Doles studied the value of the thiocyanates by giving ten patients with hypertension and macrocytosis a general diet with an intake of 30 mg. of iron daily through food and water. After the fifth day the output of iron in twenty-four hours was estimated in the stools and urine for four days. The average daily output was from 14.5 to 16 mg. The patients were then given a diet in which the maximal intake of iron in twenty-four hours did not exceed 7.5 mg. and after the fifth day quantitative determinations were made for five consecutive days. Only a faint trace of iron could be found in the stools and none in the urine. The same procedure was carried out with this diet being continued and the patient was given 3 drachms (12 Gm.) of sodium thiocyanate twice a day. From 12.5 to 24.5 mg. of iron, depending on the patient, was recovered in the stools and urine every twenty-four hours. As long as the patient showed a relatively high output of iron in the stools and urine there was a fall in the volume of packed cells with a corresponding fall in the blood pressure. However, four patients did not give up their iron readily; and it was many months before the macrocytosis or blood pressure responded. Contraindications to the use of thiocyanates are hypertension in which the cells are normocytic, normochromic, normocytic hypochromic, microcytic normo-

chromic or microcytic hypochromic, or in macrocytic hypertension which show an increase in the icterus index of 7 units or more without evidence of hepatic disease.

Castor Oil for Dermatoses of Intestinal Origin.

Schoch treated ten patients who had dermatoses presumably of intestinal origin with castor oil by mouth or a castor oil derivative (sodium ricinoleate and kaolin emulsion). In nine there was clinical evidence that prompt benefit resulted from the administration of castor oil or its derivative. Not the slightest benefit resulted from the administration of the castor oil in the remaining patient, even though the dermatosis was definitely intestinal in origin. Castor oil is probably more thorough in its cathartic action than the usually prescribed saline laxatives. The favorable influence that sodium ricinoleate apparently exerts in some cases is not clearly understood.

Surgery, Gynecology and Obstetrics, Chicago

68: 595-722 (March) 1939

*Multiple Primary Malignant Lesions. L. K. Stalker, R. B. Phillips and J. deJ. Pemberton, Rochester, Minn.—p. 595.
*Fate of Living and Dead Cartilage Transplanted in Humans. L. A. Peer, Newark, N. J.—p. 603.
Modern Surgical Treatment of Uterocoele. R. Gutierrez, New York.—p. 611.
Aseptic Necrosis of Bone: II. Infarction of Bones of Undetermined Etiology Resulting in Encapsulated and Calcified Areas in Diaphyses and in Arthritis Deformans. S. C. Kahlstrom, Bath, N. Y.; C. C. Burton, Dayton, Ohio, and D. B. Phenister, Chicago.—p. 631.
Diagonal Conjugate versus X-Ray Pelvimetry. A. L. Dippel, Baltimore.—p. 642.
Pnuwels' Reclination, Physiologic Reconstruction for Nonunion Fracture of Neck of Femur. G. J. Karfiol, San Francisco.—p. 648.
Technic of Mammoplasty in Conditions of Hypertrophy of the Breast. H. Gillies and A. H. McIndoe, London, England.—p. 658.
Accessory Renal Vessels: Their Influence in Certain Cases of Hydro-nephrosis. H. J. Jewett, Baltimore.—p. 666.
Intracranial Solitary Chondroma. J. Chorobski, J. Jarzynski and E. Ferens, Warsaw, Poland.—p. 677.
Acute Purulent Abscess of the Lung: III. Roentgenographic Features. A. S. W. Touroff and H. Neuhof, New York.—p. 687.
Operative Management of Fibromyomas in the Uterus at Term. C. P. Huber, Indianapolis, and H. C. Hesseltine, Chicago.—p. 699.
Jejunoplasty for Obstruction Following Gastro-Enterostomy or Subtotal Gastric Resection. C. L. Hoag and J. B. deC. M. Saunders, San Francisco.—p. 703.
Fractures of Neck of Femur Treated with Smith-Petersen Nail: Analysis of Seventy-Eight Cases During 1937. S. M. Leydig, St. Louis.—p. 713.

Multiple Primary Malignant Lesions.—From a review of the literature of the last twenty years, Stalker and his colleagues find that multiple primary malignant lesions occur more frequently than is generally suspected. They made a study of 2,500 cases of malignant lesions in which operation was performed at the Mayo Clinic during 1937. They found 113 instances of multiple primary neoplasms in this group of cases. In these cases there were 327 separate neoplasms; 167 involved the skin and lip, forty-seven of the neoplasms were situated in the gastrointestinal tract, forty-three in the mammary gland, twenty-seven in the ovaries and fourteen in the uterus or cervix, and twenty-nine were situated in various other parts of the body.

Fate of Living and Dead Cartilage.—Desiring to obtain more definite information concerning the fate of human cartilage grafts in human tissues, Peer performed the following experiments: 1. Six segments of cadaver cartilage preserved in alcohol were transplanted beneath the skin of six other human beings and removed for examination at intervals of from six months to two years. 2. Eight segments of living autogenous costal cartilage were buried beneath the skin of eight human beings and removed for examination at intervals of from six months to six years. All these grafts were transplanted without perichondrium. Dead cartilage grafts buried from nine and one-half months to two years showed progressive invasion by fibrous tissue and partial absorption. In contrast to this, autogenous rib cartilage grafts showed no invasion or absorption over the same period. Two late autogenous rib cartilage grafts buried for four and one half and six years, respectively, appeared as living cartilage. From the evidence found in these sections one may conclude that autogenous rib cartilage survives after transplantation as living cartilage and, up to periods as long as six years, neither increases nor decreases in size. Therefore autogenous rib cartilage is better material for plastic repair than dead, pickled cartilage.

Tennessee State Medical Assn. Journal, Nashville

32: 39-76 (Feb.) 1939

- Sulfanilamide: Review. E. H. Barksdale, Nashville.—p. 39.
 Medical Management of Chronic Gallbladder Disease. L. C. Sanders, Memphis.—p. 47.
 Intravenous Use of Morphine Sulfate in Treatment. B. R. Powers, Knoxville.—p. 50.

Virginia Medical Monthly, Richmond

66: 129-190 (March) 1939

- Early Diagnosis in Pneumonia. W. P. Adams, Norfolk.—p. 129.
 Diagnosis and Treatment of Lobar Pneumonia. D. G. Chapman, Richmond.—p. 132.
 Type III Pneumococcus Pneumonia: Report of Case Successfully Treated with Specific Serum. J. P. Kent, Altavista.—p. 136.
 Prevention of the Common Cold. J. R. Hamilton, Nassawadox.—p. 139.
 Bang's Disense. I. D. Wilson, Blacksburg.—p. 142.
 Roentgen Ray Examination of the Colon. W. P. Gilmer, Clifton Forge.—p. 143.
 Otogenic Acute Suppurative Arthritis. F. H. McGovern, Danville.—p. 146.
 *Acute Arsenic Poisoning. W. A. Porter, Hillsville.—p. 148.
 Snares and Pitfalls in Medicine as Shown in Review of Three Cases: Brilliant Results and Cures by Modern Medicine in Two Cases. W. E. Driver, Norfolk.—p. 151.
 Care and Feeding of the Newborn and the Premature from the Pediatric Point of View. J. B. Stone, Richmond.—p. 158.
 Myxedema. K. D. Graves, Roanoke.—p. 162.
 Value of the Periodic Health Examination. R. F. Simms, Richmond.—p. 164.
 Responsibility of the General Practitioner in Prevention of Mortality in Acute Abdominal Conditions. H. W. Smeltzer, Abingdon.—p. 169.
 Significance and Management of Ankle Edema. W. C. Reed, Richmond.—p. 171.
 Fish-Bone Perforating the Cecum Simulating Acute Appendicitis. W. Fry, Washington, D. C.—p. 173.

Acute Arsenic Poisoning.—Besides the usual treatment of arsenic poisoning Porter used 800 international units of vitamin B₁ daily. The salient feature in the patients receiving the vitamin was the absence of diarrhea. It is his belief that the use of vitamin B₁ has a definite place in the treatment of toxic neuritis from metal poisoning. Prompt improvement of neuritic pains occurred after the vitamin B₁ had been administered for only a few days.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

47: 55-106 (Feb.) 1939

- *Recurrent Hyperthyroidism: Likelihood of Recurrence in Relation to Preoperative Blood Iodine Level. R. B. Cattell and H. J. Perkin, Boston.—p. 55.
 Medical Aspects of Treatment of Toxic Goiter. J. H. Means, Boston.—p. 62.
 Microhistometric Method Applied to Thyrotropic Hormone Assay. P. Starr, R. W. Rawson, R. E. Smalley, E. Doty and Helen Patton, Chicago.—p. 65.
 Hyperinsulinism Due to Tumor of the Pancreas: Case Report. R. D. Forbes, C. F. Davidson and J. Duncan, Seattle.—p. 76.
 Varicose Veins in Pregnancy. A. M. McCausland, Los Angeles.—p. 81.
 Chronic Duodenal Obstruction: Two Case Reports. B. P. Mullen, Seattle.—p. 85.
 Tuberculous Subphrenic Abscess and Empyema with Perforation of Diaphragm: Report of One Case. H. N. Roback and J. N. Alley, Medical Lake, Wash.—p. 88.
 Fused Placentas Simulating Single Placenta. C. L. Wilson and A. C. Webb, Chicago.—p. 91.
 Surgical Approach to Hypertension: Division IV. F. M. Findlay, San Diego, Calif.—p. 94.

Recurrent Hyperthyroidism.—Cattell and Perkin relate the data of patients with recurrent or persistent hyperthyroidism observed at the Lahey Clinic in the last decade. They present evidence which suggests that the level of iodine in the blood in hyperthyroidism may be used as an index for determining the amount of thyroid tissue to be removed. Persistent hyperthyroidism results from not removing enough of the gland. Recurrent hyperthyroidism is a return of the primary disease at some time following operation, after an interval of complete relief from toxic symptoms. The causes of recurrent hyperthyroidism are as obscure as are the factors responsible for the original disease. From 1928 to 1937 inclusive subtotal thyroidectomy in one or more stages was performed on 4,956 patients. Of these patients 119 were later operated on for persistent hyperthyroidism and 187 for the recurrent type. The average time interval between the initial and second operation for persistent hyperthyroidism was two years and four months; for recurrent

hyperthyroidism it was seven years and eleven months. The authors believe that following the initial thyroid operation recurrent hyperthyroidism can be often prevented if the patient is watched carefully. Their patients are advised to refrain from work for from six to twelve weeks. Daily periods of rest, avoidance of stimulants and excitement are necessary. Careful follow-up examinations including a basal metabolism test are done every three months for one year and every year for five years. At these examinations minor complaints are treated and general means are employed for rehabilitation. Follow-up study has led the authors to conclude that the use of iodine following subtotal thyroidectomy for hyperthyroidism did not reduce the incidence of recurrent or persistent hyperthyroidism. A study of the preoperative and postoperative blood iodine levels in 256 cases of exophthalmic goiter has given them a means of predicting cases in which recurrence is likely to happen. This prediction can be made prior to the initial thyroid resection and accordingly is a guide in selecting those patients who should have the more radical thyroidectomy. A correlation exists between the blood iodine level and the duration of symptoms in patients with exophthalmic goiter. The blood iodine level tends to be elevated in cases with symptoms of hyperthyroidism for nine months or less. After symptoms have been present for one year or longer the blood iodine level is generally found to be within normal limits. A further insight into the iodine metabolism in exophthalmic goiter has been gained by estimating the concentration of iodine in the blood at intervals following operation. Of 256 cases studied, 100 were followed for one year. The blood iodine results in these patients show that each case can be classified into one of three groups. Group 1 consists of 170 patients with hyperthyroidism who had an elevated blood iodine before treatment was commenced. Following subtotal thyroidectomy the blood iodine was found to remain normal throughout the year during which they were followed. Fifteen patients showed transitory postoperative myxedema, while only one had recurrent hyperthyroidism. Group 2 consists of sixty-one patients with hyperthyroidism who had a normal preoperative blood iodine level and following subtotal thyroidectomy were found to have an increase in the concentration of iodine in the blood. The greatest elevation of blood iodine usually occurred six months after operation. After one year the level of iodine in the blood returned to normal. Two patients of this group had transitory hypothyroidism, while twelve had recurrent hyperthyroidism. Group 3 consists of twenty-five patients in whom the blood iodine level was normal preoperatively and was found to remain normal during the year following subtotal thyroidectomy. Only one patient had transitory postoperative myxedema. Therefore it appears that in order to decrease the rate of recurrence in group 2 it becomes necessary to do a more radical subtotal thyroidectomy in all patients having a normal blood iodine level preoperatively.

West Virginia Medical Journal, Charleston

35: 105-152 (March) 1939

- Pathogenesis of Low Back Pain. E. L. Compere, Chicago.—p. 105.
 Control of Tuberculosis in West Virginia. G. E. Gwinn, Beckley.—p. 116.
 Prevention and Modification of Measles. F. J. Holroyd, Princeton.—p. 121.
 Sulfanilamide Treatment of Undulant Fever. L. B. Hart, Beckley.—p. 126.
 Gout: An Ancient Wolf in Modern Sheep's Clothing. J. L. Wade, Parkersburg.—p. 128.
 Sulfanilamide in Treatment of Gonorrhea in the Female. A. P. Hudgins, Charleston.—p. 137.

35: 153-200 (April) 1939

- Nephropexy. G. F. McKim, Cincinnati.—p. 153.
 Hernia in Infancy. C. T. Thompson, Morgantown.—p. 158.
 Effect of Pulmonary Emphysema on the Heart. H. M. Korns, Iowa City.—p. 160.
 Maternal and Child Health Services Under the Social Security Act. Clara E. Hayes, Washington, D. C.—p. 164.
 Foregut—Triumph Entry to Conflict. N. B. Hendrix, Martinsburg.—p. 169.
 Reflections on the Diagnosis and Treatment of Coronary Occlusion. I. I. Hirschman and L. B. Gang, Huntington.—p. 179.
 Staphylococci Septicemia: Case Report. J. F. Morris, Huntington.—p. 186.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

51: 51-108 (Feb.) 1939

- *Pellagra in Great Britain Since 1934. J. H. T. Davies and H. G. McGregor.—p. 51.
Phytopharmacologic Index in Pemphigus: Note. F. W. Sansome and L. Forman.—p. 63.
Further Experimental Studies of Pemphigus. L. Fleck and F. Goldschlag.—p. 70.

Pellagra in Great Britain.—Davies and McGregor present a summary of the twelve cases reported as pellagra in Britain since 1934 and add four new cases seen by them. They believe that there is sufficient evidence to show that vitamin B₂ deficiency alone is not sufficient explanation for the occurrence of pellagra. Murray calls attention to the facts that maize is not inferior to rice or wheat in vitamin B₂ content, yet a rice diet rarely gives rise to pellagra, while a diet of maize often does, and that the consumption of yellow maize, in distinction to white, does not predispose to the disease. Again, many cases have been reported in which the diet previous to the onset of the disease was reasonably full and varied; the preponderance of the disease in the female sex also points to some additional factor besides vitamin deficiency. The former point is made much of by the exponents of the infective theory. The latter suggests the possible influence of the endocrines. Further, although Goldberger has shown that rat pellagra is purely a vitamin B₂ deficiency disease, variable only in relation to this deficiency, human pellagra shows an additional variation—a seasonal one. Sabry postulates a mother substance, or pellagratoxin, which is acted on by a ferment in the presence of sunlight to produce melanin. The mother substance is phenylalanine; he has identified the ferment as dopa-oxidase, which is present in maize and some other foods. Sabry injects thiosulfate, which, it is claimed, neutralizes the pellagratoxin. The exact part played by light, however, in producing the eruption is by no means clear. Crutchfield regards trauma of various kinds more important than any specific photodynamic action of the sun. Other substances besides vitamin B₂ are now known to have anti-pellagra properties. Chief among these is nicotinic acid. Though neither the maximal nor the minimal dose has been ascertained, the factor may well be administered in daily doses of 50 mg. Finally, there remains for discussion the possibility of an association between pellagra and Addison's disease. The connection has been proposed because of the frequent occurrence in pellagrins of symptoms suggestive of Addison's disease: hypotension, pigmentation, subnormal temperature, weakness and gastrointestinal upsets. According to Simpson, the situation may be epitomized as follows: 1. Vitamin deficiency might cause both pellagra and adrenal insufficiency in the same patient. 2. Adrenal insufficiency might occur in the course of pellagra as a sequel to malnutrition. 3. Pellagra might occur in the course of chronic Addison's disease as a sequel to the associated anorexia. In the present state of knowledge it would seem that no definite ruling can be given on the question of a direct etiologic association between the two conditions.

Edinburgh Medical Journal

46: 61-152 (Feb.) 1939

- *The Expectancy of Life After Ureteral Transplantation. H. Wade.—p. 61.
Field of Vision and Anatomy of the Visual Nerve Path. H. M. Traquair.—p. 83.
Tumors of the Lung, Mediastinum and Pleura. M. C. Tod.—p. 95.
Observations on the Virus of Influenza, with a View to Elaborating a Simple Diagnostic Test Whereby Its Presence in the Respiratory Tract of Man May Be Revealed. W. J. Tulloch.—p. 117.

Life Expectancy After Ureteral Transplantation.—Wade states that, in order to determine the expectancy of life after ureteral transplantation and to assess accurately how far, if at all, this has been shortened by the establishment of a cloaca, it is necessary to select patients in sound general health and free of disease, but in whom the urinary bladder was irreparably damaged by developmental error or accident. In this category are included certain cases of complete vesical exstrophy, sub-symphysal exstrophy and vesicovaginal fistula with destruction of the vesical sphincter from obstetric injuries or similar cause.

Cases are now available in which a sufficient period has elapsed since ureteral transplantation to enable one to estimate accurately the influence of this operation on the general health of the patient and the expectancy of life. In this connection the author cites four cases in which the ureters were transplanted into the pelvic colon for the congenital malformation of vesical exstrophy. They demonstrate conclusively to him that when ureteral transplantation has been successfully performed the patient is given not only comfort, happiness and good health but also the prospect of a natural length of life. His patients were operated on thirty, twenty-eight, twelve and eleven years ago, respectively. This shows that only in those persons in whom a congenital deformity or traumatic injury is being corrected ureteral transplantation is a relatively safe procedure and fully warranted in these distressing disabilities.

Journal of Hygiene, London

39: 1-90 (Jan.) 1939

- Streptolysins of Various Groups and Types of Hemolytic Streptococci: A Serologic Investigation. E. W. Todd.—p. 1.
Ventilation of Houses After Fumigation with Hydrogen Cyanide. A. B. P. Page, O. F. Lubatti and F. P. Gloyns.—p. 12.
Investigation on Seasonal Fluctuation of Vitamin C Excretion in Palestine. K. Guggenheim.—p. 35.
Note on the Percentage Loss of Calories as Waste on Ordinary Mixed Diets. E. P. Cathcart and A. M. T. Murray.—p. 45.
*Milk Epidemic of Scarlet Fever and Angina, Originating from a Milkmaid with Scarlatinal Otitis Media. E. J. Henningsen and J. Ernst.—p. 51.
Influence of Air Movement and Atmospheric Conditions on Heat Loss from a Cylindrical Moist Body. A. J. Canny and C. J. Martin.—p. 60.

Milk Epidemic of Scarlet Fever.—Henningsen and Ernst report a milk epidemic of scarlatinal angina. There were 118 cases of scarlet fever and about fifty cases of sore throat. The infection was spread through contamination of the milk from a milkmaid with purulent otitis media after nonrecognized scarlet fever. On cultivation, *Streptococcus pyogenes*, group A (Lancefield), type 3 (Griffith) was isolated from 108 of the patients and from pus from the ear of the milkmaid. The cows, on the other hand, and their milk were found to be normal. Inquiry into the conditions under which the milk was distributed to the consumers confirms the connection between the otitis media in the milkmaid and the epidemic of scarlet fever. The cases in this epidemic were mild, but still one patient died of complicating bronchopneumonia.

Journal of Laryngology and Otology, London

54: 61-120 (Feb.) 1939

- The History of Cancer of the Larynx. St. Clair Thomson.—p. 61.
Normal Hearing by Bone Conduction. A. Greenbaum, Phyllis Margaret Tookey Kerridge and E. J. Ross.—p. 88.

Journal of Tropical Medicine and Hygiene, London

42: 17-32 (Jan. 16) 1939

- The Ultraviolet Absorption Spectrums of Serums in Human Schistosomiasis. A. Hassan.—p. 17.
Brief Notes on Columbensis Fever: Report of Case. G. Scotti.—p. 19.
Diseases of the Skin in Negroes. L. J. A. Loewenthal.—p. 20.

42: 33-48 (Feb. 1) 1939

- *Treatment of Oriental Sore (Leishmaniasis Cutanea) with Fuchsin Paint. A. Castellani and G. Amalfitano.—p. 33.
Incidence of Bacterium Aerogenes and Intermediates in Human Feces. M. Mollari, W. A. Randall and R. Reedy.—p. 34.
Diseases of the Skin in Negroes. L. J. A. Loewenthal.—p. 36.

Treatment of Oriental Sore with Fuchsin.—Castellani and Amalfitano obtained satisfactory results with fuchsin paint in the treatment of three cases of cutaneous leishmaniasis. The fuchsin paint consists of 10 cc. of saturated alcoholic solution of basic fuchsin and 100 cc. of 5 per cent phenol solution. This is filtered and 1 Gm. of boric acid is added. After two hours 5 cc. of acetone is added, and still two hours later 10 Gm. of resorcinol is added. The solution is kept in dark stoppered bottles. The technic of treatment is as follows: For two days a dressing of boric acid (1 per cent) and resorcinol (1 per cent) is applied to the sore. The parts should be continuously kept moist with the lotion. This removes the crusts and scales present. Then the fuchsin paint is applied to the sore regularly twice a day and 2 cc. of the same solution is given intramuscularly every other day. The solution may also be injected into the nodule

and around it. Every eight or ten days the application of the fuchsin to the sore is discontinued for one or two days, when the boric acid and resorcinol dressing is again applied. The treatment effected a cure in the three cases reported in from two to three and one half months.

Lancet, London

1: 309-368 (Feb. 11) 1939

Treatment of Pneumonia with 2-(*p*-Aminobenzenesulfonamido) Pyridine (Sulfapyridine). A. L. Agranat, A. O. Dreosti and D. Ordman.—p. 309.

*Treatment of Chronic Myeloid Leukemia: Importance of the Myeloblast. M. C. G. Israëls.—p. 317.

Torsion of the Appendix of the Testis. G. D. F. McFadden.—p. 320.

Aneurysm of Both Popliteal Arteries. C. Flemming.—p. 322.

*Urea Clearance in Hematemesis. D. A. K. Black.—p. 323.

Excretion of Injected Aneurin (Vitamin B₁). J. Marrack and Helga Franziska Höllering.—p. 325.

Intraperitoneal Rupture of Rectum. T. A. James.—p. 326.

Treatment of Chronic Myeloid Leukemia.—Israëls cites seven cases of chronic myeloid leukemia in which myeloblasts appeared in the peripheral blood. When the patient with this disease has not received treatment, the presence of myeloblasts is not of serious significance if they disappear when roentgen therapy is begun. If they increase, the outlook is grave, irrespective of any changes in the total leukocyte count. When myeloblasts appear during treatment, they usually signify that roentgen therapy is no longer effective and that, whatever the total leukocyte count, death is imminent. The completeness of the myeloblastic transformation in the bone marrow is parallel to that in the peripheral blood. The effectiveness of treatment is best judged by the diminution of the proportion of immature leukocytes and by the improvement in the anemia. The anemia should be thoroughly treated and roentgen therapy may be postponed provided the immature leukocytes do not increase and the patient's clinical condition warrants it.

Urea Clearance in Hematemesis.—Black studied the renal function in twelve cases of gastrointestinal hemorrhage. The severity of the condition of some of these cases precluded the adoption of any disturbing procedure and principal reliance was placed on the urea clearance test of Van Slyke. In most of the cases there was a moderate or even a pronounced lowering of urea clearance; after a week the clearance usually rose to within normal limits. A "scatter diagram" was constructed, showing the relationship of urea clearance to red cell volume. Although four of the cases showed considerable divergence, the remainder approximate a linear relationship. This indicates some degree of correlation, in the present cases, between the urea clearance and the red cell volume; the divergent values indicate that other factors besides the red cell volume influence the clearance—a fact which is hardly surprising when one considers the wide normal variation in urea clearance. No correlation appears to exist between the urea clearance and the blood pressure, hemoglobin or blood urea. After every allowance has been made for low protein intake and absence of diuresis, there is still evidence of diminished urea clearance in these cases. As pointed out by Van Slyke (1934), diminution of clearance must be due either to decreased renal blood flow or to less complete extraction of urea from the blood. The importance of blood flow is, however, suggested by the degree of correlation between the fall in clearance and the red cell volume. Estimations indicate some impairment of renal function. However, the present evidence is insufficient to establish definitely the mechanism of renal impairment.

Practitioner, London

142: 137-240 (Feb.) 1939

Midwifery and the General Practitioner. E. MacLean.—p. 137.

Antenatal Care in General Practice. W. H. F. Oxley.—p. 143.

Delayed Labor. A. Walker.—p. 153.

Diagnosis and Treatment of Disproportion. W. C. W. Nixon.—p. 163.

Management of the Puerperium and Its Minor Disturbances. A. H. Davidson.—p. 171.

Equipment and Instruments for Midwifery in General Practice. J. Beattie.—p. 179.

Diet in Health and Disease: XX. Breast Feeding. C. K. J. Hamilton.—p. 187.

Immediate Surgery in Air Raids: Work in a Casualty Clearing Station. P. H. Mitchiner.—p. 197.

Decompression of the Bladder. H. Bailey.—p. 207.

Psychologic Factor in General Practice. M. O. Raven.—p. 213.

Solutions Used in Injection Treatment of Hernia. M. Lee.—p. 221.

The Practitioner and His Accounts. G. Lowe.—p. 224.

Archives de Médecine des Enfants, Paris

42: 137-190 (March) 1939

*Agranulocytic Syndromes in Children. G. Paiseau, J. Ferroir and J. Gautier.—p. 137.

*New Orientations in Treatment of Bronchopneumonias of Nurslings. B. Soria.—p. 146.

Diagnosis of Kala-Azar by Sternal Puncture. S. Bartsocas.—p. 153.

Three Interesting Cases of Tuberculosis in Children. P. Rueda.—p. 155.

Treatment of Tuberculosis in Children. J. Comby.—p. 168.

Treatment of Bronchopneumonias in Nurslings.—

According to Soria, bronchopneumonia continues to be one of the diseases which have the greatest mortality rate in nurslings and young children. In nurslings its case fatality is more than 50 per cent. After pointing out that the mechanism of cellular and humoral defense is not yet organized in nurslings, the author discusses the various forms of bronchopneumonia such as the pulmonary, the cardiopneumonic, the gastrointestinal, the nervous and the toxic-infectious form. The treatment of bronchopneumonia has remained unchanged in recent years and it must be admitted that until now there has been no specific and efficacious treatment. Some use serums and vaccines, others employ inhalation of oxygen, others autohemotherapy and still others physical therapy. The author uses hypertonic solution of dextrose (from 15 to 20 per cent), which exerts a regulating effect on the disordered metabolism and stimulates the organs in general, particularly the muscular fibers of the heart, increasing the nutrition of the muscle and restoring the tonicity, which had been damaged by the action of the toxins. The disturbances in the acid-base equilibrium of the nurslings with bronchopneumonia lead to a generalized atonia of the entire musculature, by glycogenic insufficiency, which produces a disturbance in the respiratory function and impairs the return of the blood to the general circulation; the result of this is a hypotension which can be observed in several of the aforementioned forms of bronchopneumonia. Muscular hypotonia can be brought about by a diminution of dextrose in the blood stream, also by a diminution of glycogen in the muscles and likewise by a sympathetic phenomenon. The favorable action of dextrose solution on the muscular tonus cannot be doubted. The arterial tension increases after the second or third injection, the pallor and cyanosis change to an almost normal coloration, the dyspnea diminishes, the diuresis increases, the patient becomes quieter and sleeps better, the thirst subsides, the loss of weight is gradually arrested and the appetite returns. In the cardiac form the author observed in addition to the improvement of the general condition also a decrease in the cardiac dilatation. The volume of the congested liver decreased and the pain disappeared. In the nervous form the results were not quite as surprising but the general condition and the arterial tension improved and drainage by lumbar puncture rapidly counteracted the nervous phenomena. In the gastrointestinal form, sugared water in a quantity of from 600 to 700 cc. (20 per cent maltose and dextrin) produced excellent results. In the toxic-infectious form, however, the hypertonic solution of dextrose does not produce such favorable results because of the virulence of the infection. These cases may terminate in death in the course of forty-eight hours. Of the various modes of administration the author regards the intraperitoneal route as the most suitable, pointing out that the left iliac fossa is the best site. He employs a needle from 5 to 7 cm. in length. Shock is avoided by injecting the dextrose solution with 0.5 cc. of a 1:1,000 solution of epinephrine hydrochloride. From 150 to 200 cc. of the dextrose solution is administered daily. The author employed this treatment in more than 150 cases and, as a result, the mortality decreased by from 30 to 35 per cent.

Presse Médicale, Paris

47: 305-320 (Feb. 25) 1939

*Extraction of Projectiles and Foreign Bodies from Heart: Late Results (Twenty Years After.) R. Le Fort.—p. 305.

Rare Cases of Deviation of Cutaneous Allergy to Tuberculin in Tuberculous Children. G. Paiseau, J. Valtis and F. Van Deins.—p. 307.

*Xenopus Pregnancy Test. E. Elkan.—p. 308.

Extraction of Projectiles from Heart.—Le Fort points out that it is now permissible to reply to the questions so often asked during the war of 1914 to 1918 regarding the immediate and late dangers caused by the presence of pro-

jectiles in the heart or by their extraction from the heart. He reviews the clinical histories of patients who underwent extraction of foreign bodies or projectiles from the heart more than twenty years ago and then discusses the various aspects of the extraction, such as indications for it, dangers involved and technic. In the conclusion he stresses that the extraction of foreign bodies is possible from the walls as well as from the cavities of the heart. The presence of free projectiles in the cavities of the heart involves considerable dangers, so that their removal is advisable. However, it should be undertaken with all necessary precautions. The projectiles which are enclosed in the cardiac walls do not seem to cause grave dangers. They may remain buried in the muscle without provoking grave anatomic lesions, but their presence is often accompanied by serious functional disturbances. The extraction of projectiles from the anterior wall is a simple operation. However, the extraction of projectiles from the postero-inferior wall is a complex procedure and may become extremely difficult in cases of cardiopericardiac symphysis. The small projectiles may be abandoned, provided they are well tolerated. The large ones and those which cause complications should be removed. The danger caused by the presence of a projectile in contact with the large vessels of the heart is less grave than is imagined. The author says that he demonstrated twenty years ago that the vessels defend themselves ordinarily against metallic foreign bodies either by enveloping them in their wall or by isolating them by cellular cleavage. The indications for a surgical intervention should be carefully estimated in each case and the operation must be carried out with great care. All blind extraction procedures are prohibited. Generally the cardiac muscle is extremely adherent to the shell fragments. It must be separated with care and patience, fiber by fiber. Not only is it necessary to have a survey over the entire operative field but also it must be possible to enlarge the opening without delay. Every resection of rib or costal cartilage gives mediocre late results and leaves a weak or deformed area in the wall. Only those procedures should be used which permit a temporary removal of the ribs by section of their cartilages and of their intercostal spaces. A rigorously exact reparation of the wall must terminate the operation. The immediate surgical results are good and they persist in the course of years.

Xenopus Pregnancy Test.—Elkan says that the toad pregnancy test was first described by Hogben in 1930. He himself employed this pregnancy test last year 360 times, using 2,291 toads (*Xenopus laevis* Daudin) for this purpose. The test proper starts with the collection of urine. The patient is urged to limit the fluid intake as much as possible on the day before the specimen is collected so that the specific gravity of the urine will be high enough. The urine that is eliminated on the day following the restricted fluid intake has a specific gravity of from 1.020 to 1.030, and from 100 to 200 cc. of this urine is sent to the laboratory. It is more difficult to proceed with the test on urines with low specific gravity. Another factor is that the patient must not take any drugs on the day preceding the test. For injection into the dorsal lymph sac of the toads it is possible to use either 2 cc. of untreated urine or 1 cc. of extract, which is prepared according to Zondek's method of precipitation. After the injection the toads are placed in special jars, where they rest on perforated platforms so that they cannot eat their own spawn. For several hours the jars are kept at a temperature of 24 C. The most rapid positive result which the author observed was that oviposition took place four hours and fifty minutes after the injection. The usual time is from six to eight hours. Unfortunately the effect of the same urine on a series of six toads is not always uniform. However, the exactness of the xenopus pregnancy test does not seem to differ from that of the Aschheim-Zondek and Friedman tests. It permits the diagnosis of pregnancy in the early stages with less delay than do other biologic tests. The animals do not have to be killed to obtain the results; they can be used over again. The method is not more expensive than are other biologic pregnancy tests, and the technic is simple and free from error.

Schweizerische medizinische Wochenschrift, Basel

69: 189-211 (March 4) 1939. Partial Index

- Question of Tubal Sterilization. E. Baumann and O. Geiser.—p. 189.
*Blood and Bone Marrow in Bäng's Disease (Brucella Abortus Infection). N. Schmid.—p. 191.
Trial with Endovesical Ozonotherapy in Urinary Colibacillosis. M. Secrétan.—p. 193.
Pathogenesis of Chronic Hematogenous Disseminated Tuberculosis. W. Schlesinger.—p. 196.

Blood and Bone Marrow in Brucella Infection.—Schmid says that the diagnosis of *Brucella abortus* infection is based on the positive outcome of bacteriologic and serologic methods, namely (1) the demonstration of *Brucella abortus* in the blood culture or animal tests, (2) the demonstration of agglutinins in the serum and (3) the complement fixation test. In this paper the author gives especial attention to the morphologic aspects of the blood, pointing out that the blood picture in *Brucella abortus* infection resembles most that of abdominal typhoid. To be sure, this applies only to the leukopoiesis, for the erythrocytes are influenced only slightly or not at all, except that occasionally a mild, secondary anemia is observed. The leukocyte values may decrease to 2,500. Most frequently their number is between 3,000 and 6,000. Mononucleosis exists regularly and the lymphocytes and monocytes show a relative increase, but monocytosis is not as frequent as is lymphocytosis. Among the relatively reduced neutrophils, a deviation to the left is often noticeable and staff-nuclear cells appear. The eosinophils may disappear completely, but they are generally present in reduced numbers. As in typhoid, the leukopenia becomes more pronounced up to a certain point in the course of the disease; but, as recovery approaches, the blood picture becomes normalized. The monocytes behave differently than in typhoid, and the presence of neutrophils militates against typhoid and for *Brucella abortus* infection. With the exception of the cases that are complicated by hemorrhagic diathesis, the blood platelets remain unchanged. The sternal marrow shows chiefly a myelocytic and a promyelocytic composition, at least in the cases without complications. The author regards this medullary picture as indicative of a mild disturbance in maturation. The medullary changes are of no diagnostic significance. If complications arise in *Brucella abortus* infection, the blood picture shows a varying behavior. Since little is known regarding the bone marrow in complicated cases, the author gives a detailed report of such a case. The patient had a cutaneous infection with *Brucella abortus*. At first the course was typical, but then a complication arose in the form of a hemorrhagic diathesis on the basis of a thrombopenia and with hemorrhages in the mucous membranes, necroses, generalized purpura, hematuria and cerebellar hemorrhages. No sternal puncture was made while the patient was alive, on account of the danger of hemorrhage. However, the necropsy revealed periostitis, chronic osteomyelitis with fibrosis, nodules of *Brucella abortus* infection in miliary dissemination, hemorrhages and atrophy of the substantia spongiosa. Liver and spleen likewise contained nodules of *Brucella abortus* infection in miliary dissemination. The author thinks that such a characteristic histologic picture is new in *Brucella abortus* infection. Some of the medullary aspects approach those of panmyelopathy. However, further medullary studies will be necessary to gain a better insight into these problems.

Klinische Monatsbl. f. Augenheilkunde, Stuttgart

102: 1-160 (Jan.) 1939. Partial Index

- Megalocornea in Its Connection with Other Deviations in Members of Same Family. R. G. Posthumus.—p. 1.
Trepanation Cyclodialysis. K. Bergler.—p. 49.
Mechanical Injuries of Eye. Ida Czukrász.—p. 57.
Restoration of Lacrimal Passages. Z. Nizetić.—p. 67.
Two-Stage Dacryocystorhinostomy. Z. Nizetić.—p. 71.
*Ocular Tuberculosis and Benign Lymphogranulomatosis (Boeck's Sarcoid, Multiple Benign Miliary Lupoid). F. W. Meyer.—p. 76.

Ocular Tuberculosis and Benign Lymphogranulomatosis (Boeck's Sarcoid).—Meyer shows that the ocular disease which develops in the course of benign lymphogranulomatosis (Schaumann's term for Boeck's sarcoid) or which in some cases exists long before the benign lymphogranulomatosis appears is of tuberculous etiology. The tuberculous character

is indicated by the clinical picture, by the course of the disease and finally by the tendency to the development of secondary phthisis in various organs in the course of benign lymphogranulomatosis. The following aspects are characteristic for the completely developed symptomatology of Schaumann's benign lymphogranulomatosis: peculiar cutaneous efflorescences, osseous changes that are designated as osteitis tuberculosa multiplex cystica (Jüngling), a simultaneous involvement of groups of lymph nodes and peculiar roentgenologic changes in the lungs with enlargement of the mediastinal lymph nodes. In a number of cases ocular disorders develop which exhibit the typical aspects of an ocular tuberculosis. Most likely they represent true tuberculosis of the eye. If the process is completely developed, the tuberculin reaction is usually negative. In the frequent concurrence of benign lymphogranulomatosis and true tuberculosis, the outcome of the tuberculin reaction seems to be determined by the predominance of the one or the other disease. The importance of the roentgenologic aspects of the pulmonary changes is disputed. At any rate, it seems inadvisable to base the diagnosis of benign lymphogranulomatosis only on the roentgenologic changes and perhaps on the negativity of the tuberculin reaction. The outcome of the tuberculin reaction has no corroborative power, since the negative outcome can be observed also in tuberculous processes of other organs and in pulmonary tuberculosis. The peculiarity of the pulmonary aspects does not permit the classification of such cases into a special group, particularly if there exist no changes in other organs. Only microscopic observations permit the definite diagnosis of Schaumann's benign lymphogranulomatosis. Ocular tuberculosis is not an essential aspect of benign lymphogranulomatosis but it frequently accompanies the process; to be sure, it does so not more frequently than does tuberculosis of other organs. Benign lymphogranulomatosis eventually may be an atypical tuberculosis; the term does not indicate the etiology of the peculiar disease.

Klinische Wochenschrift, Berlin

18: 145-184 (Feb. 4) 1939. Partial Index

- Investigations on Metabolism of Vitamin B₁ in Healthy Persons and Patients. H. Schroeder.—p. 148.
 *Permeability of Blood-Cerebrospinal Fluid Barrier for Sulfanilamides. Vonkennel and W. Schmidt.—p. 150.
 Porphyria and Intestinal Saprophytes. A. S. von Mallinckrodt-Haupt.—p. 153.
 4,4'-Dioxy-Alpha-Beta-Diethylstilbene, a Synthetic Compound with Action of Estrogenic Preparations. H. Kreitmair and W. Sieckmann.—p. 156.
 Value of Bacteriologic Examination of Sternal Marrow. H. E. Bock.—p. 162.
 Paroxysmal Tachycardia. H.-J. Kohlbek.—p. 165.
 *Diagnosis of Syphilis by Means of Coagulation Reaction in Cerebrospinal Fluid. E. Carlinfanti.—p. 168.

Permeability for Sulfanilamides of Blood-Cerebrospinal Barrier.—Vonkennel and Schmidt studied the sulfanilamide content of the blood and its passage into the cerebrospinal fluid after oral and parenteral administration. In this paper they give their attention to the permeability of an intact blood-cerebrospinal barrier for sulfanilamides. After the oral or parenteral administration of various sulfanilamides they examined the blood and the cerebrospinal fluid at hourly intervals for a period of five hours. Summarizing their observations, they stress the following points: 1. Soluble prontosil could not be detected in the cerebrospinal fluid. 2. Solution of sodium sulfanilate was found to pass into the cerebrospinal fluid only in the smallest quantities. The salt effect and the hydration capacity are suggested as explanation for this. 3. The para-amino-benzene-sulfonamide (prontosil album) showed an excellent penetration into the cerebrospinal fluid. 4. The dimethyl-disulfanilamide showed practically no permeation capacity, under the conditions employed by the authors. They think that this is due to the slight concentration in the blood and to the molecular volume of the substance. 5. The para-amino-benzene-sulfonacetylamine (albicid) and a carbohydrate compound of sulfanilamide showed the same qualitative behavior as does the pure sulfanilamide.

Coagulation Reaction in Cerebrospinal Fluid in Diagnosis of Syphilis.—Carlinfanti discusses the theoretical foundations and describes the technique of a method which permits the demonstration of syphilitic antibodies and their quantitative examination in small quantities of cerebrospinal fluid and with

the aid of inexpensive reagents. It is a modification of a coagulation reaction which was described in 1914 by Hirschfeld and Klinger. It has been employed on 418 specimens of cerebrospinal fluid and the impression has been gained that in view of its sensitivity and because it differs in nature from other reactions it could render good service as an accompanying test to the Wassermann reaction and to the flocculation reactions.

Münchener medizinische Wochenschrift, Munich

86: 121-160 (Jan. 27) 1939. Partial Index

- Measuring of Dose in Short Wave Therapy. J. Kowarschik.—p. 121.
 *Blood Transfusion in Treatment of Acute Severe Carbon Monoxide Poisoning. K. G. Koch.—p. 126.
 Cyclically Conditioned Pains in Breasts. K. Evelbauer.—p. 128.
 Experiences with Cycloscopy According to Samuels. R. Wenner.—p. 131.
 Fundamentals of Problem of Vitamin Requirements. H. Schroeder.—p. 133.
 Remarks on Bulgarian Cure. M. John.—p. 135.
 Postvaccinal Disturbances. S. Werner.—p. 136.

Blood Transfusion in Carbon Monoxide Poisoning.—Koch states that the chief effect of carbon monoxide poisoning and the factor that threatens the life of the patient is the anoxemia, resulting from the formation of carboxyhemoglobin. After discussing measures that have been recommended to counteract this anoxemia, such as inhalation of oxygen or of oxygen and carbon dioxide and the administration of methylene blue, he points out that hemoglobin, which is introduced by means of blood transfusion, will act at once as an oxygen vehicle. Patients who have the signs of severest intoxication, that is, those in whom the reflexes and reactions have been abolished, in whom respiration and circulation are greatly impaired and who do not respond to strong stimulants, many have such a small amount of oxyhemoglobin that inhalation of oxygen, circulatory stimuli and venesection will not prevent death. The author demonstrates, on the basis of case histories, that in such cases blood transfusion after a previous venesection may save the patient's life, because the large quantity of normal hemoglobin introduced in this manner will provide the lacking oxygen more rapidly than will other methods. It is advisable to precede the transfusion by venesection. This procedure removes carboxyhemoglobin from the circulation because the blood in the depots, which is forced into the circulation following venesection, does not absorb the carbon monoxide as rapidly as does the circulating blood. Moreover, the loss of blood stimulates the emergence of new erythrocytes from the bone marrow. If in severe cases of carbon monoxide poisoning venesection and blood transfusion have provided the organism with sufficient oxygen to avert death, the further treatment with oxygen and circulatory stimulants has better prospects of success. The author describes the clinical histories of two patients with severe carbon monoxide poisoning who probably would not have survived without the repeated blood transfusions.

86: 161-200 (Feb. 3) 1939. Partial Index

- Treatment of Accidental Wounds. F. König.—p. 161.
 Prophylaxis of Tetanus or Not? F. Jaeger.—p. 164.
 *Prognosis of Arborization Block. F. Kienle.—p. 168.
 Danger of Pure Sunstroke, Without Overheating in High Mountains. K. Leonhard.—p. 174.

Prognosis of Arborization Block.—Kienle maintains that the diagnosis of arborization block can be based only on the electrocardiogram. After citing the electrocardiographic characteristics which Weber designates as the basis of the diagnosis of the arborization block, he says that it was generally believed that extensive destruction of or severe damage to the fine terminal fibers of the specific connecting system was the cause of these severe electrocardiographic changes. However, some investigators showed that extensive myocardial changes are the cause of the arborization block and this was proved by the detection of severe organic changes in the myocardium. On the other hand there were investigators who maintained that there is also a "functional" arborization block and it was actually proved that an arborization block was caused by coronary insufficiency and disappeared after treatment with theophylline with ethylene diamine. Here the deficient blood supply had apparently caused "fatigue" but not organic damage in the conduction system. The author further shows that many electrocardiographic curves which have been designated as indicating arbori-

zation block were really branch block curves because the narrowly circumscribed electrocardiographic characteristics of arborization block were not strictly adhered to. The prognostic evaluations based on such records are therefore erroneous. For this reason he investigated the prognosis of arborization block in twenty-five patients who were observed at his clinic and who remained under observation until death. In this material the prognosis of arborization block proved much more unfavorable than was indicated in earlier reports. All of the twenty-five cases terminated in death in the course of one year. The average survival was three and one half months. The mortality curve shows a steep downward trend during the first two months and this is ascribed to the rapid fatal termination of the cases of arborization block, which are caused by infarct. A case is described in which multiple infarcts produced the electrocardiographic aspects of an arborization block, whereas the typical signs of infarct were absent from the electrocardiogram.

Zeitschrift f. d. ges. Neurol. u. Psychiatrie, Berlin
164: 417-580 (Jan. 23) 1939

- Clinical Aspects of Exogenic Psychoses. K. Westphal.—p. 417.
Studies on Vitamin C Content of Cerebrospinal Fluid: Seasonal Fluctuations of Vitamin C Content in Cerebrospinal Fluid of Nursing. M. Kasahara and I. Gammo.—p. 492.
*Question of Spontaneous Remissions of Schizophrenic Psychoses with Special Consideration of Duration of These Remissions: What Can Be Attained with the Shock Therapy of These Conditions? G. Langfeldt.—p. 494.
Investigations on Pavlov's Reflexes in Patients with Mental Defects. M. Schröter.—p. 501.
Contribution to Knowledge of Pyknolepsy. M. Rohde.—p. 516.
Relations Between Changes in Blood Sugar, Clinical Symptoms and Curative Course in Insulin Therapy of Schizophrenic Patients. E. Hoffmann.—p. 531.
Circumscribed Arachnoidal Sarcoma of Cerebellum. O. Foerster and O. Gagel.—p. 565.

Spontaneous Remissions of Schizophrenic Psychoses.—Langfeldt deplors that many investigators of the shock therapy of schizophrenia overlook the fact that their statistical reports are of limited value as long as they fail to state what forms of schizophrenia were treated. He shows that the psychoses which are designated as schizophrenia can be divided into two main groups: (1) the typical schizophrenias, that is those cases which in Kraepelin's terminology are designated as dementia praecox and (2) the so-called schizophrenias, the "schizophreniform psychoses." This second group includes chiefly persons with some manic-depressive aspects and persons with psychopathic tendencies (paranoid, hysterical, asthenic cyclothymic schizoid and others). The typical and the atypical schizophrenias differ greatly in their prognosis. The atypical schizophrenias are nearly all spontaneously cured and, except for a few cases with an intermittent course, the cure is permanent. Shock therapy shortens the duration of these atypical cases. However, it cannot be definitely said as yet whether this is a permanent advantage. Among the schizophreniform conditions that have an acute onset there are also cases that show the typical schizophrenic symptomatology. If these cases are not treated they have an unfavorable prognosis. However, it will require further investigations to determine whether these cases are amenable to shock therapy. The author says that there is an increase in reports which show that the atypical schizophrenias are the ones that react favorably to shock therapy with insulin or metrazol. He emphasizes that all reports on shock therapy of schizophrenia should give attention to the differentiation between typical and atypical cases of schizophrenia.

Vestnik Khirurgii, Leningrad

56: 655-828 (Nov.) 1938. Partial Index

- *Magnesium Sulfate Blood Transfusion in Experimental Shock. B. P. Abramson.—p. 659.
Clinical Observations on Hexenal Anesthesia. T. M. Ayzman and G. Ya. Iosset.—p. 671.
Treatment of Compound Fractures of the Cranial Vault. G. Ya. Iosset.—p. 680.

Magnesium Sulfate Blood Transfusion in Experimental Shock.—Abramson states that 100 blood transfusions performed in his clinic with magnesium sulfate as a preservative demonstrated the usefulness of this method. In order to test its effect in traumatic shock the author performed animal experiments in which profound shock was induced in anesthetized

cats by repeated evisceration and traction on the mesentery. It was found that bleeding the animal one half hour or forty-eight hours before the experiment rendered it more liable to shock. The latter was of such degree that the animals could no longer be saved by intravenous saline transfusion. With the use of magnesium-blood transfusion the author succeeded in saving eight of ten animals. The author concludes that the effect of magnesium sulfate-blood in shock is not inferior to that of citrated or whole blood.

50: 829-932 (Dec.) 1938. Partial Index

- Operation for Sectioning of Splanchnic Nerves in Arterial Hypertension. S. S. Shurimanyan.—p. 831.
*Umbilical Cord as Bone Suture Material. L. G. Shkolnikov.—p. 839.
Significance of Dissecting Aneurysm in Surgery. Ya. A. Bukhshlab.—p. 847.
Organization and Work of Surgical Division in Distant Regions (Periphery). F. G. Uglov.—p. 856.

Umbilical Cord as Bone Suture Material.—Shkolnikov describes a method of preparing human umbilical cord to be used as bone suture material. After the blood is expressed from the cord by pressure and rinsing in water, it is dried, shaped and stretched. The dried cord is kept for one month in a solution containing pure iodine 10 parts, potassium iodide 10, alcohol 1,000 and glycerin 80. The solution is changed twice in the course of the month. The cord thus treated proved sterile after multiple culturing. Its tensile power amounted to from 20 to 80 Kg. The author demonstrated in animal experiments that this suture material is absorbed slowly, that is in from two to six months. Roentgenograms and microscopic sections demonstrated a stimulating effect on the various bony elements, in particular the periosteum. The suture was applied in twelve clinical cases, in four of which there were pseudarthroses, in three compound fractures and in five simple fractures. The suture held the bony fragments satisfactorily. There was no infection. The author concludes that this biologic homoplastic material is well suited for bone suture because of its tensile strength, resistance to infection, slow absorption and osteogenic effect.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

83: 727-866 (Feb. 18) 1939. Partial Index

- Psychoses in Heart Disease. H. C. Rünke.—p. 728.
Examination of Blood and of Blood Pressure During Airplane Trip from Amsterdam to Batavia and Back. C. J. van Mervennée.—p. 736.
*Leptospirosis of Dogs in Antwerp. N. van der Walle.—p. 740.
Intestinal Myiasis Caused by Larvae of Sarcophaga Haemorrhoidalis in Child. L. S. Wildervanck.—p. 756.

Leptospirosis in Dogs.—Van der Walle examined 100 dogs of the municipal enclosure for stray animals at Antwerp for leptospirosis. He was able to demonstrate the presence of antibodies to leptospiras in the blood of forty-four of these animals. The number of cases in which *Leptospira canicola* was more strongly lysed than *Leptospira icterogenes* was about twice as great as the number in which the other reaction was more prominent. The percentage of infection increased with the age of the dogs. On the whole, a larger number of positive reactions was detected in male than in female dogs. *Leptospira canicola* was cultivated from the kidneys of one of the apparently healthy dogs. This leptospira appeared only slightly pathogenic for guinea pigs; jaundice was noticeable only after the second passage. Two young dogs which had been intravenously injected with this culture had only a slight temporary conjunctivitis. One of these animals was killed twenty days after the infection; the Levaditi stain showed numerous leptospiras in the kidneys, but exclusively in the tubules.

Acta Chirurgica Scandinavica, Stockholm

82: 1-98 (Feb. 13) 1939

- Hemophilia with Spontaneous Hemorrhage in Iliopsoas Muscle Followed by Injury to Femoral Nerve: Case. A. Tallroth.—p. 1.
*Posttraumatic Disturbances in Region of Appendix, So-Called Traumatic Appendicitis. S. Grettve.—p. 11.
Neurogenic Factor in Strangulation Ileus. H. Wahren.—p. 57.
*Trauma and Leukemia. T. Olovson.—p. 63.
Surgical Treatment of Split Fractures at Proximal End of Tibia. E. Landelius.—p. 90.

Posttraumatic Disturbances of Appendix.—Grettve asserts that the significance of trauma as an etiologic factor in posttraumatic disturbances of the appendix has been overrated. If a blunt force hits the lower right part of the

abdomen directly and with great violence, it may result in rare cases in real damage to the appendix. Minor injuries probably heal spontaneously, but those of a major kind may be complicated by inflammatory processes necessitating operative intervention. If operation is not unduly postponed, it should be possible to ascertain whether the condition is the direct result of injury. On the other hand, it is questionable whether such cases should be regarded as true appendicitis even if the damaged appendicular wall has been overtaken by necrosis and is the seat of secondary inflammatory processes. No external violence is likely to lead to typical appendicitis in a previously healthy and normally functioning organ. On the other hand the possibility exists, at any rate theoretically, that a direct violence to the appendicular region may become the exciting factor in the production of appendicitis in an organ which is the seat of old pathologic changes and which, as a result of impeded emptying, is already threatened by a spontaneous attack. In practice it is probably never possible to exclude with certainty that the appendix before the accident had been the seat of a quiescent or developing inflammatory process which till then had produced no manifest symptoms. Direct violence to the abdomen farther away from the appendicular region or a sudden reflex contraction of the abdominal muscles as a result of the accident cannot produce either damage to the appendix or appendicitis. In some cases prevailing conditions may justify the assumption that appendicitis had been present at the time of the accident. It seems impossible, however, to appraise the true significance of a trauma in a patient with a previously obscure appendicitis. The appendicitis may have begun at approximately the same time at which the patient sustained the accident. On the other hand the violence may have aggravated the inflammatory process, but it hardly will be possible to state to what extent the duration and final outcome of the disease were influenced by the trauma.

Trauma and Leukemia.—Olovson describes two cases of myeloid leukemia which occurred in connection with traumas. The leukemia developed after fracture in one and after contusion in the other. Reviewing the literature, the author detected sixty-seven similar cases. In forty of the sixty-nine reported cases the trauma consisted in contusion of the abdomen (splenic region), in twenty-one cases other regions were affected; in eight cases the accident had caused fracture of some bone. The possibility of trauma as a cause of leukemia is being discussed in the light of the present day theories as to how leukemia arises. Some causal connection may quite well exist; the trauma may constitute the exciting factor in a person predisposed to leukemia. Yet it would seem that trauma can play only a small part, as traumas occur frequently but traumatic leukemia is a rare condition.

Nordisk Medicin, Helsingfors

1: 1-82 (Jan. 7) 1939

Hospitalstidende

*Histologic Investigations on Pylorus Gland Organ in Pernicious Anemia. E. Meulengracht.—p. 11.

*Early Diagnosis of Pleural Empyema. M. Olesen and U. Hansen.—p. 19.

Pylorus Gland in Pernicious Anemia.—Meulengracht's examination of the stomach and duodenum from eight patients with clinically and anatomically diagnosed pernicious anemia revealed pronounced changes in the fundus, with atrophy of the glands and disappearance of the special glandular elements. The changes were less definite in the pylorus and the pyloric glands seemed to be relatively well preserved. In the Brunner glands no changes could be demonstrated microscopically. The author discusses the possibilities for reconciling these results with the present conception of the pathogenesis of pernicious anemia. He suggests as the most probable explanation, wholly or in part, a failure of the interaction between the intrinsic and extrinsic factors which originate the third principle, or liver factor, a process which must be ascribed to the intestine, especially the small intestine.

Early Diagnosis of Pleural Empyema.—Olesen and Hansen describe a procedure for recognizing an empyema in its earlier phase, while the pleural exudate is still serous or

turbid. The cells from the exudate are stained by Olesen's supravital staining method. Living leukocytes absorb the neutral red in their granules, while dead leukocytes cannot be stained in the weak solution used. In the exudate from seven cases of pleurisy between 22 and 100 per cent of the leukocytes could not be stained, and in these cases an empyema developed in from two to sixty days. In 101 cases in which all the leukocytes were stained, no empyema occurred.

Norsk Magasin for Lægevidenskapen

*Case of Idiopathic Dilatation of Choledochus (or Congenital Choledochus Cyst). P. Bull.—p. 31.

Mass Psychosis and Its Effects. D. Abrahamson.—p. 36.

Blood Type A₂B with Strongly Developed Agglutinin a₁ and Relation of This Type to Blood Transfusion. O. Hartmann.—p. 39.

Variations of Content of Vitamin C in Potato. E. Mathiesen.—p. 42.

Congenital Choledochus Cyst.—Bull states that there are now about 100 known cases of this disorder. Only five cases have been recorded in patients over 41. His patient, a woman aged 42, had abdominal pain, probably due to the biliary disturbance, during childhood and a symptom free period between the ages of 18 and 31 and transient jaundice two years later. On gastrojejunostomy for a callous pyloric ulcer when the patient was 35 no tumor was discovered. Seven years later there was pain in the epigastrium radiating to the spine, with dyspnea; a round, tender, fluctuating tumor, thought to be a retroperitoneal cyst originating from the pancreas, filled the epigastrium. After puncture and removal of 2,250 cc. of thick dark fluid idiopathic dilatation of the common bile duct was diagnosed. Cholecystoduodenostomy was done. Grave infection in the cyst followed and 3,000 cc. of fetid fluid was removed on repuncture; hemorrhagic nephritis and hypochloremic uremia developed. Recurring retention necessitated a third puncture and drainage, with removal of 1,500 cc. of fetid pus. Steady improvement set in and on discharge no tumor was palpable. The author says that idiopathic dilatation of the common bile duct predominates in women. The cardinal symptoms are pain, tumor and jaundice. Grave complications may occur; the contents of the cyst may become infected before or after anastomosis between the cyst and the intestine, there may be a marked hemorrhagic diathesis, and in rare cases the cyst may rupture into the abdomen. Correct diagnosis before operation is said to have been made in only five or six cases. The prognosis depends first of all on the patient's condition at the start of surgical treatment. The mortality for the known cases is about 60 per cent. All authors agree that a communication must be established between the bile duct and stomach or intestine, whether primarily or after preliminary drainage; secondary anastomosis must not be long delayed.

Medicinsk Revue

Duodenal Diverticula. S. Quist-Hanssen.—p. 45.

*Phlegmonous Gastritis. K. Schnitler.—p. 51.

Phlegmonous Gastritis.—Schnitler says that in two of his cases of phlegmonous gastritis the onset was acute and death occurred within four days, while in another, with pain in the epigastrium for several days before admission, the course was more protracted. In the latter, certain reparative changes appeared microscopically in the form of a fairly active formation of connective tissue and fibroblasts. The infection was due to streptococci, either in pure culture or together with staphylococci. In the one case there was a chronic gastritis from misuse of alcohol and a lesion from a bone splinter which had penetrated into the gastric submucosa. In the others, erosions and ulcerations in the gastric mucous membrane are regarded as the port of entry. In phlegmonous gastritis an acute inflammation is present in the submucosa, partly with the picture of a diffuse phlegmon, partly more localized abscesses, or both. The inflammation may progress and occupy practically the whole stomach or be more limited. In the localized cases the seat of the process is usually the pylorus or its immediate vicinity. Diagnosis is not generally made until operation or necropsy. Prognosis is grave. Treatment of the acute cases is surgical. In the localized cases recovery has followed resection of the stomach. In the diffuse form treatment can be only palliative.

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NICOTINIC ACID IN THE TREATMENT OF ATYPICAL PSYCHOTIC STATES

ASSOCIATED WITH MALNUTRITION

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There have been reports of excellent results from the treatment of pellagrous psychoses with nicotinic acid;¹ these have dealt with the more familiar mental symptoms occurring in frank or subclinical pellagra of the usual type. The present communication deals with observations made on nineteen individuals all presenting mental symptoms of somewhat similar pattern, none corresponding to the ordinary conception of pellagrous dementia. Hebetude grading into profound stupor was a feature so prominent that frontal lobe tumor was suspected in three patients, lethargic encephalitis in one and chronic subdural hematoma in a third. Delirium was present three times, agitated depression once, and one patient presented the signs of central neuritis. Signs of peripheral neuritis were not discovered, but five patients had marked deafness which disappeared under treatment; it was difficult to determine whether this transient deafness was due to failure of attention or to actual interference with the auditory mechanism.

The complete syndrome of pellagra was absent and no patient had a history of the disease. Glossitis, in the sense of abnormal redness of the tongue, with or without papillary atrophy and ulceration, was present in all but two of the group. Stomatitis occurred only once, dermatitis was not seen, two patients had mild nonspecific vaginitis and one had diarrhea which developed while under observation. The incidence of gastric anacidity was quite irregular; in many instances gastric contents could not be secured. Inadequate nutrition was evident from the history or the observations made in every case. There was no attempt at rigid control of the diet, feeding was a problem always, and the poor condition of the patients often made the use of a pellagra-producing diet unjustifiable. A few profoundly unconscious patients were of necessity maintained on parenterally administered dextrose and

sodium chloride solutions during a part of the treatment period.

All patients were subjected to rather comprehensive clinical and laboratory examination, including a neurologic and psychiatric survey. All usual quantitative, chemical and serologic determinations were made on the blood and cerebrospinal fluid. Electrocardiograms were made soon after admission and often repeated. The excretion of ascorbic acid in the urine was followed in a number of instances.

A great majority of the group were elderly and had organic disease, which might have been considered an adequate cause for the mental symptoms. At least eleven had advanced arteriosclerosis complicated in one instance by cerebrospinal syphilis; one patient had clinical and serologic evidence of cerebrospinal syphilis without peripheral vascular disease, and two men were severely and chronically alcoholic. A control group presenting stupor of demonstrable organic origin was made up of patients with frank cerebral vascular accidents, brain tumor and bromide intoxication.

The use of nicotinic acid was at first quite empirical, the coincidence of stupor and glossitis in obviously malnourished patients suggesting the possibility of incomplete or "cerebral" pellagra as a contributing factor to their dilapidation. Usual methods for hydration and support were taken in every case. Three patients (1, 3 and 4) were given thiamin chloride intramuscularly and intrathecally and one patient (17) took adequate amounts of this vitamin by mouth. Nicotinic acid was administered after other forms of treatment failed to produce improvement; except in case 17 it was given intravenously as sodium nicotinate. Sodium nicotinate was prepared by neutralizing a saturated solution of nicotinic acid with sodium bicarbonate, phenolsulfonphthalein being used as the indicator; the solution was then diluted to a standard volume representing 0.5 mg. of nicotinic acid per cubic centimeter, sterilized in pyrex flasks and stored in a refrigerator until used. Dosage varied from 100 to 300 mg. daily, the treatment period from three to ten days. The usual peripheral vasodilatation occurred during injection of the solution, but no untoward reactions were observed.

Response to nicotinic acid was striking in the group under discussion. In four cases (3, 8, 12 and 15) the vitamin seemed to contribute greatly to improvement; in the rest, "cure" was dramatic. In the control group with demonstrable cause for stupor, no improvement was noted after administration of equal or larger amounts. The results of treatment made it evident that these patients presented a form of pellagra evidently common but seldom recognized, even in endemic areas where physicians are alert to the rather protean manifestations of the disease. We are quite certain

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1. Matthews, R. S.: Pellagra and Nicotinic Acid, *J. A. M. A.* **111**: 1148 (Sept. 24) 1938. Spies, T. D.; Aring, C. D.; Gelperin, Julius, and Bean, W. B.: The Mental Symptoms of Pellagra, *Am. J. M. Sc.* **196**: 461 (Oct.) 1938. Sydenstricker, V. P.; Schmidt, H. L., Jr.; Fulton, M. C.; New, J. S., and Geeslin, L. E.: The Treatment of Pellagra with Nicotinic Acid, *South. M. J.* **31**: 1155 (Nov.) 1938. Spies, T. D.; Grant, J. M.; Stone, R. E., and McLester, J. B.: Recent Observations on the Treatment of 600 Pellagrins with Special Emphasis on the Use of Nicotinic Acid in Prophylaxis, *ibid.* **31**: 1231 (Dec.) 1938.

that the therapeutic test with nicotinic acid was life saving in practically all of the group and equally certain that many persons have been allowed to die because of a failure to recognize the cerebral symptoms of pellagra when other evidences of the disease are absent. Jolliffe² has recently reported a somewhat similar experience in patients with signs of central neuritis. We are fully in accord with his suggestion that cerebral manifestations may be the first evidence of severe or complete depletion of nicotinic acid.

While each patient in this series presented phenomena of unusual interest and possible importance, for the

Summary of Cases

No. and Name	Race, Sex, Age	Signs	Associated Diseases	Nicotinic Acid	Result*
1 H. J.	W, ♂, 27	Stupor, glossitis	Alcoholism	100 mg. daily 9/10-9/21, 1938	Well
2 G. M.	W, ♂, 49	Stupor, glossitis	Alcoholism, arteriosclerosis	100 mg. daily 9/26-9/28, 1938	Well
3 M. B.	W, ♀, 42	Stupor, glossitis?	Hysteria	100 mg. daily 9/13-9/22, 1938	Improved (stupor well)
4 A. M.	W, ♀, 57	Stupor, glossitis	Severe macrocytic anemia	100 mg. daily 9/30-10/3, 1938	Well
5 L. J.	W, ♂, 78	Stupor, glossitis†	Arteriosclerosis	100 mg. daily 10/11-10/16, 1938	Well
6 L. W.	C, ♀, 62	Stupor, glossitis	Arteriosclerosis, severe	100 mg. daily 10/9-10/12, 1938	Well
7 H. H.	W, ♂, 54	Stupor, glossitis	Arteriosclerosis, severe	100 mg. daily 10/19-10/26, 1938	Well
8 B. S.	W, ♂, 56	Stupor, glossitis	Arteriosclerosis	125 mg. daily 10/22-10/27, 1938	Improved
9 D. W.	W, ♀, 54	Stupor, glossitis	Arteriosclerosis, syphilis	150 mg. daily 10/17-10/21, 1938	Well
10 M. T.	C, ♀, 24	Stupor, glossitis	.....	100 mg. daily 11/2-11/4, 1938	Well
11 B. R.	W, ♀, 48	Stupor, glossitis,† vaginitis	.....	150 mg. daily 11/4-11/8, 100 mg. 11/9-11/11, 1938	Well
12 S. B.	W, ♀, 54	Stupor, glossitis	Involuntional psychosis	150 mg. daily 11/5-11/8, 1938	Improved
13 C. J.	W, ♀, 56	Stupor, glossitis	Abscess of thigh	150 mg. 11/25, 300 mg. 11/26, 150 mg. 11/27, 1938	Well
14 M. L.	C, ♂, 48	Lethargy	Arteriosclerosis, syphilis	200 mg. daily 11/19-11/22, 1938	Well
15 S. H.	W, ♀, 75	Stupor, glossitis	Arteriosclerosis	100 mg. daily 1/2-1/9, 1939	Improved
16 D. B.	W, ♀, 38	Stupor, glossitis†	Syphilis	300 mg. daily 1/4-1/6, 1939	Well
17 R. W.	W, ♂, 78	Stupor, glossitis	Arteriosclerosis, cancer	200 mg. daily by mouth, 12/26, 1938-1/4, 1939	Well
18 V. R.	W, ♂, 58	Stupor	Arteriosclerosis	300 mg. daily 1/13-1/15, 1939	Well
19 J. D.	W, ♂, 54	Stupor, glossitis†	Arteriosclerosis, syphilis	300 mg. daily 1/14-1/17, 1939	Well

* "Well" indicates that stupor and glossitis were entirely cured, not that associated chronic diseases were influenced. "Improved" indicates that stupor and glossitis were cured but organic or functional mental changes of nonpellagrous origin persisted.

† Typical pellagrous glossitis.

sake of brevity the important observations are tabulated and summaries of only six typical case histories presented.

CASE HISTORIES

CASE 1.—H. J., a white man aged 27, was admitted to the University Hospital Aug. 27, 1938, from the city jail, where he had been taken in an alcoholic stupor. There was a history of severe chronic alcoholism. On admission the patient was well developed and well nourished, stuporous and with no evidence of paralysis. Ophthalmoscopic examination showed normal fundi. The tongue was red, dry and rough. General physical examination was not significant. Neurologic examination showed absence of knee and ankle jerks and no abnormal reflexes were present; there was definite response to painful

stimuli. All routine laboratory examinations were of no significance. The cerebrospinal fluid was under 90 mm. of water pressure, the Queckenstedt test was negative, the cell count and protein content were normal and reactions with colloidal gold and mastic suspensions were negative. Intubation was done and a liquid high vitamin diet was instituted. Thiamin chloride was given intrathecally, 20 mg. August 27, August 31 and September 4. The usual treatment for cerebral edema was carried out but no improvement resulted. For fourteen days the man lay in deep stupor; September 10, nicotinic acid was given, 100 mg. intravenously as sodium nicotinate; during the afternoon some four hours after treatment the man regained consciousness and spoke rationally. Treatment was continued for ten days; on the second day solid food was requested and on the fourth the patient was up and walked about the ward. Neurologic examination on the day when consciousness returned showed no evidence of peripheral neuritis. September 12 the fasting contents of the stomach showed 38 degrees of free hydrochloric acid and 47 degrees of total acidity. The man was discharged well September 26.

CASE 4.—A. M., a white woman aged 57, was admitted to the University Hospital Sept. 20, 1938. A history obtained from the relatives told of progressive difficulty in walking and almost constant headache for the past two years; during the past three weeks the patient had become almost completely ataxic and entirely lethargic. She was well nourished and well developed, apparently stuporous but could be aroused by drastic stimulation. The temperature was 98, the pulse 88, the respiratory rate 22 and the blood pressure 120 systolic, 80 diastolic. The skin was dry, a lemon yellow and free from blemishes. The tongue was liver colored with complete atrophy of the papillae. There were systolic murmurs at the mitral and aortic areas of the moderately enlarged heart. The peripheral arteries were large, firm and tortuous. The liver and spleen were not felt. The uterus and adnexa were senile. Neurologic examination after some difficulty showed a broad-based gait with staggering while supported. Romberg's sign was present and the finger to finger and heel to shin tests showed marked ataxia. Knee jerks were hyperactive but no abnormal reflexes were present. The pupils were irregular and responded quite sluggishly to light. After mydriasis, only pallor of the retina and retinal arteriosclerosis were evident. On psychiatric examination the patient was stuporous and entirely unable to cooperate. The blood contained 11 Gm. of hemoglobin per hundred cubic centimeters, 2,500,000 red blood cells and 7,800 white blood cells per cubic millimeter, with 160,000 platelets per cubic millimeter and 0.5 per cent reticulocytes. The color index was 1.2, the volume index, 1.2. The gastric contents after histamine September 22 showed 0 free hydrochloric acid and 12 degrees of total acidity. The cerebrospinal fluid was normal. The urine and stools contained an excess of urobilin. Blood smears showed anisocytosis, poikilocytosis and macrocytosis. Nucleated erythrocytes were not seen, platelets were abundant and no abnormal leukocytes were noted.

The diagnosis of Addisonian anemia was made and concentrated liver extract-Lilly was given, 15 cc. intramuscularly as a depot dose September 23, following by 3 cc. daily for five days. Thiamin chloride 10 mg. was given intrathecally September 22 and 10 mg. intramuscularly was administered from September 23 to October 3; 400 cc. of blood was transfused September 24. No reticulocyte response followed the use of liver extract; daily counts varied between 0.3 and 0.6 per cent, nor was there any clinical improvement.

September 30 nicotinic acid (as sodium nicotinate) 100 mg. was given intravenously and continued until October 4. On October 1 the patient was conscious and cooperative and ate ravenously of the regular ward diet. On the following day she was alert and entirely rational. October 5, oral administration of nicotinic acid was substituted for intravenous treatment and 300 mg. was given each day in doses of 50 mg. every two hours from 8 a. m. to 6 p. m. Ferrous gluconate was prescribed, 5 grains (0.32 Gm.) three times a day. Clinical improvement was rapid. October 14 the patient was able to be up and around the ward. By October 18 all neurologic signs had disappeared; the patient was rational and

2. Jolliffe, N. H.: Effects of Vitamins on Mental and Emotional Processes, read before the Association for Research in Nervous and Mental Diseases, New York, Dec. 27, 1938.

in good spirits. The blood contained 12.5 Gm. of hemoglobin per hundred cubic centimeters, 4,200,000 red blood cells and 9,500 white blood cells per cubic millimeter. Volume and color indexes were 1. No reticulocytosis was observed; the maximum count was 0.8 per cent. The patient was discharged October 19 apparently well.

CASE 5.—L. J., a white man aged 78, was admitted to the University Hospital Sept. 30, 1938. A history obtained from the relatives told of increasing weakness and lethargy over a period of several weeks; eight days before admission the patient became bedfast and stuporous. He was fairly well nourished, stuporous and mildly delirious. The temperature was 99.2 F., the pulse 80, the respiratory rate 20 and the blood pressure 186 systolic, 110 diastolic. The skin was dry and wrinkled, the retinal arteries were sclerotic and the tongue was dry, bright red and atrophic. There was evidence of pulmonary congestion; the heart was moderately enlarged. There was advanced peripheral arteriosclerosis. Laboratory examinations showed moderate hypochromic anemia, normal renal function and electrocardiographic evidence of coronary sclerosis. The gastric contents could not be obtained. A liquid high vitamin diet, concentrated solutions of dextrose given intravenously and full doses of digitalis had no effect on the patient's condition. October 11 nicotinic acid was given, 100 mg. intravenously as sodium nicotinate, and repeated daily until October 16. On the second day of treatment the patient was alert and attentive and the tongue was pink and showed many small papillae. By October 14 the sensorium was entirely clear and the tongue normal. The patient was dismissed well October 19 and remained apparently well until Jan. 20, 1939, when he died suddenly from massive cerebral hemorrhage.

CASE 10.—M. T., a Negro woman aged 24, admitted to the University Hospital Oct. 27, 1938, had been seen many times in the outpatient department during the previous eight months complaining of headache and general malaise. In March 1938 she showed marked lethargy and March 31 a lumbar puncture yielded normal cerebrospinal fluid. During October consciousness became so clouded that she could not keep her eyes open or answer questions during an interview. There were no signs of an active psychosis.

On admission she was well developed and fairly well nourished, uncooperative and apparently stuporous. The temperature was 99 F., the pulse 80, the respiratory rate 18 and the blood pressure 132 systolic, 96 diastolic. The skin was normal. The left pupil was slightly larger than the right; both reacted normally to light and in accommodation. Ophthalmoscopic examination showed normal fundi. The tongue was red with smooth tip and edges; there was no stomatitis. No abnormalities were discovered on examination of the thorax, abdomen and genitalia. The knee and ankle jerks seemed slightly increased on the right. The patient lay with her eyes closed, entirely inert; she could be roused but consciousness was much clouded and she did not ever speak spontaneously. On being persistently roused she seemed oriented but failed to answer questions adequately, and it was impossible to hold her attention. Delusions and hallucinations seemed to be absent. The blood showed moderate hypochromic anemia; chemical determinations of the blood were negative and the Wassermann and Kahn reactions were negative. The urine showed nothing unusual. The gastric contents after administration of histamine contained 0 free hydrochloric acid and 14 degrees of total acidity. The cerebrospinal fluid was again normal in all respects. An electrocardiogram showed evidence of slight myocardial damage.

Because of persistent hebeticity, frontal lobe tumor was strongly suspected; the possibility of chronic subdural hematoma was also considered. No nutritional history was obtainable but it was decided to try the effect of nicotinic acid, since there was mild glossitis and achlorhydria. Nicotinic acid 100 mg. was given intravenously as sodium nicotinate November 2, 3 and 4. About five hours after administration of the first dose there was a very definite change; the patient was fairly alert and answered questions quite satisfactorily. The following day she was more normal than she had been since she came under

observation, responding promptly and rationally and showing keen interest in her surroundings. She remained clear mentally throughout the remainder of her stay in the hospital, talking freely, observant of all details and showing active and appropriate affective reactions. An encephalogram November 6 showed slight atrophy of both frontal lobes. The gastric contents obtained after administration of histamine November 10 contained 18 degrees of free hydrochloric acid and 35 degrees of total acidity. She was dismissed, apparently well, November 14.

CASE 11.—B. R., a white woman aged 46, was admitted to the University Hospital Nov. 2, 1938, with a tentative diagnosis of carcinoma of the uterus. There was a history of a foul vaginal discharge for some months, with progressive loss of appetite. During ten days preceding admission she had become progressively more weak and irrational, then stuporous and incontinent. She was small, emaciated, immobile and unconscious. The temperature was 100.2 F., the pulse rate 82, the respiratory rate 22 and the blood pressure 100 systolic, 30 diastolic. The skin was loose and dry; there was no dermatitis. The pupils were large and equal and they reacted to light; ophthalmoscopic examination showed normal fundi. The patient was edentulous, the tongue was red and smooth and there was no stomatitis. The lungs, heart and abdomen seemed normal. There was mild vaginitis with a profuse purulent discharge; the uterus and adnexa were normal. All tendon reflexes were much exaggerated with sustained ankle and patellar clonus and Chaddock's sign. The rectal and vesical sphincters were incontinent. There was no response to questions; strong painful stimuli were evidently felt but failed to rouse the patient. There were frequent sucking movements of the lips and cheeks and from time to time spontaneous grasping movements of the hands. There was slight hypochromic anemia; chemical and serologic examinations of the blood were negative. The urine showed moderate amounts of acetone. The gastric contents after administration of histamine contained 0 free hydrochloric acid and 14 degrees of total acidity. The cerebrospinal fluid was normal in all respects. X-ray examination of the thorax and of the gastrointestinal tract was negative.

An indwelling tube was installed for the administration of fluids and liquid diet. Psychiatric and neurosurgical consultants suggested central neuritis and frontal or hypothalamic tumor as possible explanations of the patient's condition. Because of mild glossitis and vaginitis with stupor, it was decided to give nicotinic acid. Amounts of sodium nicotinate solution equivalent to 150 mg. of nicotinic acid were given intravenously November 4 to 8 and then reduced to amounts representing 100 mg. until November 12. Some six hours after the first dose of sodium nicotinate the patient was definitely more responsive and the sensorium, while still clouded, was remarkably clearer. On the second day of treatment the patient was fairly cooperative, noticed the examiner, protruded the tongue on request and answered questions; on this day the indwelling tube was removed and a soft diet was taken. Sucking and grasping movements were less frequent and spasticity was less marked. On the following day she was alert and answered questions rationally. The sphincters were under control and primitive motor phenomena had ceased; all reflexes were normal. On this day the tongue was normal and there was no vaginal discharge. Subsequent improvement was rapid and the patient was dismissed, apparently normal, November 23.

CASE 18.—V. R., a white man aged 58, was admitted to the University Hospital Jan. 13, 1939. There was a history of gradually developing weakness and of aching of the feet with stumbling at night; a sensation of thoracic compression and increasing drowsiness had been present for about four months. He was emaciated, inert and entirely inattentive and looked much older than his stated age. The temperature was 98.6 F., the pulse 90, the respiratory rate 18 and the blood pressure 140 systolic, 80 diastolic. The skin was loose and dry and free from eruption. The pupils were irregular and reacted sluggishly to light and in accommodation. The optic disks were abnormally well defined and gray; the retinal arteries were tortuous and irregular. The tongue was rough and coated, with moderately red tip and edges. The lungs and heart were

not remarkable. The abdomen was scaphoid and the walls were soft. Reflexes were sluggish but no abnormal reflexes were found. There was great difficulty in holding the patient's attention when he was roused; the speech was slurred and there was marked apparent impairment of hearing. No sensory disturbances were found; the gait was slightly ataxic. The blood was normal in all respects, as was the urine. The cerebrospinal fluid showed no abnormalities.

Because the patient was lethargic and evidently poorly nourished it was decided to try the effect of nicotinic acid, though none of the usual signs of pellagra were present; 150 mg. was given intravenously on the evening of January 13 and 300 mg. January 14 and 15. On the morning of January 14 the patient was alert and cooperative, attention was readily gained and held and hearing seemed greatly improved. By the following day all mental clouding had disappeared, as had the speech defect and slight incoordination of the legs. He stated that he felt entirely well, and he was dismissed January 16 with no persisting symptoms.

COMMENT

The results obtained with nicotinic acid in this group of patients would seem to leave no doubt that the stupor, which was the presenting sign in every case, was due to specific deficiency of vitamin. No improvement followed the administration of nicotinic acid to patients with bromide intoxication, brain tumor or recent cerebral hemorrhage or thrombosis. It is to be emphasized that stupor was the single phenomenon common to the group. Glossitis was typical of pellagra in not more than four instances; two patients had rough coated tongues and the other thirteen had tongues which were dry and abnormally red but with abundant papillae, a type commonly referred to as "toxic" or "dehydrated." Gastrointestinal symptoms were absent and no patient showed dermatitis of any sort. The high proportion of elderly patients with advanced arteriosclerosis is significant in that such persons are apt to be without means of livelihood and severely undernourished as a result of neglect by relatives or of their own indifference. In our experience such patients have fallen into a high mortality group usually inadequately diagnosed "cerebral arteriosclerosis" or "cerebromalacia," hospitalized as a gesture and perfunctorily treated until death from bronchopneumonia. It is not to be supposed that we suggest that all stuporous conditions of obscure etiology are manifestations of pellagra. We have, however, been impressed by the dramatic improvement obtained in this series of cases and we are convinced that a therapeutic test with nicotinic acid is justifiable in cases of unexplained hebétude or unconsciousness.

Apparent deafness was a striking feature of five of our cases (2, 13, 14, 18 and 19). It was very difficult to evaluate the improvement in hearing which followed treatment with nicotinic acid. Unquestionably the threshold of auditory perception was raised during the period of stupor, but in two cases (13 and 14) there was a progressive increase in auditory acuity after hebétude had disappeared.

SUMMARY AND CONCLUSIONS

Nineteen stuporous patients showed remarkable improvement after treatment with nicotinic acid.

The usual criteria for the clinical diagnosis of pellagra were largely absent; four patients had the pellagrous type of glossitis and two had vaginitis; dermatitis and diarrhea were not present on admission in any case.

A great majority of the group were elderly with advanced arteriosclerosis and presented a clinical pic-

ture commonly attributed to arteriosclerotic encephalopathy.

Hebétude grading into profound stupor may be the only sign of severe acute pellagra, and therapeutic trial of nicotinic acid is justifiable as the only method at present available for the accurate diagnosis of such cases.

It is our present conviction that nicotinic acid was life saving in all but one or two of the cases under discussion.

BORDERLINE STATES OF NUTRITIVE FAILURE

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Nutrition now occupies the center of the stage. Formerly she played only a minor, somewhat unattractive, role and her lines were few, but today she enjoys a leading part and has the spotlight. Still greater brilliance of performance is promised. This advancement began about a quarter of a century ago when man's imagination was fired and his zeal for scientific inquiry kindled by the discovery that certain hitherto unknown substances, later called vitamins, although required only in minute amounts, are absolutely essential to the orderly progress of an animal's life processes. Without these substances the young fail to grow and the older animal sickens. It is of this sickness, in its many forms, that I wish to speak.

Three facts concerning nutritive failure are becoming increasingly obvious: first, that it does not come solely from lack of vitamins but from deficiency of proteins and minerals as well; in certain of the lower animals it comes even from lack of fats; second, that in America it is seldom complete; and third, that it is not, as a rule, the expression of a single nutritive fault. More often it is partial in extent and multiple in nature with a clinical picture that is correspondingly lacking in detail and hazy in outline.

Important too is the growing realization that nutritional failure is not the result solely of failure of supply, for it is frequently encountered in persons whose food supply is fully adequate. True, many of these patients simply do not eat the food offered them but there are others who, even though they consume adequate food of the right kind, suffer nonetheless from nutritive failure. Theirs is not a problem of the choice of food but of its digestion, absorption and utilization.

The first problem of this character was solved when Castle demonstrated that one of the most common of deficiency diseases, pernicious anemia, is due to a defect of the stomach. Then came reports telling of syndromes of similar character resulting from carcinoma of the stomach, gastrectomy, intestinal anastomosis and partial intestinal obstruction. Even rapid emptying of the stomach or long continued diarrhea may so interfere with digestion and absorption as to lead to nutritive failure. Witness the macrocytic anemia of sprue, due directly in all probability to poor absorption of the extrinsic factor of Castle and more remotely to the alterations in muscle tone and mucosal pattern characteristic of this disease.¹ Even nutritive deficiency

¹The DaCosta Foundation Oration, read before the Philadelphia County Medical Society, Philadelphia, March 15, 1939.
J. Mackie, T. T.; Miller, D. K., and Rhoads, C. P.: Sprue: Roentgenologic Changes in the Small Intestine, *Am. J. Trop. Med.* 15: 571-589 (Sept.) 1935.

itself, as Miller and Rhoads² have shown for the vitamin B complex, may so impair the integrity of the alimentary tract as to interfere with the absorption of other essential substances and thus lead to additional deficiencies of still other types. The same is true of peptic ulcer and chronic ulcerative colitis, which are sometimes attributed to nutritive failure but which are themselves, in all probability, the cause of the deficiencies noted. Apparently anything which seriously impairs the integrity of the gastrointestinal tract may so interfere with digestion and absorption as to lead to nutritive failure.

Such interference, however, is not limited to structural anomalies. Like difficulties are created by abnormalities of the digestive fluids, as can be seen most often in the deficiency states associated with achlorhydria. Just what role this defect plays it is difficult to say, but it is apparently of significance in a number of disorders other than pernicious anemia, notably pellagra and sprue. Even in the hypochromic anemias it plays a part, for in the absence of free hydrochloric acid from the stomach contents iron is not converted from the ferric to the ferrous state and therefore is not readily available for use. Similar hindrances are imposed by the absence of bile from the intestinal tract, for in this condition carotene, the precursor of vitamin A, and perhaps vitamin D also, fail of absorption and there results a deficiency of these elements.

Still other factors are capable of causing deficiency diseases in the face of an adequate food supply. Vitamin A and iron, for example, are both poorly utilized in the presence of an infection. In the case of the latter this was well illustrated by Whipple³ when he told of the dog which ceased to build hemoglobin properly from injected iron when a focus of infection developed but which, as soon as the focus was removed, again produced hemoglobin in expected amounts. Additional evidence of this character is seen in the report of Kellogg and Mettier⁴ that iron is poorly utilized when, as in peptic ulcer, alkalis are given.

Another potent cause of nutritive deficiency, hitherto unrecognized, is the ease with which the balance between vitamin requirement and energy output is upset, for the former is as a rule dependent on the latter, profoundly so in the case of vitamin B₁. If, for example, as was pointed out by Cowgill⁵ and more recently emphasized by Williams and Spies,⁶ a person consumes increased quantities of carbohydrate or alcohol; if, because of hyperthyroidism, fever or additional exercise, he increases appreciably his metabolism or, in the case of a woman, if she becomes pregnant, the requirement for vitamin B₁ is greatly increased. If the diet in this respect has hitherto been a borderline one, nutritive deficiency results and characteristic symptoms may develop.

Similar results may follow disturbances of intermediary metabolism, notably those which accompany disorders of the liver. Many substances are stored in the liver and when it is diseased the body may be

deprived of reserves of essential nutritive elements on which it is accustomed to rely. If this organ is cirrhotic, for example, not only is the storage of vitamin A interfered with but the conversion of carotene into the vitamin is retarded. In addition, poor utilization of vitamin D⁷ and inadequate production of plasma proteins are also experienced. The low levels of ascorbic (cevitamic) acid reported in the blood during rheumatoid arthritis and the assumed increase in requirement are also apparently due to disturbance of intermediary metabolism. It can safely be said, therefore, that the requirement of the body for vitamins and other nutritive essentials is governed by many factors, prominent among which are the condition of the gastrointestinal tract and the functional integrity of the liver.

No discussion of diet today would be complete without some mention of the distinction which is becoming increasingly obvious between minimum and optimum. As applied to nutrition the two words are by no means synonymous. Witness the report of Sherman and Ellis⁸ concerning vitamin G and of Batchelder⁹ concerning vitamin A showing in each group of experiments that the animal's improvement in vigor and nutritive well-being paralleled closely successive additions of the vitamin to the diet until an amount of this substance was administered which was several times that necessary to prevent evidences of nutritive deficiency. Like experience in the feeding of vitamin B to children was reported by Knott.¹⁰ Since the body is apparently unable to build adequate reserves of this vitamin, she assumed that the highest retention represented the optimum intake and found that this point was reached only when six or seven times the minimum requirement was given. Such studies lead to the conclusion not only that optimum in this relationship is distinct from minimum but that it is to be distinguished even from adequate.

Subclinical states of nutritive failure hold greater interest for the average physician than do the outspoken deficiency diseases, both because they are more frequent and because without creating recognizable illness they often destroy the patient's efficiency, impair his sense of well-being and constitute a potent source of poor health. The recognition of these states, however, is not easy because there is no yardstick by which nutritive status can accurately be measured. The effort is being made to perfect methods of precision which will serve this purpose, but except for the determination of the ascorbic acid of the blood and possibly the capacity of the eye for dark adaptation, none of these are suitable yet for general use. The physician must rely on painstaking clinical observation and a recognition of those conditions under which nutritive deficiency is most apt to occur. The symptoms, which are well represented in a group of patients of whom I shall speak presently, are as a rule rather vague and elusive. Significant symptoms always are sore tongue and tendency toward diarrhea, but when these appear the disease can hardly be classed as subclinical. Careful questioning will often reveal faulty dietary habits,

2. Miller, D. K., and Rhoads, C. P.: The Experimental Production of Loss of Hematopoietic Elements of the Gastric Secretion and of the Liver in Swine with Achlorhydria and Anemia, *J. Clin. Investigation* **14**: 153-172 (March) 1935.

3. Whipple: Personal communication to the author.

4. Kellogg, Frederick, and Mettier, S. R.: Effect of Alkaline Therapy for Peptic Ulcer on Utilization of Dietary Iron in the Regeneration of Hemoglobin, *Arch. Int. Med.* **58**: 278 (Aug.) 1936.

5. Cowgill, G. R.: The Physiology of Vitamin B₁, *J. A. M. A.* **110**: 805-812 (March 12) 1935.

6. Williams, R. R., and Spies, T. D.: Vitamin B₁ and Its Use in Medicine, New York, Macmillan Company, 1938.

7. Heymann, Walter: Importance of the Liver for the Antirachitic Efficacy of Vitamin D, *Proc. Soc. Exper. Biol. & Med.* **36**: 812-814 (June) 1937.

8. Sherman, H. C., and Ellis, L. N.: Necessary Versus Optimal Intake of Vitamin G, *J. Biol. Chem.* **104**: 91 (Jan.) 1934.

9. Batchelder, E. L.: Nutritional Significance of Vitamin A Throughout the Life Cycle, *Am. J. Physiol.* **109**: 430 (Sept.) 1934.

10. Knott, Elizabeth M.: A Quantitative Study of the Utilization and Retention of Vitamin B by Young Children, *J. Nutrition* **12**: 597 (Dec.) 1936.

extreme faddism, substandard conditions of living, a long continued illness or operation perhaps, or some other circumstance which has influenced the state of the patient's nutrition. Recognition is often made more difficult by the multiple nature of the deficiency. Even such a clearcut disease as pernicious anemia is frequently complicated by contributory deficiencies. As was well expressed by Minot,¹¹ it is often of more practical importance to recognize that the patient has nutritional deficiency than to be able to name exactly what nutritional deficiencies he has.

The physician who attempts to describe nutritional failure should confine himself to the disorders seen within his own area of activity, for climate, soil, food supply, racial customs, economic considerations, are all of profound influence. I can speak, therefore, only of my own observations in the Gulf states, but these, I believe, will permit of a fair amount of generalization. My interest in nutrition was aroused many years ago by experience with a group of patients who are ordinarily shunned by most physicians. These patients, while presenting a great variety of symptoms, have in common easy fatigue, both mental and physical, anemia of varying degree, digestive disorders of every type and of all grades of severity, aches and pains that are not necessarily constant in time or location, a lowered basal metabolic rate perhaps, dryness and other minor disturbances of the skin, and an emotional instability that physicians are accustomed to associate with neurasthenia. But neurasthenia is a poor diagnosis always, and for this group in particular it is a highly unsatisfactory one. It seemed best at that time to make no diagnosis, and for a number of years with a large measure of success these patients were treated without a diagnosis.

Today, after watching the response of the patient of this type to a more liberal diet, I now feel convinced that his troubles are due largely to nutritive deficiency. The vague pains of which he so often complains are not the expression merely of heightened emotionalism; too often they are reminiscent of the symptoms described by Brennan¹² in the latent beriberi seen in the Philippines. The same is true of his easy fatigue, palpitation and insomnia. Likewise, I think it fair to assume that his vague digestive disorders, even though they depend on functional derangement rather than on structural damage, are none the less genuine. When one recalls the description by Cowgill and Gilman¹³ of the depression of gastric secretory activity produced by lack of the vitamin B complex, and that of Shimazono¹⁴ of the altered intestinal motility which accompanies the same deficiency, it is not difficult to recognize the true nature of these disabilities.

The patients of whom I speak have been put to bed in the hospital, reassured, given a pat on the back, and forced to eat a liberal, well balanced diet, a type of diet to which, as a rule, they were utterly unaccustomed and against which they sometimes rebelled. In the majority of instances the improvement has been thoroughly satisfactory. The aches and pains have

disappeared, foods were eaten that formerly were regarded with great fear, emotional stability has been established, and the patient has not infrequently blossomed out like a rose. He was cured, at least for the time being, but of what he was cured I formerly had many doubts. Now I believe I know. It was not, as was at first thought, the seclusion, the opportunity for quiet contemplation, the reassurance, the atmosphere of encouragement or the pat on the back that accomplished the cure. It was food.

High in the list of such disorders should be placed the so-called prepellagrous state. Since J. B. McLester in his study of the histories of pellagrins seen at the Hillman Hospital in Birmingham made the significant discovery that an appreciable number of these patients had been admitted the previous year under the diagnosis of neurasthenia, we have made an effort toward the early recognition of such cases of subclinical pellagra. Many of the patients recently studied could with some justice be called neurasthenic, but when given nicotinic acid and thiamin, with a diet appropriate for pellagra, they recovered their nervous stability and sense of well-being to a remarkable degree. I believe that with a good history the prepellagrous state can be recognized without great difficulty and further progress of the disease stopped.

Among the discoveries made by Spies and his associates in these pellagra studies two are deserving of mention here. First, abundant confirmation was found of the belief which I expressed a few years ago^{14a} that the deficiency responsible for the manifestations of this disease is as a rule multiple in nature. Nicotinic acid will relieve in a graphic manner the psychic and the gastrointestinal symptoms of pellagra, but experience has shown that vitamin B₁ is required for relief of the neuritis. Second, it was demonstrated early in this work that a diet fully adequate to protect against pellagra will not necessarily arrest the disease once it is started; the same nutritive substances are required but in greatly increased amounts. The conclusions drawn from these observations apply, experience has led me to believe, not only to pellagra but also to many other deficiency states, borderline and outspoken.

The minor disorders that appear in the twilight zone of nutritive failure are many and varied. In this group can be placed the normocytic anemia, with a slightly macrocytic tendency, ascribed by Minot¹⁵ to lack of vitamin C and the iron deficiency anemia seen among many young women. This last, although mild, is apparently identical with the chlorosis frequently described forty years ago. In the same category belong the dermatoses of minor extent described by Youmans and Corlette¹⁶ and others and the peculiar dystrophy of the nails reported by White. In the first group improvement was effected by the administration of vitamin A and in the second by vitamins A, B and D. I am not familiar with the beriberi heart described by Weiss and Wilkins,¹⁷ but I believe that other disorders which accompany low grade vitamin B₁ deficiency, difficult of accurate appraisal, are

11. Minot, G. R.: Nutritional Deficiency, *Ann. Int. Med.* 12: 429 (Oct.) 1938.

12. Brennan, T. J.: The Early Diagnosis of Beriberi, *Nutrition Abstr. & Rev.* 2: 841 (April) 1933.

13. Cowgill, G. R., and Gilman, Alfred: Physiology of Vitamins: XXIII. The Effect of Lack of the Vitamin B Complex on the Secretion of Gastric Juice in Dogs with Gastric Pouches, *Arch. Int. Med.* 53: 58 (Jan.) 1934.

14. Shimazono, J., quoted by Cowgill, G. R.: The Vitamin B Requirements of Man, Yale University Press, 1934.

14a. McLester, James S.: The Nature of Pellagra: A Critique, *Ann. Int. Med.* 8: 475 (Oct.) 1934.

15. Minot, G. R.: The Anemias of Nutritional Deficiency, *J. A. M. A.* 105: 1176 (Oct. 12) 1935.

16. Youmans, J. B., and Corlette, M. B.: Specific Dermatoses Due to Vitamin A Deficiency, *Am. J. M. Sc.* 195: 644 (May) 1938.

17. Weiss, Soma, and Wilkins, R. W.: The Nature of the Cardiovascular Disturbances in Nutritional Deficiency States (Beriberi), *Ann. Int. Med.* 11: 140 (July) 1937; Disturbances of the Cardiovascular System in Nutritional Deficiency, *J. A. M. A.* 109: 786 (Sept.) 1937.

of relative frequency. Among these should be included many so-called functional digestive disorders with anorexia and loss of gastrointestinal muscle tone, and many forms of neuritis, both single and multiple. Witness the neuritis of pregnancy which Strauss and McDonald¹⁸ successfully treated with abundant diets rich in vitamin B₁, and the neuritis of diabetes mellitus, which Williams and Spies^a believe is due to vitamin B₁ deficiency.

Other disorders, the nature of which is sometimes difficult of recognition, accompany low grade protein starvation. This deficiency does not always produce effects as outspoken as the nutritive edema and other evidences of faulty diet described by Yonmans in the mountains of Tennessee. Less obvious symptoms such as weakness, pallor and the pitting of the ankles and puffiness of the eyelids that follow long continued illnesses may result from lack of protein. In this group should be placed also the toxemias of pregnancy which Strauss¹⁹ has shown to be due to hypoproteinemia, and certain of the hypochromic anemias. A large proportion of the circulating protein is included in the hemoglobin molecule, and without a sufficient supply of this foodstuff hemoglobin is inadequately produced. Evidence of this is seen in the experiments of Weech and his associates,²⁰ whose dogs, maintained on a diet deficient in protein, experienced a marked fall in red blood cells as well as depletion of circulating proteins. This explains why hypochromic anemia is sometimes so refractory to treatment. Lack of protein is far reaching in its effects.

The relationship of inadequate diet to disease is not always direct. It would take a stretch of the imagination to regard cirrhosis of the liver as a deficiency disorder, yet Connor²¹ looks on starvation or partial starvation, plus alcohol, as first among the causes of this disease. He lists the several types of faulty diet which prepare the way and doubts whether the adequately nourished person, even though he uses alcohol to excess, ever develops cirrhosis. Even cataract has been brought into this category. Bourne²² suggests, since the lens is a growing tissue and since relatively large amounts of essential amino acids are required for the elaboration of its protein, that this structure is in all likelihood susceptible to protein deficiency. A similar influence is attributed to vitamin C, which is normally present in the lens. Since the amount of ascorbic acid is less in the lenses of older animals and least of all in cataractous lenses, and since ascorbic acid is so intimately concerned in the metabolism of this structure, it is thought that its withdrawal will produce degenerative changes. Because of the low ascorbic acid levels reported in the blood of rheumatoid diseases²³ arthritis is also included in this group. Such examples cannot be regarded as final evidence of a

directly causative relationship, but they illustrate nonetheless the fact that diseases which apparently are of other origin may develop on a basis of nutritive deficiency.

The chronic undernutrition which leads to the disorders just discussed is far reaching in its effects and sometimes difficult of correction. Witness the experiments of French and Bloomfield,²⁴ who demonstrated that rats which have lost weight as the result of a defective diet and then have been restored to normal by a stock ration subsequently show more rapid weight loss when again placed on the same defective diet, which is taken to indicate that there has been some real alteration in the status of the animal. This principle is probably applicable to man also, for it is well established that long continued undernutrition will lead to general physical inferiority, small stature, skeletal defects and even intellectual retardation. That nutritive failure during the formative period of life if long continued may result in damage which can never again be completely corrected is evident in the small stature and mental and physical inferiority of children reared in undernourished families.²⁵ Continued into adult life, such deficiencies may also lead to early decay, as was seen in the experiments of McCollum, who found that mice reared on a diet within the "twilight zone" of good nutrition exhibit relatively early the signs of senility and fail to live out their normal span of life. Other animals show the same tendency; man is probably no exception.

ILLUSTRATIVE CASES

In closing I would like to tell of a few patients who have suffered from the deficiency states I have attempted to describe and then speak briefly of treatment. A patient whose gallbladder had been removed was having a stormy convalescence. She could not be induced to eat, was prostrated far beyond what could reasonably be expected, and was apparently developing a psychosis. In view of her "finicky" appetite and of her history of never having eaten properly since childhood, she was finally given nicotinic acid and daily intramuscular injections of liberal amounts of liver extract. The result was graphic. The psychoneurosis disappeared, she began to eat, and convalescence ensued. The starvation incident to the illness and subsequent operation had simply pushed a borderline deficiency over the border.

Another patient's diagnosis varied from time to time between inadequate personality, constitutional inferiority and neurasthenia. In addition to his numerous bodily complaints he was utterly lacking in stamina. He experienced frequent emotional upsets and could work only a few days at a time; even then he was thoroughly inefficient. Finally, because of the similarity between this young man's complaints and those of many early pellagrins, he was given, in addition to an abundant diet, nicotinic acid. There was immediate improvement. He returned to work and continued to work steadily. Because, no doubt, of damage done to his nervous system many years ago, the original diagnosis of constitutional inferiority still holds good, but since he has taken nicotinic acid his difficulties have largely disappeared.

18. Strauss, M. B., and McDonald, W. J.: Polyneuritis of Pregnancy: A Dietary Deficiency Disorder, *J. A. M. A.* **100**: 1320 (April 29) 1933.

19. Strauss, M. B.: Nutritional Deficiency and Water Retention in the Toxemias of Pregnancy, *J. Clin. Investigation* **14**: 710 (Sept.) 1935; Observations on the Etiology of the Toxemias of Pregnancy, *Am. J. M. Sc.* **194**: 772 (Dec.) 1937.

20. Weech, A. A.; Wollstein, M., and Goettsch, E.: Nutritional Edema in the Dog, *J. Clin. Investigation* **16**: 719 (Sept.) 1937.

21. Connor, C. L.: The Etiology and Pathogenesis of Alcoholic Cirrhosis of the Liver, *J. A. M. A.* **112**: 387 (Feb. 4) 1939.

22. Bourne, M. C.: Metabolic Factors in Cataract Production, *Physiol. Rev.* **17**: 1 (Jan.) 1937.

23. Rinehart, J. F.; Greenberg, L. D.; Baker, Frances; Mettler, S. R.; Brukman, F., and Choy, Frank: Metabolism of Vitamin C in Rheumatoid Arthritis, *Arch. Int. Med.* **61**: 537 (April) 1938. Rinehart, J. F.; Greenberg, L. D.; Olney, Mary, and Choy, Frank: Metabolism of Vitamin C in Rheumatic Fever, *ibid.* **61**: 552 (April) 1938.

24. French, L. R., and Bloomfield, A. L.: "Latent Deficiency" in Rats, *J. Nutrition* **14**: 117 (Aug. 10) 1937.

25. Richards, M. B.: Role of Vitamin A in Nutrition, *Brit. M. J.* **1**: 99 (Jan. 19) 1935.

Vallebona¹⁸ reported a cure in one case but failure in four other cases. Cignolini¹² failed in seven cases to effect recovery. Lezius,²⁰ in a monograph published in 1936, said that he had observed no healing of abscesses after short wave therapy. One of his patients died of hemorrhage immediately after irradiation and a second two weeks later from extensive new areas of destruction of lung tissue. In a paper on the treatment of gangrene of the lung written from the Heidelberg surgical clinic,



Fig. 1 (case 1, June 21, 1935).—Large shadow involving nearly one half of the entire right lung field (which has a circular outline in the oblique position). No fluid level was visible. Diagnosis: large lung abscess.

Lezius¹⁹ said "We had very poor results with roentgen and short wave irradiation of the lung" (Ganz schlechte Erfahrungen machten wir mit Roentgen- und Kurzwellenbestrahlung der Lunge). In ten cases Jacchia and Ghetti²¹ failed to obtain a cure, but in four they claimed complete recovery. Vosschulte and Schwarzhoff²² in a recent paper stated that they had operated in two cases in which short wave

therapy had been employed for a long time without any success.

We have collected from the literature 129 cases of lung abscess and gangrene treated with short waves by eighteen clinicians, as shown in the accompanying table. Eighty-seven of the patients, or 67 per cent, were reported to be cured.

The following series has been carefully studied. The patients with two exceptions were hospitalized during the course of therapy. This made possible a careful observation of temperature, pulse, physical signs, sputum and blood sedimentation rate. Roentgenograms were made at frequent intervals. Schliephake's original recommendations regarding technic were carefully followed.

Treatments were usually given daily, beginning with an initial one of ten minutes' duration. The duration was gradually increased to thirty or even forty-five minutes. Large glass electrodes 20 cm. in diameter were used. They were usually placed from 4 to 6 cm. from the skin. The wavelengths selected were 4 cm. or 6 cm. A large two vacuum tube machine was used. It has an output of 500 watts when generating a 6 meter length.

During the first treatments increased expectoration was often noticed. In one case treatment was discontinued for three days owing to the presence of blood in the sputum. The treatments did not disturb the patients after they became accustomed to the procedure.

ACUTE LUNG ABSCESS

CASE 1.—*History and Course.*—M. H., a girl aged 10 years, had had a tonsillectomy April 27, 1935, and pain in the right

20. Lezius, Albert: *Der Lungenabscess*, *Ergebn. d. Chir. u. Orthop.* 29: 571, 1936.

21. Jacchia and Ghetti: *Treatment of Lung Abscess with Short Wave Therapy*, *Gior. med. d. Alto Adige* 8: 1938; *abstr.*, *Med. Klin.* 34: 483 (April 8) 1938.

22. Vosschulte, K., and Schwarzhoff, E.: *Spontanheilung, interne Behandlung und Indikation zum chirurgischen Eingriff beim Lungenabscess*, *München. med. Wchnschr.* 85: 580 (April 12) 1938.

side of the chest June 6. Later fever and cough developed, with foul sputum. On her admission to the Boston Floating Hospital June 20 there were dullness and diminished breath sounds on the right side of the chest. X-ray examination showed evidence of a lung abscess (fig. 1). The temperature varied between 101 and 103 F. and the pulse was accelerated. The total amount of sputum was from 20 to 80 Gm. daily. July 1 short wave treatment was begun. Three days later the temperature fell to normal. July 6 the physical signs had disappeared. The blood sedimentation rate dropped from 55 mm. in one hour July 1 to 22 mm. July 16. No further determination was made until December 3, when it was 4 mm. in one hour. July 11 a roentgenogram showed clearing of the infiltration, but the cavity was unchanged (fig. 2). During the following month it shrank until measured only 2 cm. by 1 cm. In a roentgenogram made August 23 the abscess was no longer visible (fig. 3). There was a gain in weight, and the patient seemed to make a complete recovery except for the persistence of a small cavity, as shown by later roentgenograms. The last short wave treatment was given Feb. 12, 1936. She returned to the Children's Clinic on request from time to time. March 14 a note was made that she was going to school and feeling well and that there was no cough or expectoration. She remained free from symptoms until September, when there developed a cough, which persisted. When she was seen October 31 her temperature was 101.2 F. The sputum was purulent and of foul odor. There were dullness and bronchial breathing over the lower part of the right lung. A roentgenogram revealed an abscess involving the entire middle lobe (fig. 4). November 5 she was sent to the Massachusetts Memorial Hospitals with a temperature of 101 F. There the abscess was drained in a three stage procedure. At operation it was found to involve the entire middle lobe. During the following months the patient slowly recovered, and she was discharged April 26, 1937, with a small sinus still present.

Therapy.—A 4 meter wavelength was used with large electrodes 3 cm. from the skin. Treatments were given daily, lasting from ten to forty-five minutes. The total number of treatments was 113 and they extended from July 1, 1935, to Feb. 12, 1936.

This case seemed to be a striking demonstration of the curative value of short wave therapy in lung

abscess. The symptoms rapidly disappeared, but a small cavity persisted in spite of 113 short wave treatments given over a period of more than six months. The patient remained clinically well for over a year. Then symptoms returned, the abscess enlarged and surgical treatment was necessary. The case teaches that a lung abscess is not cured until the cavity is closed and replaced by scar tissue.

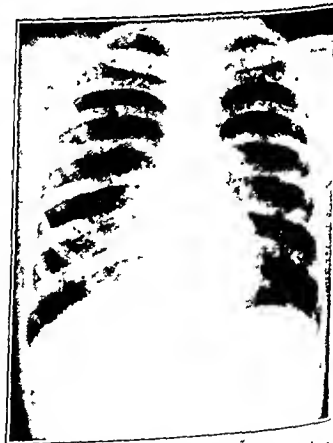


Fig. 2 (case 1, July 19).—Nineteen days after short wave treatments were begun the shadow was reduced in size, but there was a large cavity in the lung with a fluid level clearly visible.

CASE 2.—*History.*—A. G., a single woman aged 29, had a tonsillectomy April 7, 1938, and nine days later, April 16, there was a sudden rise of temperature with chill and cough. From the onset until admission to the Diagnostic Hospital of the New England Medical Center April 21 the temperature ranged from 100 to 102 F. and there had been severe pain in the lower right lateral region of the chest, with increasing cough and sputum amounting to as much as 100 Gm. daily. On two occasions it had a foul odor and taste. On admission the patient appeared acutely ill. There was an almost eco-

tinuous cough, with choking attacks and the expectoration of foul-smelling sputum. There was slight dulness over the lower part of the right lung posteriorly. In this area a few moist rales were present. The sputum contained a few spirochetes, fusiform bacilli and many elastic fibers. No tubercle bacilli were found. Roentgenograms April 21 showed an area of homogeneous density in the mid third of the right lung in which a fluid level was seen. May 5, fourteen days after admission, the cavity appeared much larger. The clinical course was marked by continuous fever during the first nine days. On



Fig. 3 (case 1, August 23).—The abscess cavity can no longer be discerned. It is apparently replaced by dense tissue.

the ninth day the patient coughed up 717 Gm. of sputum in twenty-four hours. After this the amount of sputum ranged between 100 and 200 Gm. The temperature was unchanged. The blood sedimentation rate remained the same. It was 24 mm. in one hour April 22 and also May 5.

The patient received either 0.1 Gm. or 0.05 Gm. of neoarsphenamine on three occasions. This treatment was discontinued on account of a marked reaction after the third treatment.

Therapy.—Daily treatments were given except for the four days from April 27 to May 2. A 6 meter wavelength was used with large electrodes, each placed 6 cm. from the skin. The duration of the single treatments was from five to fifteen minutes. Severe paroxysms of coughing, together with the weakened condition, made treatments longer than fifteen minutes inadvisable. The total number of treatments was eight.

Course.—There was no change in the clinical picture, but there was a definite increase in the size of the cavity. Therefore the patient was transferred to the New England Deaconess Hospital, where a large abscess cavity was found and drained by Dr. Overholt. She made a good recovery.

In this case of lung abscess following tonsillectomy, short wave therapy was given over a rather short period, but as the patient's symptoms were not diminished and as the abscess increased in size it seemed proper to resort to surgical treatment. In view of the small number of treatments given one might not be justified in recording this case as a failure of short wave therapy. On the other hand, eight treatments given in two weeks failed to produce the slightest amelioration of the symptoms.

CHRONIC LUNG ABSCESS

CASE 3.—**History.**—G. B., a housewife aged 35, had pneumonia of the lower lobe of the right lung in 1928 and since then had raised from 20 to 30 Gm. of sputum daily. Between 1929 and 1932 several hemoptyses occurred. For the past few years she had felt fairly well and had been able to do a moderate amount of housework. On examination Sept. 19, 1935, slight pallor was noted. There was flatness over the right side of the chest; here a few sibilant and consonating rales were heard. No tubercle bacilli or elastic tissue could be found in the sputum. The sedimentation rate was 17 mm. in one hour. There was no anemia. Roentgenograms showed a faint triangular shadow in the middle of the right lung, which was interpreted as due to an abscess. During the following days the sputum averaged 50 Gm. The hemoglobin content was 89 per cent and the red cell count 4.7 million per cubic millimeter. The temperature was normal. Bronchoscopic examination supported the diagnosis of abscess of the lung.

Therapy.—Radiation with a 4 meter wave was given daily for from fifteen to forty minutes with electrodes 20 cm. in diameter placed 4 cm. from the skin.

Course.—Treatment was continued from September 23 to December 23, when she was discharged. The results of x-ray examination remained unchanged, and when she left the hospital she was raising from 30 to 48 Gm. of mucopurulent odorless sputum daily.

This patient had a very chronic and benign form of lung abscess. There was no improvement, although short wave treatment was given for three months.

CASE 4.—**History.**—R. H., a business man aged 56, had a febrile pulmonary infection in December 1933 following exposure to cold. A roentgenogram of the chest in June 1934 showed changes suggestive of bronchopneumonia. Cough had persisted since then. In September 1934 an x-ray examination revealed an abscess in the lower lobe of the left lung, as did one done in April 1935. On admission June 6, 1935, he stated that the cough and sputum had increased during the previous three weeks and that the sputum was purulent. There was dulness over the lower lobe of the left lung. Occasional medium and coarse rales were heard over this region. The temperature during the stay in the hospital did not rise above 99.6 F.; the average pulse rate was 95. The blood sedimentation rate was 6 mm. in one hour (Westergren). A blood count showed 7,100 leukocytes and 5.2 million erythrocytes per cubic millimeter and a hemoglobin content of 100 per cent. The sputum amounted to between 12 and 60 Gm. in twenty-four hours; there were many elastic fibers in one specimen but no tubercle bacilli. X-ray examination revealed in the eighth intercostal space of the left lung a definite round shadow 3 cm. in diameter apparently half filled with fluid.

Therapy.—Thirty-four treatments were given, a 4 meter wavelength being used. Large electrodes were placed 4 cm. from the skin of the chest. For the first fortnight a short wave treatment was given daily, and then a treatment was omitted two or three times a week.

Course.—No improvement in the patient's general condition was noticed. A roentgenogram made at the end of treatment showed no change in the size or the appearance of the abscess.

This case represents a benign form of a well encapsulated abscess without signs of activity. Despite prolonged treatment there was no change in the size of the abscess.

CASE 5.—**History.**—H. R., a boy aged 9 years, swallowed a blade of grass Oct. 4, 1935, and apparently had pneumonia one week later. Subsequently a diagnosis of lung abscess was made and confirmed by x-ray examination. In January 1936 he was placed in a hospital outside

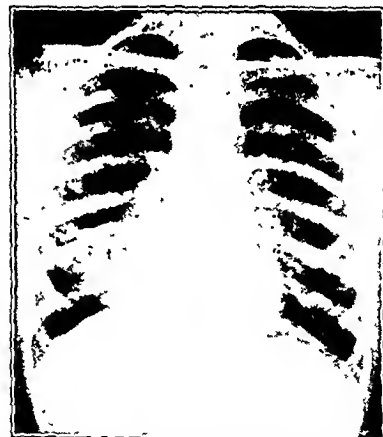


Fig. 4 (case 1, Nov. 5, 1936).—The cavity, with a fluid level, is larger than in July 1935.

Boston, where aspiration of the abscess was attempted. Empyema then developed. Two ribs were resected and 500 cc. of pus removed. Improvement followed and the temperature fell to normal. He was admitted to the Diagnostic Hospital of the New England Medical Center February 17. He was pale and undernourished, and there was a foul odor to the breath. There was a draining sinus in the right lower part of the chest, with dulness on percussion over this part and diminished breath sounds. The hemoglobin content was 70 per cent, the leukocytes numbered 17,200 per cubic millimeter and the sedimentation rate was 50 mm. in one hour. The sputum contained no acid-fast

bacilli or elastic fibers and varied in amount from 60 to 120 Gm. X-ray examination revealed a marked infiltration of the lower lobe of the right lung with an ill defined lower margin and a curved outline of the upper margin. He was in the hospital nearly two months and had a mild fever throughout his stay. The average pulse rate was 100.

Therapy.—Daily irradiation was performed with a wavelength of 4 meters and large electrodes placed about 3 cm. from the skin. The total number of treatments was forty-two.

Course.—There was no change in the amount of sputum, temperature or general condition during his stay at the hospital. He was transferred to the Massachusetts Memorial Hospitals, where lobectomy was attempted July 17. He did not survive the operation.

This was a case of severe lung abscess due to a foreign body. The condition did not respond to short wave therapy.

CASE 6.—History.—E. Y., a machine tender aged 21, who showed the first signs of pulmonary involvement in April 1936, when he began to cough and raise blood-streaked sputum, was under observation in the Diagnostic Hospital from June 2 to June 25. There was dullness over the right side of the chest. Diminished breath sounds and moist rales were present over the entire right lung. The leukocytes numbered 28,200 per cubic millimeter. The blood sedimentation rate was 52 mm. in one hour. X-ray examination showed a large area of infiltration in the upper lobe of the right lung with areas suggestive of destruction of lung tissue. During his first stay in the hospital the infiltration lessened and the sputum decreased from 100 to 25 Gm. A roentgenogram taken on discharge showed remarkable regression of the infiltration, but a definite area of softening had developed. He improved for a time. On August 9 cough returned, and he was readmitted August 16. The sputum had increased in amount and had developed a foul odor. It amounted to between 30 and 50 Gm. in twenty-four hours. Only a single elastic fiber was found in the sputum; there were no tubercle bacilli. The temperature varied from normal to 103 F. X-ray examination August 20 showed an infiltration involving two thirds of the upper lobe of the right lung with a questionable fluid level.

Therapy.—Radiation with a 6 meter wavelength was given daily for nine days for from fifteen to thirty minutes, large electrodes placed 4 cm. from the skin being used.

Course.—The temperature fell somewhat after a few days but later rose again. X-ray examination September 14 showed extension of the infiltration toward the base with a fluid level present. The patient was transferred to the Massachusetts Memorial Hospitals, where September 19 operation (drainage of two lung abscesses and resection of three ribs) was performed. He died October 6. Autopsy revealed multiple abscesses in the lower lobe of the left lung.

This patient when treated was in a toxic condition. He was in no way benefited by short wave treatments and finally died in spite of operation.

CASE 7.—History.—F. R., an Italian shoemaker aged 44, became ill Feb. 12, 1937, when fever, cough and headache developed. X-ray examination four weeks later showed an isolated abscess with a fluid level in the lower lobe of the left lung. Operation was advised in October but refused. Later cough, expectoration and loss of weight became more pronounced. The patient entered the Diagnostic Hospital November 17. He showed signs of chronic infection and pallor and coughed frequently. He weighed 98 pounds (44 Kg.). The temperature was 100 F., the respiratory rate 36 and the pulse rate 88. There were slight dullness over the lower lobe of the left lung and a slight decrease in the tactile fremitus over the base of the left lung, where numerous moist rales were heard after coughing. A blood count showed 14,500 leukocytes and 4.5 million erythrocytes per cubic millimeter and a hemoglobin content of 65 per cent. The sedimentation rate was 78 mm. in one hour (Westergren method). The sputum ranged

in amount from 160 to 460 Gm. in twenty-four hours and had a foul odor; no spirochetes were found. X-ray examination on admission showed a dense shadow over the lower lobe of the left lung.

Therapy.—The patient was given thirty-six treatments with a 6 meter wavelength for twenty minutes daily from November 19 to January 6, except on Sundays and holidays. The electrodes were 20 cm. in diameter and were placed 4 cm. from the skin of the left lower part of the chest.

Course.—The temperature varied between 100 and 102 F. and the respiratory rate between 30 and 36. The pulse remained accelerated. There was a slight increase in weight but no change in general condition of the results of x-ray examination. December 27 the sedimentation rate had risen to 127 mm. in an hour.

The patient was transferred to the surgical department of the Peter Bent Brigham Hospital, where he died after drainage was performed. An autopsy revealed multiple abscesses in the left lung.

In this case progressive multiple abscess formation was not influenced by short wave therapy.

CASE 8.—History.—J. B., a man aged 22, who in March 1937, on the ninth day after an appendectomy, was seized with a shaking chill followed by a severe cough and high fever, the following day raised fetid sputum. A week later an x-ray examination showed an infiltration of the upper lobe of the left lung. Cough and fever continued, and about 30 Gm. of foul sputum was raised daily. He lost 20 pounds (9 Kg.). During the summer the symptoms gradually disappeared. Through the fall and early winter he was fairly well and regained 20 pounds. In February 1938, three weeks before admission, he was seized with cough, pain in the right upper part of the chest and fever. The fever persisted for a week. On admission, March 30, his weight was slightly diminished, his general condition was fair, there was no anemia and he had moderate cough. A few sibilant rales were heard over the base of the left lung; otherwise the physical examination gave negative results. A roentgenogram of the chest showed two cavities in the apex of the lower lobe of the left lung. The sputum contained many elastic fibers but no tubercle bacilli or spirochetes.

Therapy.—Daily short wave treatments for from ten to twenty minutes with a 6 meter wavelength were given. Large electrodes were used over the lower lobe of the left lung at a distance of 10 cm. in front and 4 cm. in back. The total number of treatments was nineteen.

Course.—During hospitalization he remained afebrile except for five days (April 18-April 23), when he had an increase of sputum, headache and a rise of temperature to 102 F. The sputum ranged in amount from 75 to 250 Gm. daily, contained a little blood occasionally and had a fetid odor. There was no improvement in the results of examination on discharge. He was transferred to the New England Deaconess Hospital, where Dr. Overholt did a three stage drainage of the lung abscesses. He made a good recovery.

Chronic abscesses in the lower lobe of the left lung causing relatively mild symptoms were uninfluenced by short wave therapy.

COMMENT

We have published our results because we believe they indicate clearly that short wave therapy is of far less value in the treatment of lung abscess than the advocates of this method claim. We are especially doubtful of the possibility of curing chronic abscesses with short waves. There is a certain danger, as recently pointed out by Vosschulte and Schwarzhoff,²² that patients may be lost by persistence in conservative treatment who might be saved by surgical intervention. Whether or not short wave therapy will cure acute lung abscesses is still undecided. As an analysis of the

reported cases shows that eighty-five of 128 patients with lung abscess, or 66 per cent, recovered, the evidence is clear that a further trial of this method should be made with patients seen early in the disease before surgical intervention is resorted to. We have used throughout the most powerful apparatus of European manufacture, identical with the best equipment employed by those who have reported cures, large Schliephake electrodes, and have given daily treatments of the same duration as those by others who have had success. Dieker,¹¹ using exactly the same technic that we employed in most of our cases, a large output of energy, a wavelength of 6 meters and a distance from the skin of at least 4 cm., reported fifteen recoveries in sixteen cases. The only reasonable change we can make in technic is to increase the distance of the electrodes from the chest. In view of the experience of Liebesny⁸ and others we shall use in the future an air gap between the electrode and the skin of 10 cm.

SUMMARY

In two cases of acute and in six cases of chronic abscess of the lung, short wave therapy was not successful in effecting a cure.

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BILE SALT SOLUTIONS IN INFECTIONS
WITH BETA HEMOLYTIC
STREPTOCOCCITHEIR THERAPEUTIC AND PROPHYLACTIC
PROPERTIES

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AND

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CINCINNATI

Hilgermann¹ has advocated parenteral administration of small amounts of sodium taurocholate as an effective prophylactic and therapeutic measure in treating infections caused by beta hemolytic streptococci. He offered the following theoretical basis for its use: Injection of small quantities of sodium taurocholate brings about death and solution of small numbers of streptococci, from which antigenic substances are liberated; these antigens induce an active immunity to the invading organism by stimulating formation of protective antibodies. No convincing evidence was offered to support this theory. Hilgermann's experiments with mice were preliminary and meagerly detailed; Stoeckel's² more complete work only partially supported Hilgermann's claims. The results of the clinical use of sodium taurocholate³ were suggestive but not at all conclusive, owing principally to the lack of extensive bacteriologic data but also to the use of other forms of treatment along with the bile salt therapy.

Our attention was brought to the status of this problem by the late Dr. John E. Greive, who had obtained a supply of Hilgermann's bile salt preparation (prepared by Sehering-Kahlbaum). Greive had used this material clinically without success. This clinical failure and the obvious theoretical objections to the use of any bile salt preparation for this purpose suggested the need of more extensive experimental work than Hilgermann had reported.

We have performed both prophylactic and therapeutic experiments with mice, using (1) Hilgermann's preparation and (2) a solution prepared in our own laboratory containing sodium taurocholate and sodium deoxycholate. These solutions were tested against infections produced with different strains of beta hemolytic streptococci. Our results have been uniformly negative; in every experiment, regardless of the amount of the therapeutic agent administered or the time or mode of administration, the treated animals have died as rapidly as the controls.

EXPERIMENTS

Therapeutic Solutions.—Hilgermann has never given the exact composition of his sodium taurocholate solution, either in publications or in communications to Greive. It is said to be a dilute solution of sodium taurocholate in a special buffer, the nature of which is not disclosed. Qualitative examination gave the following results: The solution gave a very weak Pettenkofer reaction and a negative Gregory-Pascoe reaction. Unless the buffer inhibited the ordinary reactions of sodium taurocholate, this observation indicates that if a bile salt is present it is more likely a derivative of deoxycholic acid than of cholic acid. Alkaline hydrolysis liberated aminonitrogen equivalent to that contained in a 0.44 per cent solution of sodium taurodeoxycholate. Sulfur was present. The solution had a pH of 8.2 and contained 0.6 per cent of phenol.

The solution prepared in our laboratory contained 0.5 per cent sodium taurocholate, 0.05 per cent sodium deoxycholate and 0.5 per cent phenol, all in tenth molar aminoacetic acid buffer at pH 8.2.

Administration: The solutions were injected, both subcutaneously and intraperitoneally, in amounts varying from 0.5 cc. of the undiluted solutions to 0.5 cc. of 1:10,000 dilutions. When used prophylactically these amounts were injected forty-eight, twenty-four and twelve hours prior to infection. When they were used therapeutically, some groups of animals were treated immediately and others two and four hours after infection.

Streptococci.—Five strains of beta hemolytic streptococci were studied. Two, Schw and C203, were supplied by Dr. Perrin H. Long of Johns Hopkins University; these were highly virulent for mice, 10^{-8} cc. of a sixteen hour blood broth culture killing mice within forty-eight hours. The other three strains were freshly isolated from human beings and passed through numerous mice until maximum virulence was obtained; two were as virulent as Schw and C203; the third was of low virulence, 10^{-4} cc. of a sixteen hour culture being required to kill a mouse. In our experiments all mice were infected intraperitoneally with ten minimum lethal doses of the streptococci.

From the Christ Hospital Research Institute.

1. Hilgermann, Robert: Die Chemotherapie der Streptokokkeninfektion, München, med. Wchnschr. 77: 1970-1971 (Nov. 14) 1930; Chemotherapie mit gallensauren Alkalien ein sicheres Heilmittel bei Streptokokkeninfektionen, Zentralbl. f. Gynäk. 60: 1090-1096 (May 9) 1936; Chemotherapie und Prophylaxe der Streptokokkeninfektion mittels gallensauren Alkalien, ibid. 60: 2290-2294 (Sept. 26) 1936.

2. Stoeckel, K. H.: Tierexperimentelle Untersuchungen mit dem Chemotherapeutikum Taurin (Hilgermann), Ztschr. f. Immunitätsforsch. u. exper. Therap. 91: 285-298 (Oct. 15) 1937.

3. Schäfer, Günther: Die Erfolge der Chemotherapie mit gallensauren Alkalien bei Puerperalfieber und bei gynäkologischen Streptokokkeninfektionen, Zentralbl. f. Gynäk. 60: 1096-1107 (May 9) 1936.

RESULTS

The results of a typical experiment, that with C203, are shown in the accompanying table. Our results have been entirely negative; neither Hilgermann's preparation nor our own possessed prophylactic or therapeutic properties.

This observation is contrary to those reported by Hilgermann and Stoeckel. A comparison of our work with Hilgermann's is impossible, since he has not presented any experimental data. Stoeckel used a beta hemolytic streptococcus of low virulence; his control mice infected with 10⁻¹ cc. of a twenty-four hour broth culture survived for three days. Three of seven mice infected with 0.1 cc. of that culture and treated with 0.5 cc. of 1:100,000 and 1:1,000,000 dilutions of Hilgermann's preparation survived; mice treated with 0.5 cc. of a 1:10,000 dilution died, as did the controls.

Effects of Prophylactic and Therapeutic Treatment on the Survival Time of Mice Infected with Beta Hemolytic Streptococci (C203)

No. of Mice in Group	Time of Administration	Solution Adminis-tered*	Amount Injected (Cc.)	Average Survival Time (Hours)
6	48 hours prior to infection.....	H	0.5	40
6		S and R	0.5	43
6	24 hours prior to infection.....	H	0.5	41
6		S and R	0.5	41
6	12 hours prior to infection.....	H	0.5	42
10	Controls.....	None	0.0	43
6	On infection.....	H	0.5	44
6	On infection.....	S and R	0.5	46
6	On infection.....	H	0.5 × 10 ⁻¹	41
6	On infection.....	S and R	0.5 × 10 ⁻¹	43
10	Controls.....	None	...	47
10	On infection.....	H	0.5 × 10 ⁻²	41
10	On infection.....	H	0.5 × 10 ⁻⁴	42
10	On infection.....	H	0.5 × 10 ⁻⁵	41
10	On infection.....	H	0.5 × 10 ⁻⁶	42
10	On infection.....	H	0.5 × 10 ⁻⁷	42
10	Controls.....	None	...	43

* "H" refers to the Schering-Kahlbaum preparation; "S and R," to the Schmidt and Remsen preparation. Prophylactic and therapeutic injections were made subcutaneously into mice infected intraperitoneally with 10⁻⁷ cc. of sixteen hour blood broth culture.

This observation would indicate that the effective dose of sodium taurocholate is infinitesimal, not more than 0.00005 mg. per mouse. It is difficult to explain Stoeckel's results, but it is to be noted that he used only sixteen mice in his entire experiment and that of the treated animals only three of thirteen survived.

Theoretically it seems improbable that bile salt solutions such as Hilgermann's could have curative or prophylactic properties in streptococcic infections. It is well known that hemolytic streptococci are slightly if at all soluble in solutions of bile salts. Even assuming that a few strains might be bile soluble, the amounts of bile salt used would be much too small to effect solution and larger quantities would probably be toxic. In addition it must be remembered that the liver removes bile salts from the circulating blood very rapidly, and any sodium taurocholate injected would have slight opportunity of reaching streptococci in isolated lesions.

PURPURA HAEMORRHAGICA

WITH ESPECIAL REFERENCE TO PERMANENCE OF REMISSION FOLLOWING SPLENECTOMY

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AND

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BUFFALO

In 1916 Kaznelson¹ reported the first splenectomy as a therapeutic measure in a case of idiopathic purpura haemorrhagica. Since then this procedure has been carried out in hundreds of cases and has become a standard practice in many clinics all over the world. Few persons doubt the effectiveness of this form of treatment in properly selected cases not only in rehabilitating those persons who are recurrently or chronically invalidated but also in actually preserving the lives of some patients who suffer from acute hemorrhagic phenomena.

Splenectomy is still an empirical procedure, since the role of the spleen in the disease and the mechanism by which its removal causes remission are unknown. Until the fundamental nature of the condition is understood, the study of all its phases will continue to be of interest. One such phase pertains to the permanence of remissions produced by splenectomy.

One of us (T. W.) performed one of the first splenectomies, if not the first, for purpura in the western hemisphere. The case is still under observation and is presented here (case 1), together with five others in which operation was done more than ten years ago.

REPORT OF CASES

CASE 1.—This case was reported in 1923 by Bowen,² with follow-up records covering the first four months after operation.

J. S., a man aged 22, was admitted to the Buffalo General Hospital May 16, 1922. Abnormal bleeding was noticed first at the age of 4 years, after a laceration above the eye. At 5 he bled profusely when, during an attack of diphtheria, the membrane was pulled off. At 7 profuse bleeding followed adenoidectomy. At 11 he began to have jacksonian epilepsy associated with visual disturbances, localized occipital headache and partial paralysis. For the full eighteen years up to the time of hospitalization he had suffered from petechiae and ecchymoses of the skin and from epistaxis and recently he had suffered from hemorrhages from the bowel. Because of the symptoms his school life and later his work had been highly irregular. An acute exacerbation of bleeding phenomena began one week before admission.

Physical examination revealed extreme pallor, ecchymoses, old and new hemorrhages into the eye and exaggerated reflexes in the right arm. The lymph nodes and the spleen were not palpable.

Examination of the blood showed 1,648,000 erythrocytes, 18 per cent hemoglobin and 4,800 leukocytes, with 75 per cent polymorphonuclears, 18 per cent lymphocytes and 7 per cent monocytes. There were 2,500 platelets. The bleeding time was twenty minutes, the clotting time eight minutes and the clot nonretractile. Occult blood was found in the stool repeatedly.

During the interval between admission and operation (three months) he had one convulsive attack. He was given one blood transfusion, which was followed by clinical improvement. One month after admission a petechial eruption developed and the bleeding time was found to be two hours and twenty-five minutes. A few days later the spleen became palpable, and

From the Buffalo General Hospital and the University of Buffalo Medical School.

1. Kaznelson, P.: Verschwinde der hämorrhagischen Diathese bei einem Falle von essentielle Thrombopenia (Frank) nach Milzextirpation. Wien. Klin. Wochenschr. 29: 1451, 1916.
2. Bowen, B. D.: A Case of Chronic Purpura Haemorrhagica with Therapeutic Splenectomy. Bull. Buffalo General Hosp. 1: 2, 1923.

still later there was bleeding from the gums and intestine. Splenectomy was performed August 28. Convalescence was accompanied with complete cessation of bleeding symptoms, except for one mild attack of epistaxis and ecchymosis two months after operation.

A few days after being discharged from the hospital he was readmitted with an attack of "catarrhal jaundice" from which he recovered. Shortly after this he secured a position as street-car motorman, which he held without interruption for eight years. Since then he has worked continuously as maintenance

enlarged. No abnormality was found on pelvic examination to account for the bleeding.

Examination of the blood showed 820,000 erythrocytes, 23 per cent hemoglobin and 4,500 leukocytes, with 40 per cent polymorphonuclears, 58 per cent lymphocytes and 2 per cent monocytes. The bleeding time was twenty-four minutes and the clotting time one-half minute. There were 12,000 platelets, the urea nitrogen content was 29.4 mg. per hundred cubic centimeters and the serum bilirubin content was too low to estimate.

During the first ten weeks following admission she received nine blood transfusions. These were followed by subjective improvement, and bleeding from the gums and into the skin ceased. Uterine bleeding continued despite a uterine pack.

Splenectomy was performed April 10. Convalescence was uneventful except for mild uterine bleeding for five days. The patient was discharged from the hospital May 2, showing remarkable general improvement.

TABLE 1.—Results of Blood Examinations in Case 1

Date	Platelets	Bleeding Time (Minutes)	Comment
June 19, 1922.....	.....	145	
Aug. 28 .....	.....	20	Before splenectomy
Aug. 28	2,500	..	After splenectomy
Aug. 28	17,000	..	2 hours after splenectomy
Aug. 28	22,000	..	4 hours after splenectomy
Aug. 28	190,000	4	22 hours after splenectomy
Aug. 30	230,000	..	
Sept. 6	608,000	3½	
Sept. 20	307,000	..	
Sept. 29	57,000	14	
Oct. 9	96,000	6	
Oct. 15 .....	.....	..	Discharged from hospital
Nov. 3	20,000	70	Recurrence of bleeding
Nov. 11 .....	.....	..	"Catarrhal jaundice"
Nov. 20	60,000	12	No bleeding
Dec. 19	85,000	8	
Dec. 9, 1926.....	232,000	4	
Mar. 26, 1932.....	233,000	0	
Apr. 29, 1938.....	176,000	1½	

man for a real estate concern, doing various types of outdoor and indoor work, of which the major part is painting.

Reexamination April 29, 1938, almost sixteen years after operation, revealed that except for the slight attack of bleeding one month after operation he had had no hemorrhagic symptoms since the splenectomy. In 1932 he had had his tonsils removed without difficulty. There had been no convulsive seizures of any kind, and paralysis had disappeared. Occasionally he had headaches similar to those which formerly occurred with the seizures. His vision was excellent in both eyes, but he noted spots before the right eye occasionally.

He was healthy appearing and muscular. The right fundus showed several small patches of retinal atrophy. The reflexes were normal and equal in the two arms.

CASE 2.—E. M., a married white woman aged 42, was admitted to the Buffalo General Hospital Jan. 22, 1926. The present illness began in October 1924 with an attack of "shingles," followed by multiple hemorrhages from the uterus and continuous bleeding from the gums of such severity that she often awoke at night with her mouth full of blood. There

TABLE 2.—Results of Blood Examinations in Case 2

Date	Platelets	Bleeding Time (Minutes)	Hemo-globin, %	White Blood Cells	Comment
Jan. 30, 1926	12,000	24	23	4,500	
Mar. 16	24,000	5½	33	2,600	
Apr. 10	25,000	5	32	2,200	After 4 transfusions
Apr. 11	53,000	..	53	4,000	6 hours after transfusion
Apr. 12	26,000	..	42	6,000	
Apr. 13	22,000	..	35	2,400	
Apr. 14	28,000	..	34	.....
Apr. 21	43,000	..	33	4,400	

were almost daily epistaxis and the development of hemorrhagic spots in the skin varying in size from that of a pinhead to that of a pea. She lost strength and 15 pounds (6.8 Kg.) in weight. Spots appeared before her right eye and there was ringing in the ears.

She had suffered from prolonged and profuse menstrual flow since puberty. She had borne three children. Hemorrhage had followed the last delivery. The last child suffered from frequent severe attacks of epistaxis and bled abnormally after trauma.

Examination revealed emaciation and marked pallor. The skin showed generalized purpura. Bleeding points were present in the gums. The lymph nodes and the spleen were not



Patient 1 in 1938, fifteen and one-half years after splenectomy.

It has not been possible to obtain reports on the blood since she left the hospital. However, a recent report from her physician revealed the fact that there has been no marked recurrence of hemorrhagic symptoms.

CASE 3.—K. R., an unmarried white woman aged 26, admitted to the Buffalo General Hospital March 15, 1927, had always "bruised" easily. However, she was well until 1923, when her menstrual periods began to be prolonged and the flow profuse. In 1926 purpura, bleeding gums and marked increase in the menstrual flow developed. After that she complained of progressively increasing weakness and shortness of breath.

She was well developed and had marked pallor. No purpura was present. The gums bled easily on slight pressure. The lymph nodes were not enlarged and the spleen was palpable indistinctly.

Examination of the blood showed 1,600,000 erythrocytes, 27 per cent hemoglobin and 5,500 leukocytes, with 81 per cent polymorphonuclears and 19 per cent lymphocytes. There were 24,000 platelets. The bleeding time was prolonged, the clotting time normal and the clot nonretractile.

Two blood transfusions were given a week apart. There was general improvement, and except for an attack of gingival bleeding March 31 there were no hemorrhagic phenomena for about one month. However, uterine bleeding recurred. Ultra-violet irradiation had no effect on either the symptoms or the blood. Three transfusions at short intervals were followed by only slight amelioration of the bleeding.

Splenectomy was performed July 14. Except for an attack of pleurisy on the left side, convalescence was uneventful, and up to the present time there has been no single recurrence of abnormal bleeding.

TABLE 3—Results of Blood Examinations in Case 3

Date	Platelets	Bleeding Time (Minutes)	Hemo globin, %	Comment
Mar. 16, 1927	16,000	Prolonged	27	After 2 transfusions
Mar. 30	10,000	16	31	
Apr. 11	18,000		33	
July 11	65,000	Prolonged	55	After 3 transfusions After splenectomy
July 15	156,000			
July 16	369,000			
July 21	278,000		..	
Aug. 20	280,000	..	..
Sept. 25	300,000			
Mar. 22, 1932	665,000	5	73	
Jan. 18, 1936	576,000	3½	98	
May 2, 1938	460,000	3½	96	

CASE 4.—E. K., a white boy aged 3 years, admitted to the Children's Hospital July 27, 1927, had been perfectly well until May 30, when he had a spontaneous profuse nosebleed lasting an hour. The second attack occurred a week later. This was followed by numerous attacks at short intervals. At this time large ecchymoses began to appear on slight trauma. A few days before admission he had three severe attacks of epistaxis in one day. Petechiae and hemorrhages from the mouth, intestine and bladder were not observed.

Physical examination revealed marked pallor and many large ecchymoses. No nasal lesion was found that could account for the recurrent epistaxis. The lymph nodes and the spleen were not enlarged.

Examination of the blood showed 2,520,000 erythrocytes, 55 per cent hemoglobin and 15,300 leukocytes, with 72 per cent polymorphonuclears, 23 per cent lymphocytes and 5 per cent monocytes. There were 3,000 platelets. The bleeding time was ten minutes, the clotting time five minutes and the clot nonretractile.

Epistaxis continued in the hospital, and splenectomy was performed August 3. Convalescence was uneventful and he was discharged August 29.

TABLE 4.—Results of Blood Examination in Case 4

Date	Platelets	Bleeding Time (Minutes)	Hemo globin, %	White Blood Cells	Comment
July 27, 1927	3,000	10	55	15,300	Splenectomy
Aug. 3					
Aug. 4	5,000	10	..		
Aug. 6	8,000				
Aug. 8	19,000				
Aug. 10	23,000				
Aug. 12	15,000	8			
Aug. 15	11,000				
Aug. 23	None seen	..	60	15,000	
Sept. 1	22,000				
Sept. 14	32,000				
Oct. 20	377,000	3			
Apr. 12, 1928	74,000		90	11,500	
Mar. 19, 1932	267,000	1	80		
Jan. 9, 1936	164,000	4½	82	10,800	

Observations have been made at intervals after the operation and there has been no recurrence of bleeding. He is now a healthy, well developed boy of 14.

CASE 5.—J. P., a married white woman aged 30, was admitted to the Buffalo General Hospital April 9, 1928. This case was described by Kahn³ in 1932, but follow-up notes were not included in his report.

Seven years before admission she bled continuously for eight weeks after childbirth. After that menstruation became

irregular, prolonged and profuse. Severe epistaxis occurred one week before each period. Ecchymoses appeared after slight trauma. For about four months before admission these symptoms were exaggerated, and bleeding from the gums became severe. Roentgen treatment failed to control uterine bleeding.

Examination showed marked pallor, and purpuric spots were present on the left leg. The lymph nodes and the spleen were not enlarged.

Examination of the blood showed 2,330,000 erythrocytes, 25 per cent hemoglobin and 8,200 leukocytes, with 82 per cent polymorphonuclears and 18 per cent lymphocytes. There were 36,000 platelets. The bleeding time was twenty minutes and the clotting time three and one-half minutes.

The patient received one blood transfusion and other treatment to control the bleeding, with no effect. Splenectomy was performed April 17. Convalescence was stormy and complicated by pleurisy with effusion. However, all bleeding ceased, and she was discharged from the hospital May 28.

It has not been possible to obtain reports of the state of the blood since then, but at the time of writing the patient is known to be alive and well and to have had no recurrence of abnormal bleeding.

CASE 6.—J. R., a white girl aged 13, admitted to the Buffalo General Hospital April 24, 1928, had had bleeding symptoms for the first time five years previously, following scarlatina and measles. Since then there had been recurrent attacks of

TABLE 5—Results of Blood Examinations in Case 5

Date	Platelets	Bleeding Time	Hemo globin, %	White Blood Cells	Comment
Apr. 9, 1928	36,000	20 minutes	25	8,200	Splenectomy
Apr. 17					
Apr. 21	245,000				Pleurisy
May 5			50	14,800	
May 16	350,000	...		..

TABLE 6.—Results of Blood Examinations in Case 6

Date	Platelets	Bleeding Time	Hemo globin, %	White Blood Cells	Comment
May 11, 1928	20,000	Very long	45	8,000	Splenectomy
May 19	...		..
May 25	152,000				
June 6	157,000		49	..	
Mar. 4, 1932	225,000		80		
Aug. 23, 1935	240,000	2½ minutes	90		

epistaxis, bleeding gums and purpura. About one year before admission she underwent tonsillectomy and bled profusely. A short time after this her menstrual periods began; they were irregular and prolonged, and the flow was profuse.

The patient was well developed, with pronounced pallor. Petechial hemorrhages were present on the chest, abdomen and extremities. The gums were actively bleeding. The lymph nodes and the spleen were not enlarged.

Examination of the blood showed 3,580,000 erythrocytes, 45 per cent hemoglobin and 8,000 leukocytes. There were 20,000 platelets. The bleeding time was prolonged and the clotting time normal.

Preparations for splenectomy were begun at once, and after two transfusions the operation was performed May 19. Post-operative convalescence was uneventful, and there has been no recurrence of abnormal bleeding to date. Menstruation has been regular each month, each period lasting six or seven days, with light flow. The patient has led a normally active life, having finished school and undergone training as a nurse, with no loss of time because of illness.

SUMMARY AND COMMENT

In this paper we have reported the results of splenectomy in six cases of purpura haemorrhagica. The periods of postoperative observation have varied from ten to fifteen and one-half years. As far as can be determined, this group of patients has been followed longer than any group thus far reported. Only

3. Kahn, M. E.: Abnormal Uterine Bleeding in Blood Dyscrasias, J. A. M. A. 99: 1563 (Nov. 5) 1932.

